# Course: Marine Science 2- 2002520

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4348.aspx

## BASIC INFORMATION

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| **Course Title:** | Marine Science 2 |
| **Course Number:** | 2002520 |
| **Course Abbreviated Title:** | MARINE SCI 2 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Integrated Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>**Instructional Practices** Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (63)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |

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| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |

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| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and |

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| | informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and |

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| | counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and |

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| | update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |

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| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |

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| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association. |

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| | Remarks/Examples<br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.7.4:** | Summarize the conditions that contribute to the climate of a geographic area, including the relationships to lakes and oceans.<br>Remarks/Examples<br>Describe how latitude, altitude, topography, prevailing winds, proximity to large bodies of water, vegetation and ocean currents determine the climate of a geographic area. |
| **SC.912.E.7.8:** | Explain how various atmospheric, oceanic, and hydrologic conditions in Florida have influenced and can influence human behavior, both individually and collectively.<br>Remarks/Examples<br>Describe and discuss the conditions that bring about floods, droughts, wildfires, thunderstorms, hurricanes, rip currents, and tsunamis and how these conditions can influence human behavior (e.g. energy alternatives, conservation, migration, storm preparedness). |
| **SC.912.E.7.9:** | Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and |

# Course: Florida History- 2100350

**Direct link to this page:**[http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4525.aspx](http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4525.aspx)

## BASIC INFORMATION

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| **Course Title:** | Florida History |
| **Course Number:** | 2100350 |
| **Course Abbreviated Title:** | FLORIDA HIST |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Semester (S) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **Florida History** - The grade 9-12 Florida History course consists of the following content area strands: World History, American History, Geography, Humanities, Civics and Government. The primary content emphasis for this course pertains to the study of the chronological development of the state of Florida by examining the political, economic, social, military and cultural events that affected the state. Students will be exposed to the historical, geographic, political, economic, and sociological events which influenced the progression of Florida including, but not limited to, the evolution of Florida's diverse heritage through Spanish, French, British and American occupations, Florida's Native American population, United States annexation and territorial experience, statehood and an analysis of Florida's first constitution, Florida's system of slavery, Florida under the Confederacy and Reconstruction, Florida's role as a part of the new South, technological and urban transformations of the state, the evolution of Florida lifestyles and ideals over the centuries, the |

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| | historic evolution of the Florida economy, Florida's diverse geographic regions and population groups, state government, modern day Florida's successes and challenges, and the projection of Florida's future development.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices:**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (88)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| **LACC.910.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| **LACC.910.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
| **LACC.910.RH.1.3:** | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |
| **LACC.910.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| **LACC.910.RH.2.5:** | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| **LACC.910.RH.2.6:** | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| **LACC.910.RH.3.7:** | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| **LACC.910.RH.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author’s claims. |
| **LACC.910.RH.3.9:** | Compare and contrast treatments of the same topic in several primary and secondary sources. |

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| **LACC.910.RH.4.10:** | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.* |

# Course: Economics Honors- 2102320

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4515.aspx

## BASIC INFORMATION

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| **Course Title:** | Economics Honors |
| **Course Number:** | 2102320 |
| **Course Abbreviated Title:** | ECON HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** Economics |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Semester (S) |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | **Economics** - The grade 9-12 Economics course consists of the following content area strands: Economics and Geography. The primary content emphasis for this course pertains to the study of the concepts and processes of the national and international economic systems. Content should include, but is not limited to, currency, banking, and monetary policy, the fundamental concepts relevant to the major economic systems, the global market and economy, major economic theories and economists, the role and influence of the government and fiscal policies, economic measurements, tools, and methodology, financial and investment markets, and the business cycle.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical |

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| | tables, charts, and graphs.<br><br>**Honors/Advanced** courses offer scaffolded learning opportunities for students to develop the critical skills of analysis, synthesis, and evaluation in a more rigorous and reflective academic setting. Students are empowered to perform at higher levels as they engage in the following: analyzing historical documents and supplementary readings, working in the context of thematically categorized information, becoming proficient in note-taking, participating in Socratic seminars/discussions, emphasizing free-response and document-based writing, contrasting opposing viewpoints, solving problems, etc. Students will develop and demonstrate their skills through participation in a capstone and/or extended research-based paper/project (e.g., history fair, participatory citizenship project, mock congressional hearing, projects for competitive evaluation, investment portfolio contests, or other teacher-directed projects).<br><br>**Special Notes:**<br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (61)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.N-Q.1 Reason quantitatively and use units to solve problems**

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| **LACC.1112.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole. |
| **LACC.1112.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas. |
| **LACC.1112.RH.1.3:** | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain. |
| **LACC.1112.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10). |
| **LACC.1112.RH.2.5:** | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole. |

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| LACC.1112.RH.2.6: | Evaluate authors’ differing points of view on the same historical event or issue by assessing the authors’ claims, reasoning, and evidence. |
| LACC.1112.RH.3.7: | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| LACC.1112.RH.3.8: | Evaluate an author’s premises, claims, and evidence by corroborating or challenging them with other information. |
| LACC.1112.RH.3.9: | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources. |
| LACC.1112.RH.4.10: | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently. |
| LACC.1112.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| LACC.1112.SL.1.2: | Integrate multiple sources of information presented in diverse |

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| | formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **SS.912.E.2.10:** | Describe the organization and functions of the Federal Reserve System. |

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| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |

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| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.E.1.1:** | Identify the factors of production and why they are necessary for the production of goods and services.<br>Remarks/Examples<br>Examples are land, labor, capital, entrepreneurship. |
| **SS.912.E.1.10:** | Explain the use of fiscal policy (taxation, spending) to promote price stability, full employment, and economic growth. |
| **SS.912.E.1.11:** | Explain how the Federal Reserve uses the tools of monetary policy (discount rate, reserve requirement, open market operations) to promote price stability, full employment, and economic growth. |
| **SS.912.E.1.12:** | Examine the four phases of the business cycle (peak, contraction - unemployment, trough, expansion - inflation). |
| **SS.912.E.1.13:** | Explain the basic functions and characteristics of money, and describe the composition of the money supply in the United States. |
| **SS.912.E.1.14:** | Compare credit, savings, and investment services available to the consumer from financial institutions. |
| **SS.912.E.1.15:** | Describe the risk and return profiles of various investment vehicles and the importance of diversification.<br>Remarks/Examples<br>Examples are savings accounts, certificates of deposit, stocks, bonds, mutual funds, Individual Retirement Accounts. |
| **SS.912.E.1.16:** | Construct a one-year budget plan for a specific career path including expenses and construction of a credit plan for purchasing a major |

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| | item.<br>Remarks/Examples<br>Examples of a career path are university student, trade school student, food service employee, retail employee, laborer, armed forces enlisted personnel.<br>Examples of a budget plan are housing expenses, furnishing, utilities, food costs, transportation, and personal expenses - medical, clothing, grooming, entertainment and recreation, and gifts and contributions.<br>Examples of a credit plan are interest rates, credit scores, payment plan. |
| **SS.912.E.1.2:** | Analyze production possibilities curves to explain choice, scarcity, and opportunity costs. |
| **SS.912.E.1.3:** | Compare how the various economic systems (traditional, market, command, mixed) answer the questions: (1) What to produce?; (2) How to produce?; and (3) For whom to produce? |
| **SS.912.E.1.4:** | Define supply, demand, quantity supplied,and quantity demanded; graphically illustrate situations that would cause changes in each, and demonstrate how the equilibrium price of a product is determined by the interaction of supply and demand in the market place. |
| **SS.912.E.1.5:** | Compare different forms of business organizations.<br>Remarks/Examples<br>Examples are sole proprietorship, partnership, corporation, limited liability corporation. |
| **SS.912.E.1.6:** | Compare the basic characteristics of the four market structures (monopoly, oligopoly, monopolistic competition, pure competition). |
| **SS.912.E.1.7:** | Graph and explain how firms determine price and output through marginal cost analysis. |
| **SS.912.E.1.8:** | Explain ways firms engage in price and nonprice competition. |
| **SS.912.E.1.9:** | Describe how the earnings of workers are determined.<br>Remarks/Examples<br>Examples are minimum wage, the market value of the product |

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| | produced, workers' productivity. |
| **SS.912.E.2.1:** | Identify and explain broad economic goals.<br>Remarks/Examples<br>Examples are freedom, efficiency, equity, security, growth, price stability, full employment. |
| **SS.912.E.2.11:** | Assess the economic impact of negative and positive externalities on the local, state, and national environment.<br>Remarks/Examples<br>Examples of negative are pollution, global warming.<br>Examples of positive are pure water, better air quality. |
| **SS.912.E.2.12:** | Construct a circular flow diagram for an open-market economy including elements of households, firms, government, financial institutions, product and factor markets, and international trade. |
| **SS.912.E.2.2:** | Use a decision-making model to analyze a public policy issue affecting the student's community that incorporates defining a problem, analyzing the potential consequences, and considering the alternatives. |
| **SS.912.E.2.3:** | Research contributions of entrepreneurs, inventors, and other key individuals from various gender, social, and ethnic backgrounds in the development of the United States. |
| **SS.912.E.2.4:** | Diagram and explain the problems that occur when government institutes wage and price controls, and explain the rationale for these controls.<br>Remarks/Examples<br>Examples are shortage, surplus, other inefficiencies. |
| **SS.912.E.2.5:** | Analyze how capital investments may impact productivity and economic growth.<br>Remarks/Examples<br>Examples are factories, machinery, technology, people. |
| **SS.912.E.2.6:** | Examine the benefits of natural monopolies and the purposes of government regulation of these monopolies. |

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| | Remarks/Examples<br>Examples are electric, water, cable, waste management. |
| **SS.912.E.2.7:** | Identify the impact of inflation on society. |
| **SS.912.E.2.8:** | Differentiate between direct and indirect taxes, and describe the progressivity of taxes (progressive, proportional, regressive).<br>Remarks/Examples<br>Examples are income, sales, social security. |
| **SS.912.E.2.9:** | Analyze how changes in federal spending and taxation affect budget deficits and surpluses and the national debt. |
| **SS.912.E.3.1:** | Demonstrate the impact of inflation on world economies.<br>Remarks/Examples<br>Examples are oil prices, 1973 oil crisis, Great Depression, World War II. |
| **SS.912.E.3.2:** | Examine absolute and comparative advantage, and explain why most trade occurs because of comparative advantage. |
| **SS.912.E.3.3:** | Discuss the effect of barriers to trade and why nations sometimes erect barriers to trade or establish free trade zones.<br>Remarks/Examples<br>Examples are NAFTA, CAFTA.<br>Examples are quotas, tariffs. |
| **SS.912.E.3.4:** | Assess the economic impact of negative and positive externalities on the international environment.<br>Remarks/Examples<br>Examples of negative are pollution, global warming.<br>Examples of positive are pure water, better air quality. |
| **SS.912.E.3.5:** | Compare the current United States economy with other developed and developing nations.<br>Remarks/Examples<br>Examples are standard of living, exchange rates, productivity, gross domestic product. |

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| **SS.912.E.3.6:** | Differentiate and draw conclusions about historical economic thought theorized by economists.<br>Remarks/Examples<br>Examples are Adam Smith, Malthus, Ricardo, Keynes, Friedman, Say, Gilder. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| **SS.912.G.3.3:** | Use geographic terms and tools to explain differing perspectives on the use of renewable and non-renewable resources in Florida, the United States, and the world. |
| **SS.912.G.4.4:** | Use geographic terms and tools to analyze case studies of issues in globalization.<br>Remarks/Examples<br>Examples are cultural imperialism, outsourcing. |

# Course: Economics for Credit Recovery- 2102315

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4433.aspx

## BASIC INFORMATION

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| **Course Title:** | Economics for Credit Recovery |
| **Course Number:** | 2102315 |
| **Course Abbreviated Title:** | ECON CR |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** Economics |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Multiple (M) - Course length can vary |
| **Course Level:** | 2 |
| **Status:** | State Board Approved |
| **General Notes:** | **Economics** - The grade 9-12 Economics course consists of the following content area strands: Economics and Geography. The primary content emphasis for this course pertains to the study of the concepts and processes of the national and international economic systems. Content should include, but is not limited to, currency, banking, and monetary policy, the fundamental concepts relevant to the major economic systems, the global market and economy, major economic theories and economists, the role and influence of the government and fiscal policies, economic measurements, tools, and methodology, financial and investment markets, and the business cycle.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create |

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| | representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Special Notes:**<br>Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (61)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.N-Q.1 Reason quantitatively and use units to solve problems**

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| HE.912.C.2.4: | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| LACC.1112.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole. |
| LACC.1112.RH.1.2: | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas. |
| LACC.1112.RH.1.3: | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain. |
| LACC.1112.RH.2.4: | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison |

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| | defines faction in Federalist No. 10). |
| LACC.1112.RH.2.5: | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole. |
| LACC.1112.RH.2.6: | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence. |
| LACC.1112.RH.3.7: | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| LACC.1112.RH.3.8: | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information. |
| LACC.1112.RH.3.9: | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources. |
| LACC.1112.RH.4.10: | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently. |
| LACC.1112.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine |

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| | what additional information or research is required to deepen the investigation or complete the task. |
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| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from |

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| LACC.1112.WHST.3.7: | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| LACC.1112.WHST.3.8: | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
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| SS.912.E.1.14: | Compare credit, savings, and investment services available to the consumer from financial institutions. |
| SS.912.E.1.15: | Describe the risk and return profiles of various investment vehicles and the importance of diversification.<br>Remarks/Examples<br>Examples are savings accounts, certificates of deposit, stocks, |

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| | bonds, mutual funds, Individual Retirement Accounts. |
| SS.912.E.1.16: | Construct a one-year budget plan for a specific career path including expenses and construction of a credit plan for purchasing a major item.<br>Remarks/Examples<br>Examples of a career path are university student, trade school student, food service employee, retail employee, laborer, armed forces enlisted personnel.<br>Examples of a budget plan are housing expenses, furnishing, utilities, food costs, transportation, and personal expenses - medical, clothing, grooming, entertainment and recreation, and gifts and contributions.<br>Examples of a credit plan are interest rates, credit scores, payment plan. |
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| SS.912.E.1.6: | Compare the basic characteristics of the four market structures (monopoly, oligopoly, monopolistic competition, pure competition). |
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| **SS.912.E.2.5:** | Analyze how capital investments may impact productivity and economic growth.<br>Remarks/Examples |

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| | Examples are factories, machinery, technology, people. |
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| SS.912.E.3.4: | Assess the economic impact of negative and positive externalities on the international environment.<br>Remarks/Examples<br>Examples of negative are pollution, global warming.<br>Examples of positive are pure water, better air quality. |
| SS.912.E.3.5: | Compare the current United States economy with other developed |

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| | and developing nations.<br>Remarks/Examples<br>Examples are standard of living, exchange rates, productivity, gross domestic product. |
| **SS.912.E.3.6:** | Differentiate and draw conclusions about historical economic thought theorized by economists.<br>Remarks/Examples<br>Examples are Adam Smith, Malthus, Ricardo, Keynes, Friedman, Say, Gilder. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| **SS.912.G.3.3:** | Use geographic terms and tools to explain differing perspectives on the use of renewable and non-renewable resources in Florida, the United States, and the world. |
| **SS.912.G.4.4:** | Use geographic terms and tools to analyze case studies of issues in globalization.<br>Remarks/Examples<br>Examples are cultural imperialism, outsourcing. |

# Course: Economics- 2102310

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4430.aspx

## BASIC INFORMATION

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| **Course Title:** | Economics |
| **Course Number:** | 2102310 |
| **Course Abbreviated Title:** | ECON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** Economics |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Semester (S) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **Economics**- The grade 9-12 Economics course consists of the following content area strands: Economics and Geography. The primary content emphasis for this course pertains to the study of the concepts and processes of the national and international economic systems. Content should include, but is not limited to, currency, banking, and monetary policy, the fundamental concepts relevant to the major economic systems, the global market and economy, major economic theories and economists, the role and influence of the government and fiscal policies, economic measurements, tools, and methodology, financial and investment markets, and the business cycle.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs. |

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| | **Special Notes:**<br>**Instructional Practices**<br><br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (61)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.N-Q.1 Reason quantitatively and use units to solve problems**

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys,**

**experiments, and observational studies.**

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| HE.912.C.2.4: | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| LACC.1112.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole. |
| LACC.1112.RH.1.2: | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas. |
| LACC.1112.RH.1.3: | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain. |
| LACC.1112.RH.2.4: | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10). |
| LACC.1112.RH.2.5: | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole. |
| LACC.1112.RH.2.6: | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence. |
| LACC.1112.RH.3.7: | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| LACC.1112.RH.3.8: | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information. |
| LACC.1112.RH.3.9: | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources. |
| LACC.1112.RH.4.10: | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and |

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| | proficiently. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |

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| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **SS.912.E.2.10:** | Describe the organization and functions of the Federal Reserve System. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the |

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| | relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.E.1.1:** | Identify the factors of production and why they are necessary for |

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| | the production of goods and services.<br>Remarks/Examples<br>Examples are land, labor, capital, entrepreneurship. |
| **SS.912.E.1.10:** | Explain the use of fiscal policy (taxation, spending) to promote price stability, full employment, and economic growth. |
| **SS.912.E.1.11:** | Explain how the Federal Reserve uses the tools of monetary policy (discount rate, reserve requirement, open market operations) to promote price stability, full employment, and economic growth. |
| **SS.912.E.1.12:** | Examine the four phases of the business cycle (peak, contraction - unemployment, trough, expansion - inflation). |
| **SS.912.E.1.13:** | Explain the basic functions and characteristics of money, and describe the composition of the money supply in the United States. |
| **SS.912.E.1.14:** | Compare credit, savings, and investment services available to the consumer from financial institutions. |
| **SS.912.E.1.15:** | Describe the risk and return profiles of various investment vehicles and the importance of diversification.<br>Remarks/Examples<br>Examples are savings accounts, certificates of deposit, stocks, bonds, mutual funds, Individual Retirement Accounts. |
| **SS.912.E.1.16:** | Construct a one-year budget plan for a specific career path including expenses and construction of a credit plan for purchasing a major item.<br>Remarks/Examples<br>Examples of a career path are university student, trade school student, food service employee, retail employee, laborer, armed forces enlisted personnel.<br>Examples of a budget plan are housing expenses, furnishing, utilities, food costs, transportation, and personal expenses - medical, clothing, grooming, entertainment and recreation, and gifts and contributions.<br>Examples of a credit plan are interest rates, credit scores, payment plan. |

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| **SS.912.E.1.2:** | Analyze production possibilities curves to explain choice, scarcity, and opportunity costs. |
| **SS.912.E.1.3:** | Compare how the various economic systems (traditional, market, command, mixed) answer the questions: (1) What to produce?; (2) How to produce?; and (3) For whom to produce? |
| **SS.912.E.1.4:** | Define supply, demand, quantity supplied,and quantity demanded; graphically illustrate situations that would cause changes in each, and demonstrate how the equilibrium price of a product is determined by the interaction of supply and demand in the market place. |
| **SS.912.E.1.5:** | Compare different forms of business organizations.<br>Remarks/Examples<br>Examples are sole proprietorship, partnership, corporation, limited liability corporation. |
| **SS.912.E.1.6:** | Compare the basic characteristics of the four market structures (monopoly, oligopoly, monopolistic competition, pure competition). |
| **SS.912.E.1.7:** | Graph and explain how firms determine price and output through marginal cost analysis. |
| **SS.912.E.1.8:** | Explain ways firms engage in price and nonprice competition. |
| **SS.912.E.1.9:** | Describe how the earnings of workers are determined.<br>Remarks/Examples<br>Examples are minimum wage, the market value of the product produced, workers' productivity. |
| **SS.912.E.2.1:** | Identify and explain broad economic goals.<br>Remarks/Examples<br>Examples are freedom, efficiency, equity, security, growth, price stability, full employment. |
| **SS.912.E.2.11:** | Assess the economic impact of negative and positive externalities on the local, state, and national environment.<br>Remarks/Examples<br>Examples of negative are pollution, global warming.<br>Examples of positive are pure water, better air quality. |

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| SS.912.E.2.12: | Construct a circular flow diagram for an open-market economy including elements of households, firms, government, financial institutions, product and factor markets, and international trade. |
| SS.912.E.2.2: | Use a decision-making model to analyze a public policy issue affecting the student's community that incorporates defining a problem, analyzing the potential consequences, and considering the alternatives. |
| SS.912.E.2.3: | Research contributions of entrepreneurs, inventors, and other key individuals from various gender, social, and ethnic backgrounds in the development of the United States. |
| SS.912.E.2.4: | Diagram and explain the problems that occur when government institutes wage and price controls, and explain the rationale for these controls.<br>Remarks/Examples<br>Examples are shortage, surplus, other inefficiencies. |
| SS.912.E.2.5: | Analyze how capital investments may impact productivity and economic growth.<br>Remarks/Examples<br>Examples are factories, machinery, technology, people. |
| SS.912.E.2.6: | Examine the benefits of natural monopolies and the purposes of government regulation of these monopolies.<br>Remarks/Examples<br>Examples are electric, water, cable, waste management. |
| SS.912.E.2.7: | Identify the impact of inflation on society. |
| SS.912.E.2.8: | Differentiate between direct and indirect taxes, and describe the progressivity of taxes (progressive, proportional, regressive).<br>Remarks/Examples<br>Examples are income, sales, social security. |
| SS.912.E.2.9: | Analyze how changes in federal spending and taxation affect budget deficits and surpluses and the national debt. |
| SS.912.E.3.1: | Demonstrate the impact of inflation on world economies.<br>Remarks/Examples |

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| | Examples are oil prices, 1973 oil crisis, Great Depression, World War II. |
| SS.912.E.3.2: | Examine absolute and comparative advantage, and explain why most trade occurs because of comparative advantage. |
| SS.912.E.3.3: | Discuss the effect of barriers to trade and why nations sometimes erect barriers to trade or establish free trade zones.<br>Remarks/Examples<br>Examples are NAFTA, CAFTA.<br>Examples are quotas, tariffs. |
| SS.912.E.3.4: | Assess the economic impact of negative and positive externalities on the international environment.<br>Remarks/Examples<br>Examples of negative are pollution, global warming.<br>Examples of positive are pure water, better air quality. |
| SS.912.E.3.5: | Compare the current United States economy with other developed and developing nations.<br>Remarks/Examples<br>Examples are standard of living, exchange rates, productivity, gross domestic product. |
| SS.912.E.3.6: | Differentiate and draw conclusions about historical economic thought theorized by economists.<br>Remarks/Examples<br>Examples are Adam Smith, Malthus, Ricardo, Keynes, Friedman, Say, Gilder. |
| SS.912.G.2.2: | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| SS.912.G.3.3: | Use geographic terms and tools to explain differing perspectives on the use of renewable and non-renewable resources in Florida, the United States, and the world. |
| SS.912.G.4.4: | Use geographic terms and tools to analyze case studies of issues in |

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| | globalization.<br>Remarks/Examples |
| | Examples are cultural imperialism, outsourcing. |
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# Course: Anthropology- 2101300

**Direct link to this page:**[http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4443.aspx](http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4443.aspx)

## BASIC INFORMATION

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| **Course Title:** | Anthropology |
| **Course Number:** | 2101300 |
| **Course Abbreviated Title:** | ANTHROP |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** Anthropology |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Semester (S) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | The grade 9-12 Anthropology course consists of the following content area strands: American History, World History, Geography, Humanities, Civics and Government. The primary content emphasis for this course pertains to the study of the differences and similarities, both biological and cultural, in human populations. Students recognize the characteristics that define their culture and gain an appreciation for the culture of others. Content should include, but is not limited to, human biological and cultural origins, adaptation to the physical environment, the diversity of human behavior, the evolution of social and cultural institutions, patterns of language development, family and kinship relationships, and the effect of change on cultural institutions.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical |

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| | tables, charts, and graphs.<br><br>**Instructional Practices**<br><br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (75)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys,**

**experiments, and observational studies.**

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| HE.912.C.2.7: | Analyze how culture supports and challenges health beliefs, practices, and behaviors.<br>Remarks/Examples<br>Various cultures' dietary patterns, rites of passage, courtship practices, family roles, personal relationships, ethics, and parenting. |
| LACC.910.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| LACC.910.RH.1.2: | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
| LACC.910.RH.1.3: | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |
| LACC.910.RH.2.4: | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| LACC.910.RH.2.5: | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| LACC.910.RH.2.6: | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| LACC.910.RH.3.7: | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| LACC.910.RH.3.8: | Assess the extent to which the reasoning and evidence in a text support the author’s claims. |
| LACC.910.RH.3.9: | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| LACC.910.RH.4.10: | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |
| LACC.910.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ |

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| | ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline- |

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| | appropriate form and in a manner that anticipates the audience’s knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, |

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| | organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.7.11:** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12:** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights |

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| | violations. |
| **SS.912.A.7.14:** | Review the role of the United States as a participant in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| **SS.912.A.7.15:** | Analyze the effects of foreign and domestic terrorism on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, Oklahoma City bombing, attack of September 11, 2001, Patriot Act, wars in Afghanistan and Iraq. |
| **SS.912.A.7.16:** | Examine changes in immigration policy and attitudes toward immigration since 1950. |
| **SS.912.A.7.17:** | Examine key events and key people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.C.2.10:** | Monitor current public issues in Florida.<br>Remarks/Examples<br>Examples are On-line Sunshine, media, e-mails to government officials, political text messaging. |
| **SS.912.C.2.12:** | Explain the changing roles of television, radio, press, and Internet in political communication. |
| **SS.912.C.2.13:** | Analyze various forms of political communication and evaluate for bias, factual accuracy, omission, and emotional appeal. |

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| | Remarks/Examples<br>Examples are political cartoons, propaganda, campaign advertisements, political speeches, electronic bumper stickers, blogs, media. |
| **SS.912.C.2.2:** | Evaluate the importance of political participation and civic participation. |
| **SS.912.C.2.3:** | Experience the responsibilities of citizens at the local, state, or federal levels.<br>Remarks/Examples<br>Examples are registering or pre-registering to vote, volunteering, communicating with government officials, informing others about current issues, participating in a political campaign/mock election. |
| **SS.912.C.2.4:** | Evaluate, take, and defend positions on issues that cause the government to balance the interests of individuals with the public good. |
| **SS.912.C.4.1:** | Explain how the world's nations are governed differently. |
| **SS.912.C.4.2:** | Evaluate the influence of American foreign policy on other nations and the influences of other nations on American policies and society. |
| **SS.912.C.4.3:** | Assess human rights policies of the United States and other countries. |
| **SS.912.C.4.4:** | Compare indicators of democratization in multiple countries. |
| **SS.912.E.2.2:** | Use a decision-making model to analyze a public policy issue affecting the student's community that incorporates defining a problem, analyzing the potential consequences, and considering the alternatives. |
| **SS.912.E.3.5:** | Compare the current United States economy with other developed and developing nations.<br>Remarks/Examples<br>Examples are standard of living, exchange rates, productivity, gross domestic product. |
| **SS.912.G.1.1:** | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |

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| **SS.912.G.1.2:** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| **SS.912.G.1.4:** | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| **SS.912.G.2.1:** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| **SS.912.G.2.3:** | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| **SS.912.G.4.1:** | Interpret population growth and other demographic data for any given place. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.G.4.7:** | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |

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| **SS.912.G.4.9:** | Use political maps to describe the change in boundaries and governments within continents over time. |
| **SS.912.H.1.4:** | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| **SS.912.H.3.2:** | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture. |
| **SS.912.W.1.1:** | Use timelines to establish cause and effect relationships of historical events. |
| **SS.912.W.1.2:** | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| **SS.912.W.1.3:** | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| **SS.912.W.1.4:** | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| **SS.912.W.1.5:** | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| **SS.912.W.1.6:** | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |

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| **SS.912.W.3.1:** | Discuss significant people and beliefs associated with Islam.<br>Remarks/Examples<br>Examples are the prophet Muhammad, the early caliphs, the Pillars of Islam, Islamic law, the relationship between government and religion in Islam. |
| **SS.912.W.3.2:** | Compare the major beliefs and principles of Judaism, Christianity, and Islam. |
| **SS.912.W.6.4:** | Describe the 19th and early 20th century social and political reforms and reform movements and their effects in Africa, Asia, Europe, the United States, the Caribbean, and Latin America.<br>Remarks/Examples<br>Examples are Meiji Reforms, abolition of slavery in the British Empire, expansion of women's rights, labor laws. |
| **SS.912.W.8.10:** | Explain the impact of religious fundamentalism in the last half of the 20th century, and identify related events and forces in the Middle East over the last several decades.<br>Remarks/Examples<br>Examples are Iranian Revolution, Mujahideen in Afghanistan, Persian Gulf War. |
| **SS.912.W.8.7:** | Compare post-war independence movements in African, Asian, and Caribbean countries. |
| **SS.912.W.8.9:** | Analyze the successes and failures of democratic reform movements in Africa, Asia, the Caribbean, and Latin America. |
| **SS.912.W.9.1:** | Identify major scientific figures and breakthroughs of the 20th century, and assess their impact on contemporary life.<br>Remarks/Examples<br>Examples are Marie Curie, Albert Einstein, Enrico Fermi, Sigmund Freud, Wright Brothers, Charles R. Drew, mass vaccination, atomic energy, transistor, microchip, space exploration, Internet, discovery of DNA, Human Genome Project. |
| **SS.912.W.9.3:** | Explain cultural, historical, and economic factors and governmental policies that created the opportunities for ethnic cleansing or genocide in Cambodia, the Balkans, Rwanda, and Darfur, and |

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| | describe various governmental and non-governmental responses to them.<br>Remarks/Examples<br>Examples are prejudice, racism, stereotyping, economic competition. |
| **SS.912.W.9.4:** | Describe the causes and effects of twentieth century nationalist conflicts.<br>Remarks/Examples<br>Examples are Cyprus, Kashmir, Tibet, Northern Ireland. |
| **SS.912.W.9.5:** | Assess the social and economic impact of pandemics on a global scale, particularly within the developing and under-developed world. |
| **SS.912.W.9.6:** | Analyze the rise of regional trade blocs such as the European Union and NAFTA, and predict the impact of increased globalization in the 20th and 21st centuries. |
| **SS.912.W.9.7:** | Describe the impact of and global response to international terrorism. |

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| | a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while |

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| | attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| LACC.910.WHST.2.4: | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| LACC.910.WHST.2.5: | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| LACC.910.WHST.2.6: | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| LACC.910.WHST.3.7: | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| LACC.910.WHST.3.8: | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| LACC.910.WHST.3.9: | Draw evidence from informational texts to support analysis, reflection, and research. |
| LACC.910.WHST.4.10: | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| SS.912.A.1.1: | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| SS.912.A.1.2: | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a |

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| | historical period. |
| SS.912.A.1.3: | Utilize timelines to identify the time sequence of historical data. |
| SS.912.A.1.4: | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| SS.912.A.1.5: | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| SS.912.A.1.6: | Use case studies to explore social, political, legal, and economic relationships in history. |
| SS.912.A.1.7: | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| SS.912.A.2.1: | Review causes and consequences of the Civil War.<br>Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| SS.912.A.2.2: | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| SS.912.A.2.5: | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| SS.912.A.2.6: | Compare the effects of the Black Codes and the Nadir on freed |

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| | people, and analyze the sharecropping system and debt peonage as practiced in the United States. |
| **SS.912.A.2.7:** | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |
| **SS.912.A.3.1:** | Analyze the economic challenges to American farmers and farmers' responses to these challenges in the mid to late 1800s.<br>Remarks/Examples<br>Examples may include, but are not limited to, creation of agricultural colleges, Morrill Land Grant Act, gold standard and Bimetallism, the creation of the Populist Party. |
| **SS.912.A.3.13:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.2:** | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |
| **SS.912.A.3.3:** | Compare the first and second Industrial Revolutions in the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, trade, development of new industries. |
| **SS.912.A.3.4:** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.6:** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.5.10:** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| **SS.912.A.5.7:** | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women. |
| **SS.912.A.6.9:** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Declaration of Human Rights. |
| **SS.912.A.7.12:** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.14:** | Review the role of the United States as a participant  in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |

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| SS.912.A.7.5: | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| SS.912.A.7.6: | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement.<br>Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| SS.912.A.7.7: | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| SS.912.A.7.8: | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| SS.912.A.7.9: | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s. |

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| **SS.912.C.2.10:** | Monitor current public issues in Florida.<br>Remarks/Examples<br>Examples are On-line Sunshine, media, e-mails to government officials, political text messaging. |
| **SS.912.C.2.11:** | Analyze public policy solutions or courses of action to resolve a local, state, or federal issue. |
| **SS.912.C.2.9:** | Identify the expansion of civil rights and liberties by examining the principles contained in primary documents.<br>Remarks/Examples<br>Examples are Preamble, Declaration of Independence, Constitution, Emancipation Proclamation, 13th, 14th, 15th, 19th, 24th, and 26th Amendments, Voting Rights Act of 1965. |
| **SS.912.C.3.10:** | Evaluate the significance and outcomes of landmark Supreme Court cases.<br>Remarks/Examples<br>Examples are Marbury v. Madison, Plessy v. Ferguson, Brown v. Board of Education, Gideon v. Wainwright, Miranda v. Arizona, Tinker v. Des Moines, Hazelwood v. Kuhlmier, United States v. Nixon, Roe v. Wade, Bush v. Gore, Texas v. Johnson, Mapp v. Ohio, McCulloch v. Maryland, District of Columbia v. Heller. |
| **SS.912.C.4.3:** | Assess human rights policies of the United States and other countries. |
| **SS.912.E.2.3:** | Research contributions of entrepreneurs, inventors, and other key individuals from various gender, social, and ethnic backgrounds in the development of the United States. |
| **SS.912.G.1.1:** | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| **SS.912.G.1.2:** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |

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| SS.912.G.1.4: | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| SS.912.G.2.1: | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources.<br>Examples of human characteristics are religion, government, economy, demography. |
| SS.912.G.2.4: | Use geographic terms and tools to analyze case studies of how selected regions change over time. |
| SS.912.G.2.5: | Use geographic terms and tools to analyze case studies of debates over how human actions modify a selected region.<br>Remarks/Examples<br>Examples are mining, drilling, farming, housing. |
| SS.912.G.3.1: | Use geographic terms to locate and describe major ecosystems of Earth. |
| SS.912.G.3.2: | Use geographic terms and tools to explain how weather and climate influence the natural character of a place. |
| SS.912.G.3.3: | Use geographic terms and tools to explain differing perspectives on the use of renewable and non-renewable resources in Florida, the United States, and the world. |
| SS.912.G.3.4: | Use geographic terms and tools to explain how the Earth's internal changes and external changes influence the character of places.<br>Remarks/Examples<br>Examples of internal are volcanic activity, folding.<br>Examples of external are erosion, water cycle. |

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| SS.912.G.4.1: | Interpret population growth and other demographic data for any given place. |
| SS.912.G.4.2: | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| SS.912.G.4.3: | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| SS.912.G.4.5: | Use geographic terms and tools to analyze case studies of the development, growth, and changing nature of cities and urban centers. |
| SS.912.G.4.6: | Use geographic terms and tools to predict the effect of a change in a specific characteristic of a place on the human population of that place. |
| SS.912.G.4.7: | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |
| SS.912.G.4.8: | Use geographic concepts to analyze spatial phenomena and to discuss economic, political, and social factors that define and interpret space. |
| SS.912.G.4.9: | Use political maps to describe the change in boundaries and governments within continents over time. |
| SS.912.H.1.4: | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| SS.912.H.3.1: | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| SS.912.W.1.1: | Use timelines to establish cause and effect relationships of historical events. |
| SS.912.W.1.2: | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| SS.912.W.1.3: | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples |

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| | Examples are artifacts, images, auditory and written sources. |
| **SS.912.W.1.4:** | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| **SS.912.W.1.5:** | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| **SS.912.W.1.6:** | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |
| **SS.912.W.4.11:** | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors. |
| **SS.912.W.4.12:** | Evaluate the scope and impact of the Columbian Exchange on Europe, Africa, Asia, and the Americas. |
| **SS.912.W.4.13:** | Examine the various economic and political systems of Portugal, Spain, the Netherlands, France, and England in the Americas. |

# Course: African-American History- 2100340

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4510.aspx

## BASIC INFORMATION

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| **Course Title:** | African-American History |
| **Course Number:** | 2100340 |
| **Course Abbreviated Title:** | AFRICAN-AMER HIST |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Semester (S) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **African-American History** - The grade 9-12 African-American History course consists of the following content area strands: World History, American History, Geography, Humanities, Civics and Government. The primary content emphasis for this course pertains to the study of the chronological development of African Americans by examining the political, economic, social, religious, military and cultural events that affected the cultural group. Content will include, but is not limited to, West African heritage, the Middle Passage and Triangular Trade, the African Diaspora, significant turning points and trends in the development of African American culture and institutions, enslavement and emancipation, the Abolition, Black Nationalist, and Civil Rights movements, major historical figures and events in African-American history, and contemporary African-American affairs.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction |

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| | should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices:**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (82)

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| **LACC.910.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| **LACC.910.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |

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| LACC.910.RH.1.3: | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |
| LACC.910.RH.2.4: | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| LACC.910.RH.2.5: | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| LACC.910.RH.2.6: | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| LACC.910.RH.3.7: | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| LACC.910.RH.3.8: | Assess the extent to which the reasoning and evidence in a text support the author's claims. |
| LACC.910.RH.3.9: | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| LACC.910.RH.4.10: | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |
| LACC.910.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize |

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| | points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| [LACC.910.SL.1.2:](#) | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| [LACC.910.SL.1.3:](#) | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| [LACC.910.SL.2.4:](#) | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| [LACC.910.WHST.1.1:](#) | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| [LACC.910.WHST.1.2:](#) | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical |

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| | processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |

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| LACC.910.WHST.3.8: | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| LACC.910.WHST.3.9: | Draw evidence from informational texts to support analysis, reflection, and research. |
| LACC.910.WHST.4.10: | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| SS.912.A.1.1: | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| SS.912.A.1.2: | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |
| SS.912.A.1.3: | Utilize timelines to identify the time sequence of historical data. |
| SS.912.A.1.4: | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| SS.912.A.1.5: | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| SS.912.A.1.6: | Use case studies to explore social, political, legal, and economic relationships in history. |
| SS.912.A.1.7: | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| SS.912.A.2.1: | Review causes and consequences of the Civil War. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| **SS.912.A.2.2:** | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| **SS.912.A.2.4:** | Distinguish the freedoms guaranteed to African Americans and other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| **SS.912.A.2.5:** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| **SS.912.A.2.6:** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States. |
| **SS.912.A.3.5:** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.8:** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor). |

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| **SS.912.A.4.11:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.8:** | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe. |
| **SS.912.A.4.9:** | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States. |
| **SS.912.A.5.10:** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| **SS.912.A.5.2:** | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| **SS.912.A.5.6:** | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s. |
| **SS.912.A.5.7:** | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women. |
| **SS.912.A.5.8:** | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience. |
| **SS.912.A.5.9:** | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |
| **SS.912.A.6.9:** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, the Declaration of Human Rights. |
| **SS.912.A.7.11:** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12:** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.17:** | Examine key events and key people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.A.7.5:** | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| **SS.912.A.7.6:** | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| **SS.912.A.7.7:** | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| **SS.912.A.7.8:** | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| **SS.912.A.7.9:** | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s. |
| **SS.912.C.2.9:** | Identify the expansion of civil rights and liberties by examining the principles contained in primary documents.<br>Remarks/Examples<br>Examples are Preamble, Declaration of Independence, Constitution, Emancipation Proclamation, 13th, 14th, 15th, 19th, 24th, and 26th Amendments, Voting Rights Act of 1965. |
| **SS.912.C.3.10:** | Evaluate the significance and outcomes of landmark Supreme Court cases. |

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| | Remarks/Examples<br>Examples are Marbury v. Madison, Plessy v. Ferguson, Brown v. Board of Education, Gideon v. Wainwright, Miranda v. Arizona, Tinker v. Des Moines, Hazelwood v. Kuhlmier, United States v. Nixon, Roe v. Wade, Bush v. Gore, Texas v. Johnson, Mapp v. Ohio, McCulloch v. Maryland, District of Columbia v. Heller. |
| **SS.912.C.4.3:** | Assess human rights policies of the United States and other countries. |
| **SS.912.E.2.3:** | Research contributions of entrepreneurs, inventors, and other key individuals from various gender, social, and ethnic backgrounds in the development of the United States. |
| **SS.912.G.1.1:** | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| **SS.912.G.1.2:** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| **SS.912.G.1.4:** | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| **SS.912.G.2.1:** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |

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| **SS.912.G.2.3:** | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| **SS.912.G.4.1:** | Interpret population growth and other demographic data for any given place. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.G.4.7:** | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |
| **SS.912.G.4.9:** | Use political maps to describe the change in boundaries and governments within continents over time. |
| **SS.912.H.1.4:** | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| **SS.912.W.1.1:** | Use timelines to establish cause and effect relationships of historical events. |
| **SS.912.W.1.2:** | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| **SS.912.W.1.3:** | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |

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| SS.912.W.1.4: | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| SS.912.W.1.5: | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| SS.912.W.1.6: | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |
| SS.912.W.4.14: | Recognize the practice of slavery and other forms of forced labor experienced during the 13th through 17th centuries in East Africa, West Africa, Europe, Southwest Asia, and the Americas. |
| SS.912.W.4.15: | Explain the origins, developments, and impact of the trans-Atlantic slave trade between West Africa and the Americas. |

# Course: United States History Honors- 2100320

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4495.aspx

## BASIC INFORMATION

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| **Course Title:** | United States History Honors |
| **Course Number:** | 2100320 |
| **Course Abbreviated Title:** | US HIST HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | **United States History (U.S. History) 9-12 Course** - The grade 9-12 United States History course consists of the following content area strands: United States History, Geography, and Humanities. The primary content emphasis for this course pertains to the study of United States history from Reconstruction to the present day. Students will be exposed to the historical, geographic, political, economic, and sociological events which influenced the development of the United States and the resulting impact on world history. So that students can clearly see the relationship between cause and effect in historical events, |

students should have the opportunity to review those fundamental ideas and events which occurred before the end of Reconstruction.

**Honors/Advanced** courses offer scaffolded learning opportunities for students to develop the critical skills of analysis, synthesis, and evaluation in a more rigorous and reflective academic setting. Students are empowered to perform at higher levels as they engage in the following: analyzing historical documents and supplementary readings, working in the context of thematically categorized information, becoming proficient in note-taking, participating in Socratic seminars/discussions, emphasizing free-response and document-based writing, contrasting opposing viewpoints, solving problems, etc. Students will develop and demonstrate their skills through participation in a capstone and/or extended research-based paper/project (e.g., history fair, participatory citizenship project, mock congressional hearing, projects for competitive evaluation, investment portfolio contests, or other teacher-directed projects).

**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.

**Special Notes:**
Additional content that may be contained in the NAEP Grade 12 United States History assessment includes material from all time periods on the following topics:

- Change and Continuity in American Democracy: Ideas, Institutions, Events, Key Figures, and Controversies
- The Gathering and Interactions of Peoples, Cultures, and Ideas
- Economic and Technological Changes and Their Relationship to Society, Ideas, and the Environment
- The Changing Role of America in the World

The NAEP frameworks for United States History may be accessed at http://www.nagb.org/content/nagb/assets/documents/publications/frameworks/historyframework.pdf

**Instructional Practices:**
Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:

1. Reading assignments from longer text passages as well as shorter ones

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| | when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (115)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| HE.912.C.2.4: | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| LACC.1112.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole. |
| LACC.1112.RH.1.2: | Determine the central ideas or information of a primary or |

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| | secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas. |
| **LACC.1112.RH.1.3:** | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain. |
| **LACC.1112.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10). |
| **LACC.1112.RH.2.5:** | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole. |
| **LACC.1112.RH.2.6:** | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence. |
| **LACC.1112.RH.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| **LACC.1112.RH.3.8:** | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information. |
| **LACC.1112.RH.3.9:** | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources. |
| **LACC.1112.RH.4.10:** | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently. |
| **SS.912.A.1.2:** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |
| **SS.912.A.1.3:** | Utilize timelines to identify the time sequence of historical data. |
| **SS.912.A.1.4:** | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| **SS.912.A.1.5:** | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples |

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| | Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |

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| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **SS.912.A.1.6:** | Use case studies to explore social, political, legal, and economic relationships in history. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and |

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| | multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, |

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| | reflection, and research. |
| LACC.1112.WHST.4.10: | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| SS.912.A.1.1: | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| SS.912.A.1.7: | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| SS.912.A.2.1: | Review causes and consequences of the Civil War.<br>Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| SS.912.A.2.2: | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| SS.912.A.2.3: | Describe the issues that divided Republicans during the early Reconstruction era.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| SS.912.A.2.4: | Distinguish the freedoms guaranteed to African Americans and other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |

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| **SS.912.A.2.5:** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| **SS.912.A.2.6:** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States. |
| **SS.912.A.2.7:** | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |
| **SS.912.A.3.1:** | Analyze the economic challenges to American farmers and farmers' responses to these challenges in the mid to late 1800s.<br>Remarks/Examples<br>Examples may include, but are not limited to, creation of agricultural colleges, Morrill Land Grant Act, gold standard and Bimetallism, the creation of the Populist Party. |
| **SS.912.A.3.10:** | Review different economic and philosophic ideologies.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |
| **SS.912.A.3.11:** | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |
| **SS.912.A.3.12:** | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, |

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| | Women's Christian Temperance Union, National Women's Suffrage Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |
| **SS.912.A.3.13:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.2:** | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |
| **SS.912.A.3.3:** | Compare the first and second Industrial Revolutions in the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, trade, development of new industries. |
| **SS.912.A.3.4:** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.5:** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard |

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| | Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6:** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.3.7:** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8:** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor). |
| **SS.912.A.3.9:** | Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |
| **SS.912.A.4.1:** | Analyze the major factors that drove United States imperialism.<br>Remarks/Examples<br>Examples may include, but are not limited to,  the Monroe Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |

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| SS.912.A.4.10: | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |
| SS.912.A.4.11: | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| SS.912.A.4.2: | Explain the motives of the United States acquisition of the territories.<br>Remarks/Examples<br>Examples may include, but are not limited to, Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| SS.912.A.4.3: | Examine causes, course, and consequences of the Spanish American War.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| SS.912.A.4.4: | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| SS.912.A.4.5: | Examine causes, course, and consequences of United States |

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| | involvement in World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |
| **SS.912.A.4.6:** | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public Information). |
| **SS.912.A.4.7:** | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys). |
| **SS.912.A.4.8:** | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe. |
| **SS.912.A.4.9:** | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States. |
| **SS.912.A.5.1:** | Discuss the economic outcomes of demobilization. |
| **SS.912.A.5.10:** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| **SS.912.A.5.11:** | Examine causes, course, and consequences of the Great Depression and the New Deal. |
| **SS.912.A.5.12:** | Examine key events and people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| **SS.912.A.5.2:** | Explain the causes of the public reaction (Sacco and Vanzetti, labor, |

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| | racial unrest) associated with the Red Scare.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| SS.912.A.5.3: | Examine the impact of United States foreign economic policy during the 1920s.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |
| SS.912.A.5.4: | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices. |
| SS.912.A.5.5: | Describe efforts by the United States and other world powers to avoid future wars.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| SS.912.A.5.6: | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s. |
| SS.912.A.5.7: | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women. |
| SS.912.A.5.8: | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience. |
| SS.912.A.5.9: | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |
| SS.912.A.6.1: | Examine causes, course, and consequences of World War II on the |

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| | United States and the world.<br>Remarks/Examples<br>Examples may include, but are not limited to, riseof dictators, attack on Pearl Harbor, Nazi party, American neutrality, D-Day, Battle of the Bulge, War in the Pacific, internment camps, Holocaust, Yalta. |
| **SS.912.A.6.10:** | Examine causes, course, and consequences of the early years of the Cold War (Truman Doctrine, Marshall Plan, NATO, Warsaw Pact). |
| **SS.912.A.6.11:** | Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world. |
| **SS.912.A.6.12:** | Examine causes, course, and consequences of the Korean War.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Communist China, 38th parallel, cease fire, firing of Gen. Douglas McArthur. |
| **SS.912.A.6.13:** | Analyze significant foreign policy events during the Truman, Eisenhower, Kennedy, Johnson, and Nixon administrations.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Domino Theory, Sputnik, space race, Korean Conflict, Vietnam Conflict, U-2 and Gary Powers, Bay of Pigs invasion, Cuban Missile Crisis, Berlin Wall, Ping Pong Diplomacy, opening of China. |
| **SS.912.A.6.14:** | Analyze causes, course, and consequences of the Vietnam War.<br>Remarks/Examples<br>Examples may include, but are not lmited to, Geneva Accords, Gulf of Tonkin Resolution, the draft, escalating protest at home, Vietnamization, the War Powers Act. |
| **SS.912.A.6.15:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Mosquito Fleet, "Double V Campaign", construction of military bases and WWII training centers, 1959 Cuban coup and its impact on Florida, development of the space program and NASA. |

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| **SS.912.A.6.2:** | Describe the United States response in the early years of World War II (Neutrality Acts, Cash and Carry, Lend Lease Act). |
| **SS.912.A.6.3:** | Analyze the impact of the Holocaust during World War II on Jews as well as other groups. |
| **SS.912.A.6.4:** | Examine efforts to expand or contract rights for various populations during World War II.<br>Remarks/Examples<br>Examples may include, but are not limited to, women, African Americans, German Americans, Japanese Americans and their internment, Native Americans, Hispanic Americans, Italian Americans. |
| **SS.912.A.6.5:** | Explain the impact of World War II on domestic government policy.<br>Remarks/Examples<br>Examples may include, but are not limited to, rationing, national security, civil rights, increased job opportunities for African Americans, women, Jews, and other refugees. |
| **SS.912.A.6.6:** | Analyze the use of atomic weapons during World War II and the aftermath of the bombings. |
| **SS.912.A.6.7:** | Describe the attempts to promote international justice through the Nuremberg Trials. |
| **SS.912.A.6.8:** | Analyze the effects of the Red Scare on domestic United States policy.<br>Remarks/Examples<br>Examples may include, but are not limited to, loyalty review program, House Un-American Activities Committee, McCarthyism (Sen. Joe McCarthy), McCarran Act. |
| **SS.912.A.6.9:** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Declaration of Human Rights. |

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| SS.912.A.7.1: | Identify causes for Post-World War II prosperity and its effects on American society.<br>Remarks/Examples<br>Examples may include, but are not limited to, G.I. Bill, Baby Boom, growth of suburbs, Beatnik movement, youth culture, religious revivalism (e.g., Billy Graham and Bishop Fulton J. Sheen), conformity of the 1950s and the protest in the 1960s. |
| SS.912.A.7.10: | Analyze the significance of Vietnam and Watergate on the government and people of the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, mistrust of government, reinforcement of freedom of the press, as well as checks and balances, *New York Times v. Nixon.* |
| SS.912.A.7.11: | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| SS.912.A.7.12: | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| SS.912.A.7.13: | Analyze the attempts to extend New Deal legislation through the Great Society and the successes and failures of these programs to promote social and economic stability.<br>Remarks/Examples<br>Examples may include, but are not limited to, Civil Rights Act of 1964, Voting Rights Act of 1965, War on Poverty, Medicare, Medicaid, Headstart. |

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| SS.912.A.7.14: | Review the role of the United States as a participant in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| SS.912.A.7.15: | Analyze the effects of foreign and domestic terrorism on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, Oklahoma City bombing, attack of September 11, 2001, Patriot Act, wars in Afghanistan and Iraq. |
| SS.912.A.7.16: | Examine changes in immigration policy and attitudes toward immigration since 1950. |
| SS.912.A.7.17: | Examine key events and key people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| SS.912.A.7.2: | Compare the relative prosperity between different ethnic groups and social classes in the post-World War II period. |
| SS.912.A.7.3: | Examine the changing status of women in the United States from post-World War II to present.<br>Remarks/Examples<br>Examples may include, but are not limited to, increased numbers of women in the workforce, Civil Rights Act of 1964, *The Feminine Mystique*, National Organization for Women, *Roe v. Wade,* Equal Rights Amendment, Title IX, Betty Freidan, Gloria Steinem, Phyllis Schlafly, Billie Jean King, feminism. |
| SS.912.A.7.4: | Evaluate the success of 1960s era presidents' foreign and domestic |

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| | policies.<br>Remarks/Examples<br>Examples may include, but are not limited to, civil rights legislation, Space Race, Great Society, War on Poverty. |
| **SS.912.A.7.5:** | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| **SS.912.A.7.6:** | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement.<br>Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| **SS.912.A.7.7:** | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| **SS.912.A.7.8:** | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. |

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| | Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| **SS.912.A.7.9:** | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s. |
| **SS.912.G.1.2:** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| **SS.912.G.2.1:** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br><br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.H.1.1:** | Relate works in the arts (architecture, dance, music, theatre, and visual arts) of varying styles and genre according to the periods in which they were created.<br>Remarks/Examples<br>Examples are Bronze Age, Ming Dynasty, Classical, Renaissance, Modern, and Contemporary. |
| **SS.912.H.1.3:** | Relate works in the arts to various cultures.<br>Remarks/Examples<br>Examples are African, Asian, Oceanic, European, the Americas, Middle Eastern, Egyptian, Greek, Roman. |
| **SS.912.H.1.5:** | Examine artistic response to social issues and new ideas in various cultures. |

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| | Remarks/Examples<br>Examples are Victor Hugo's Les Miserables, Langston Hughes' poetry, Pete Seeger's Bring 'Em Home. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |

# Course: United States History for Credit Recovery- 2100315

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4485.aspx

## BASIC INFORMATION

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| **Course Title:** | United States History for Credit Recovery |
| **Course Number:** | 2100315 |
| **Course Abbreviated Title:** | US HIST CR |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Multiple (M) - Course length can vary |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **United States History (U.S. History) 9-12 Course** - The grade 9-12 United States History course consists of the following content area strands: United States History, Geography, and Humanities. The primary content emphasis for this course pertains to the study of United States history from Reconstruction to the present day. Students will be exposed to the historical, geographic, political, economic, and sociological events which influenced the development of the United States and the resulting impact on world history. So that students can |

clearly see the relationship between cause and effect in historical events, students should have the opportunity to review those fundamental ideas and events which occurred before the end of Reconstruction.

**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.

**Special Notes:**
Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.

Additional content that may be contained in the NAEP Grade 12 United States History assessment includes material from all time periods on the following topics:

- Change and Continuity in American Democracy: Ideas, Institutions, Events, Key Figures, and Controversies
- The Gathering and Interactions of Peoples, Cultures, and Ideas
- Economic and Technological Changes and Their Relationship to Society, Ideas, and the Environment
- The Changing Role of America in the World

The NAEP frameworks for United States History may be accessed at http://www.nagb.org/content/nagb/assets/documents/publications/frameworks/historyframework.pdf

**Instructional Practices:**
Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to

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| | comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (115)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |

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| **LACC.1112.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole. |
| **LACC.1112.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas. |
| **LACC.1112.RH.1.3:** | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain. |
| **LACC.1112.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10). |
| **LACC.1112.RH.2.5:** | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole. |
| **LACC.1112.RH.2.6:** | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence. |
| **LACC.1112.RH.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| **LACC.1112.RH.3.8:** | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information. |
| **LACC.1112.RH.3.9:** | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources. |
| **LACC.1112.RH.4.10:** | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently. |
| **SS.912.A.1.2:** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |
| **SS.912.A.1.3:** | Utilize timelines to identify the time sequence of historical data. |
| **SS.912.A.1.4:** | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time |

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| | periods and events from the past. |
| SS.912.A.1.5: | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| LACC.1112.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| LACC.1112.SL.1.2: | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies |

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| | among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **SS.912.A.1.6:** | Use case studies to explore social, political, legal, and economic relationships in history. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. |

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| | a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, |

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| | purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.1.1:** | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| **SS.912.A.1.7:** | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| **SS.912.A.2.1:** | Review causes and consequences of the Civil War.<br>Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| **SS.912.A.2.2:** | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| **SS.912.A.2.3:** | Describe the issues that divided Republicans during the early Reconstruction era.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| **SS.912.A.2.4:** | Distinguish the freedoms guaranteed to African Americans and |

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| | other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| **SS.912.A.2.5:** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| **SS.912.A.2.6:** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States. |
| **SS.912.A.2.7:** | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |
| **SS.912.A.3.1:** | Analyze the economic challenges to American farmers and farmers' responses to these challenges in the mid to late 1800s.<br>Remarks/Examples<br>Examples may include, but are not limited to, creation of agricultural colleges, Morrill Land Grant Act, gold standard and Bimetallism, the creation of the Populist Party. |
| **SS.912.A.3.10:** | Review different economic and philosophic ideologies.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |
| **SS.912.A.3.11:** | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |

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| **SS.912.A.3.12:** | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, Women's Christian Temperance Union, National Women's Suffrage Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |
| **SS.912.A.3.13:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.2:** | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |
| **SS.912.A.3.3:** | Compare the first and second Industrial Revolutions in the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, trade, development of new industries. |
| **SS.912.A.3.4:** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |

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| **SS.912.A.3.5:** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6:** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.3.7:** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8:** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor). |
| **SS.912.A.3.9:** | Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |
| **SS.912.A.4.1:** | Analyze the major factors that drove United States imperialism.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Monroe |

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| | Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |
| **SS.912.A.4.10:** | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |
| **SS.912.A.4.11:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.2:** | Explain the motives of the United States acquisition of the territories.<br>Remarks/Examples<br>Examples may include, but are not limited to, Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| **SS.912.A.4.3:** | Examine causes, course, and consequences of the Spanish American War.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| **SS.912.A.4.4:** | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups |

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| | such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| **SS.912.A.4.5:** | Examine causes, course, and consequences of United States involvement in World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |
| **SS.912.A.4.6:** | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public Information). |
| **SS.912.A.4.7:** | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys). |
| **SS.912.A.4.8:** | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe. |
| **SS.912.A.4.9:** | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States. |
| **SS.912.A.5.1:** | Discuss the economic outcomes of demobilization. |
| **SS.912.A.5.10:** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| **SS.912.A.5.11:** | Examine causes, course, and consequences of the Great Depression and the New Deal. |
| **SS.912.A.5.12:** | Examine key events and people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in |

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| | 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| **SS.912.A.5.2:** | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| **SS.912.A.5.3:** | Examine the impact of United States foreign economic policy during the 1920s.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |
| **SS.912.A.5.4:** | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices. |
| **SS.912.A.5.5:** | Describe efforts by the United States and other world powers to avoid future wars.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| **SS.912.A.5.6:** | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s. |
| **SS.912.A.5.7:** | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women. |
| **SS.912.A.5.8:** | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience. |
| **SS.912.A.5.9:** | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, 100 Percent Americanism. |
| **SS.912.A.6.1:** | Examine causes, course, and consequences of World War II on the United States and the world.<br>Remarks/Examples<br>Examples may include, but are not limited to, riseof dictators, attack on Pearl Harbor, Nazi party, American neutrality, D-Day, Battle of the Bulge, War in the Pacific, internment camps, Holocaust, Yalta. |
| **SS.912.A.6.10:** | Examine causes, course, and consequences of the early years of the Cold War (Truman Doctrine, Marshall Plan, NATO, Warsaw Pact). |
| **SS.912.A.6.11:** | Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world. |
| **SS.912.A.6.12:** | Examine causes, course, and consequences of the Korean War.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Communist China, 38th parallel, cease fire, firing of Gen. Douglas McArthur. |
| **SS.912.A.6.13:** | Analyze significant foreign policy events during the Truman, Eisenhower, Kennedy, Johnson, and Nixon administrations.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Domino Theory, Sputnik, space race, Korean Conflict, Vietnam Conflict, U-2 and Gary Powers, Bay of Pigs invasion, Cuban Missile Crisis, Berlin Wall, Ping Pong Diplomacy, opening of China. |
| **SS.912.A.6.14:** | Analyze causes, course, and consequences of the Vietnam War.<br>Remarks/Examples<br>Examples may include, but are not lmited to, Geneva Accords, Gulf of Tonkin Resolution, the draft, escalating protest at home, Vietnamization, the War Powers Act. |
| **SS.912.A.6.15:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, Mosquito Fleet, "Double V Campaign", construction of military bases and WWII training centers, 1959 Cuban coup and its impact on Florida, development of the space program and NASA. |
| **SS.912.A.6.2:** | Describe the United States response in the early years of World War II (Neutrality Acts, Cash and Carry, Lend Lease Act). |
| **SS.912.A.6.3:** | Analyze the impact of the Holocaust during World War II on Jews as well as other groups. |
| **SS.912.A.6.4:** | Examine efforts to expand or contract rights for various populations during World War II.<br>Remarks/Examples<br>Examples may include, but are not limited to, women, African Americans, German Americans, Japanese Americans and their internment, Native Americans, Hispanic Americans, Italian Americans. |
| **SS.912.A.6.5:** | Explain the impact of World War II on domestic government policy.<br>Remarks/Examples<br>Examples may include, but are not limited to, rationing, national security, civil rights, increased job opportunities for African Americans, women, Jews, and other refugees. |
| **SS.912.A.6.6:** | Analyze the use of atomic weapons during World War II and the aftermath of the bombings. |
| **SS.912.A.6.7:** | Describe the attempts to promote international justice through the Nuremberg Trials. |
| **SS.912.A.6.8:** | Analyze the effects of the Red Scare on domestic United States policy.<br>Remarks/Examples<br>Examples may include, but are not limited to, loyalty review program, House Un-American Activities Committee, McCarthyism (Sen. Joe McCarthy), McCarran Act. |
| **SS.912.A.6.9:** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, the Declaration of Human Rights. |
| **SS.912.A.7.1:** | Identify causes for Post-World War II prosperity and its effects on American society.<br>Remarks/Examples<br>Examples may include, but are not limited to, G.I. Bill, Baby Boom, growth of suburbs, Beatnik movement, youth culture, religious revivalism (e.g., Billy Graham and Bishop Fulton J. Sheen), conformity of the 1950s and the protest in the 1960s. |
| **SS.912.A.7.10:** | Analyze the significance of Vietnam and Watergate on the government and people of the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, mistrust of government, reinforcement of freedom of the press, as well as checks and balances, *New York Times v. Nixon.* |
| **SS.912.A.7.11:** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12:** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.13:** | Analyze the attempts to extend New Deal legislation through the Great Society and the successes and failures of these programs to promote social and economic stability.<br>Remarks/Examples<br>Examples may include, but are not limited to, Civil Rights Act of |

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| | 1964, Voting Rights Act of 1965, War on Poverty, Medicare, Medicaid, Headstart. |
| **SS.912.A.7.14:** | Review the role of the United States as a participant in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| **SS.912.A.7.15:** | Analyze the effects of foreign and domestic terrorism on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, Oklahoma City bombing, attack of September 11, 2001, Patriot Act, wars in Afghanistan and Iraq. |
| **SS.912.A.7.16:** | Examine changes in immigration policy and attitudes toward immigration since 1950. |
| **SS.912.A.7.17:** | Examine key events and key people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.A.7.2:** | Compare the relative prosperity between different ethnic groups and social classes in the post-World War II period. |
| **SS.912.A.7.3:** | Examine the changing status of women in the United States from post-World War II to present.<br>Remarks/Examples<br>Examples may include, but are not limited to, increased numbers of women in the workforce, Civil Rights Act of 1964, *The Feminine Mystique*, National Organization for Women, *Roe v. Wade,* Equal Rights Amendment, Title IX, Betty Freidan, Gloria Steinem, Phyllis |

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| | Schlafly, Billie Jean King, feminism. |
| **SS.912.A.7.4:** | Evaluate the success of 1960s era presidents' foreign and domestic policies.<br>Remarks/Examples<br>Examples may include, but are not limited to, civil rights legislation, Space Race, Great Society, War on Poverty. |
| **SS.912.A.7.5:** | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| **SS.912.A.7.6:** | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement.<br>Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| **SS.912.A.7.7:** | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| **SS.912.A.7.8:** | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| **SS.912.A.7.9:** | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s. |
| **SS.912.G.1.2:** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| **SS.912.G.2.1:** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br><br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.H.1.1:** | Relate works in the arts (architecture, dance, music, theatre, and visual arts) of varying styles and genre according to the periods in which they were created.<br>Remarks/Examples<br>Examples are Bronze Age, Ming Dynasty, Classical, Renaissance, Modern, and Contemporary. |
| **SS.912.H.1.3:** | Relate works in the arts to various cultures.<br>Remarks/Examples<br>Examples are African, Asian, Oceanic, European, the Americas, Middle Eastern, Egyptian, Greek, Roman. |

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| **SS.912.H.1.5:** | Examine artistic response to social issues and new ideas in various cultures.<br>Remarks/Examples<br>Examples are Victor Hugo's Les Miserables, Langston Hughes' poetry, Pete Seeger's Bring 'Em Home. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |

# Course: United States History- 2100310

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4475.aspx

## BASIC INFORMATION

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| **Course Title:** | United States History |
| **Course Number:** | 2100310 |
| **Course Abbreviated Title:** | US HIST |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **United States History (U.S. History) 9-12 Course** - The grade 9-12 United States History course consists of the following content area strands: United States History, Geography, and Humanities. The primary content emphasis for this course pertains to the study of United States history from Reconstruction to the present day. Students will be exposed to the historical, geographic, political, economic, and sociological events which influenced the development of the United States and the resulting impact on world history. So that students can |

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| | clearly see the relationship between cause and effect in historical events, students should have the opportunity to review those fundamental ideas and events which occurred before the end of Reconstruction.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Special Notes:** Additional content that may be contained in the NAEP Grade 12 United States History assessment includes material <u>from all time periods</u> on the following topics:<br><br>• Change and Continuity in American Democracy: Ideas, Institutions, Events, Key Figures, and Controversies<br>• The Gathering and Interactions of Peoples, Cultures, and Ideas<br>• Economic and Technological Changes and Their Relationship to Society, Ideas, and the Environment<br>• The Changing Role of America in the World<br><br>The NAEP frameworks for United States History may be accessed at http://www.nagb.org/content/nagb/assets/documents/publications/frameworks/historyframework.pdf<br><br>**Instructional Practices:** Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (115)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
MACC.912.S-ID.1:Summarize, represent and interpret data on a single count or measurement variable.

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

**HE.912.C.2 Internal and External Influence - Analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.**

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| **HE.912.C.2.4 :** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 04/13<br>Belongs to: Internal and External Influence - Analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |

**LACC.1112.RH.1 Key Ideas and Details**

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| **LACC.1112.RH.1.1 :** | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Key Ideas and Details |
| **LACC.1112.RH.1.2 :** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date |

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| | Adopted or Revised: 12/10<br>Belongs to: Key Ideas and Details |
| **LACC.1112.RH.1.3 :** | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts I Date Adopted or Revised: 12/10<br>Belongs to: Key Ideas and Details |

## LACC.1112.RH.2 Craft and Structure

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| **LACC.1112.RH.2.4 :** | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts I Date Adopted or Revised: 12/10<br>Belongs to: Craft and Structure |
| **LACC.1112.RH.2.5 :** | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Craft and Structure |
| **LACC.1112.RH.2.6 :** | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Craft and Structure |

## LACC.1112.RH.3 Integration of Knowledge and Ideas

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| **LACC.1112.RH.3.7 :** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Integration of Knowledge and Ideas |
| **LACC.1112.RH.3.8 :** | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10 |

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| | Belongs to: Integration of Knowledge and Ideas |
| **LACC.1112.RH.3.9 :** | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Integration of Knowledge and Ideas |

## LACC.1112.RH.4 Range of Reading and Level of Text Complexity

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| **LACC.1112.RH.4.10 :** | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Range of Reading and Level of Text Complexity |

## SS.912.A.1 Use research and inquiry skills to analyze American history using primary and secondary sources.

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| **SS.912.A.1.2 :** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| **SS.912.A.1.3 :** | Utilize timelines to identify the time sequence of historical data.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| **SS.912.A.1.4 :** | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| **SS.912.A.1.5 :** | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources.<br>Remarks/Examples |

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| | Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| SS.912.A.1.6 : | Use case studies to explore social, political, legal, and economic relationships in history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| SS.912.A.1.1 : | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| SS.912.A.1.7 : | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |

## LACC.1112.SL.1 Comprehension and Collaboration

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| LACC.1112.SL.1.1 : | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed. |

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| | c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.<br><br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Comprehension and Collaboration |
| **LACC.1112.SL.1.2 :** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Comprehension and Collaboration |
| **LACC.1112.SL.1.3 :** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Comprehension and Collaboration |

## LACC.1112.SL.2 Presentation of Knowledge and Ideas

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| **LACC.1112.SL.2.4 :** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Presentation of Knowledge and Ideas |

## LACC.1112.WHST.1 Text Types and Purposes

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| **LACC.1112.WHST.1.1 :** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented.<br><br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Text Types and Purposes |
| **LACC.1112.WHST.1.2 :** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and |

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| | examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).<br><br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Text Types and Purposes |

## LACC.1112.WHST.2 Production and Distribution of Writing

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| **LACC.1112.WHST.2.4 :** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Production and Distribution of Writing |
| **LACC.1112.WHST.2.5 :** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Production and Distribution of Writing |
| **LACC.1112.WHST.2.6 :** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Production and Distribution of Writing |

## LACC.1112.WHST.3 Research to Build and Present Knowledge

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| LACC.1112.WHST.3.7 : | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.<br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Research to Build and Present Knowledge |
| LACC.1112.WHST.3.8 : | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.<br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Research to Build and Present Knowledge |
| LACC.1112.WHST.3.9 : | Draw evidence from informational texts to support analysis, reflection, and research.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Research to Build and Present Knowledge |

## LACC.1112.WHST.4 Range of Writing

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| LACC.1112.WHST.4.10 : | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Range of Writing |

## SS.912.A.2 Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.

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| SS.912.A.2.1 : | Review causes and consequences of the Civil War.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| SS.912.A.2.2 : | Assess the influence of significant people or groups on Reconstruction.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| SS.912.A.2.3 : | Describe the issues that divided Republicans during the early Reconstruction era.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| SS.912.A.2.4 : | Distinguish the freedoms guaranteed to African Americans and other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| SS.912.A.2.5 : | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |

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| | Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people. |
| **SS.912.A.2.6 :** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people. |
| **SS.912.A.2.7 :** | Review the Native American experience.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |

## SS.912.A.3 Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.

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| **SS.912.A.3.1 :** | Analyze the economic challenges to American farmers and farmers' responses to these challenges in the mid to late 1800s.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, creation of agricultural colleges, Morrill Land Grant Act, gold standard and Bimetallism, the creation of the Populist Party. |
| **SS.912.A.3.10 :** | Review different economic and philosophic ideologies.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |

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| **SS.912.A.3.11 :** | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |
| **SS.912.A.3.12 :** | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, Women's Christian Temperance Union, National Women's Suffrage Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |
| **SS.912.A.3.13 :** | Examine key events and peoples in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.2 :** | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution. |
| **SS.912.A.3.3 :** | Compare the first and second Industrial Revolutions in the United States.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, trade, development of new industries. |
| **SS.912.A.3.4 :** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.5 :** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6 :** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08 |

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| | Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.3.7 :** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8 :** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution. |
| **SS.912.A.3.9 :** | Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |

## SS.912.A.4 Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.

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| **SS.912.A.4.1 :** | Analyze the major factors that drove United States imperialism. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: [Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.]()<br>Remarks/Examples<br>Examples may include, but are not limited to, the Monroe Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |
| **SS.912.A.4.10 :** | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: [Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.]()<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |
| **SS.912.A.4.11 :** | Examine key events and peoples in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: [Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.]()<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.2 :** | Explain the motives of the United States acquisition of the territories.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: [Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.]()<br>Remarks/Examples<br>Examples may include, but are not limited to, Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| **SS.912.A.4.3 :** | Examine causes, course, and consequences of the Spanish |

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| | American War.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| **SS.912.A.4.4 :** | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| **SS.912.A.4.5 :** | Examine causes, course, and consequences of United States involvement in World War I.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |
| **SS.912.A.4.6 :** | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public Information).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United |

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| | States in world affairs through the end of World War I. |
| **SS.912.A.4.7 :** | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I. |
| **SS.912.A.4.8 :** | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I. |
| **SS.912.A.4.9 :** | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I. |

## SS.912.A.5 Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.

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| **SS.912.A.5.1 :** | Discuss the economic outcomes of demobilization.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.10 :** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.11 :** | Examine causes, course, and consequences of the Great Depression and the New Deal.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.12 :** | Examine key events and people in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic |

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| | conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| **SS.912.A.5.2 :** | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| **SS.912.A.5.3 :** | Examine the impact of United States foreign economic policy during the 1920s.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |
| **SS.912.A.5.4 :** | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.5 :** | Describe efforts by the United States and other world powers to avoid future wars.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, |

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| | Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| **SS.912.A.5.6 :** | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.7 :** | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.8 :** | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.9 :** | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |

## SS.912.A.6 Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.

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| **SS.912.A.6.1 :** | Examine causes, course, and consequences of World War II on the United States and the world.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, riseof dictators, attack on Pearl Harbor, Nazi party, American neutrality, D-Day, Battle of the Bulge, War in the Pacific, internment camps, Holocaust, Yalta. |
| **SS.912.A.6.10 :** | Examine causes, course, and consequences of the early years of the Cold War (Truman Doctrine, Marshall Plan, NATO, Warsaw Pact).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.11 :** | Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.12 :** | Examine causes, course, and consequences of the Korean War.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Communist China, 38th parallel, cease fire, firing of Gen. Douglas McArthur. |
| **SS.912.A.6.13 :** | Analyze significant foreign policy events during the Truman, Eisenhower, Kennedy, Johnson, and Nixon administrations.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Domino Theory, Sputnik, space race, Korean Conflict, Vietnam Conflict, U-2 and Gary Powers, Bay of Pigs invasion, Cuban Missile Crisis, Berlin Wall, Ping Pong Diplomacy, opening of China. |
| **SS.912.A.6.14 :** | Analyze causes, course, and consequences of the Vietnam War. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not lmited to, Geneva Accords, Gulf of Tonkin Resolution, the draft, escalating protest at home, Vietnamization, the War Powers Act. |
| **SS.912.A.6.15 :** | Examine key events and peoples in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, Mosquito Fleet, "Double V Campaign", construction of military bases and WWII training centers, 1959 Cuban coup and its impact on Florida, development of the space program and NASA. |
| **SS.912.A.6.2 :** | Describe the United States response in the early years of World War II (Neutrality Acts, Cash and Carry, Lend Lease Act).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.3 :** | Analyze the impact of the Holocaust during World War II on Jews as well as other groups.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.4 :** | Examine efforts to expand or contract rights for various populations during World War II.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, women, African Americans, German Americans, Japanese Americans and their |

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| | internment, Native Americans, Hispanic Americans, Italian Americans. |
| **SS.912.A.6.5 :** | Explain the impact of World War II on domestic government policy.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, rationing, national security, civil rights, increased job opportunities for African Americans, women, Jews, and other refugees. |
| **SS.912.A.6.6 :** | Analyze the use of atomic weapons during World War II and the aftermath of the bombings.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.7 :** | Describe the attempts to promote international justice through the Nuremberg Trials.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.8 :** | Analyze the effects of the Red Scare on domestic United States policy.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, loyalty review program, House Un-American Activities Committee, McCarthyism (Sen. Joe McCarthy), McCarran Act. |
| **SS.912.A.6.9 :** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the |

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| | post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Declaration of Human Rights. |

## SS.912.A.7 Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.

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| **SS.912.A.7.1 :** | Identify causes for Post-World War II prosperity and its effects on American society.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, G.I. Bill, Baby Boom, growth of suburbs, Beatnik movement, youth culture, religious revivalism (e.g., Billy Graham and Bishop Fulton J. Sheen), conformity of the 1950s and the protest in the 1960s. |
| **SS.912.A.7.10 :** | Analyze the significance of Vietnam and Watergate on the government and people of the United States.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, mistrust of government, reinforcement of freedom of the press, as well as checks and balances, *New York Times v. Nixon.* |
| **SS.912.A.7.11 :** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia- |

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| | Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12 :** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.13 :** | Analyze the attempts to extend New Deal legislation through the Great Society and the successes and failures of these programs to promote social and economic stability.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Civil Rights Act of 1964, Voting Rights Act of 1965, War on Poverty, Medicare, Medicaid, Headstart. |
| **SS.912.A.7.14 :** | Review the role of the United States as a participant  in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| **SS.912.A.7.15 :** | Analyze the effects of foreign and domestic terrorism on the American people. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Oklahoma City bombing, attack of September 11, 2001, Patriot Act, wars in Afghanistan and Iraq. |
| **SS.912.A.7.16 :** | Examine changes in immigration policy and attitudes toward immigration since 1950.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life. |
| **SS.912.A.7.17 :** | Examine key events and key people in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.A.7.2 :** | Compare the relative prosperity between different ethnic groups and social classes in the post-World War II period.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life. |
| **SS.912.A.7.3 :** | Examine the changing status of women in the United States from post-World War II to present.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, increased numbers of women in the workforce, Civil Rights Act of 1964, *The Feminine Mystique*, National Organization for Women, *Roe v. Wade,* Equal Rights Amendment, Title IX, Betty Freidan, Gloria Steinem, Phyllis Schlafly, Billie Jean King, feminism. |
| **SS.912.A.7.4 :** | Evaluate the success of 1960s era presidents' foreign and domestic policies.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, civil rights legislation, Space Race, Great Society, War on Poverty. |
| **SS.912.A.7.5 :** | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| **SS.912.A.7.6 :** | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely |

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| | Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| **SS.912.A.7.7 :** | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| **SS.912.A.7.8 :** | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| **SS.912.A.7.9 :** | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life. |

## SS.912.G.1 Understand how to use maps and other geographic representations, tools, and technology to report information.

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| **SS.912.G.1.2 :** | Use spatial perspective and appropriate geographic terms and |

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| | tools, including the Six Essential Elements, as organizational schema to describe any given place.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand how to use maps and other geographic representations, tools, and technology to report information. |
| **SS.912.G.1.3 :** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand how to use maps and other geographic representations, tools, and technology to report information. |

## SS.912.G.2 Understand physical and cultural characteristics of places.

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| **SS.912.G.2.1 :** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand physical and cultural characteristics of places.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources.<br>Examples of human characteristics are religion, government, economy, demography. |

## SS.912.G.4 Understand the characteristics, distribution, and migration of human populations.

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| **SS.912.G.4.2 :** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |
| **SS.912.G.4.3 :** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |

## SS.912.H.1 Identify and analyze the historical, social, and cultural contexts of the arts.

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| **SS.912.H.1.1 :** | Relate works in the arts (architecture, dance, music, theatre, and visual arts) of varying styles and genre according to the periods in which they were created.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Identify and analyze the historical, social, and cultural contexts of the arts.<br>Remarks/Examples<br>Examples are Bronze Age, Ming Dynasty, Classical, Renaissance, Modern, and Contemporary. |
| **SS.912.H.1.3 :** | Relate works in the arts to various cultures.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Identify and analyze the historical, social, and cultural contexts of the arts.<br>Remarks/Examples<br>Examples are African, Asian, Oceanic, European, the Americas, Middle Eastern, Egyptian, Greek, Roman. |
| **SS.912.H.1.5 :** | Examine artistic response to social issues and new ideas in various cultures.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Identify and analyze the historical, social, and cultural contexts of the arts.<br>Remarks/Examples<br>Examples are Victor Hugo's Les Miserables, Langston Hughes' poetry, Pete Seeger's Bring 'Em Home. |

## SS.912.H.3 Understand how transportation, trade, communication, science, and technology influence the progression and regression of cultures.

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| **SS.912.H.3.1 :** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how transportation, trade, communication, science, and technology influence the progression and regression of cultures. |

# Course: Visions & Their Pursuits:An AmerTrad-U.S. Hist to 1920 Honors- 2100470

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4493.aspx

## BASIC INFORMATION

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| **Course Title:** | Visions & Their Pursuits:An AmerTrad-U.S. Hist to 1920 Honors |
| **Course Number:** | 2100470 |
| **Course Abbreviated Title:** | VISIONS/PURSUITS HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | **Visions and Their Pursuits: An American Tradition-U.S.History to 1920** - The grade 9-12 Visions and Their Pursuits course consists of the following content area strands: World History, American History, Civics and Government, Geography, and Humanities. The primary content emphasis for this course pertains to the chronological study of the United States during the period of European exploration through World War I and the collective vision of historical time periods. Content will include, but is not limited to, the foundation and early development of the United States as organized by the visions of those who participated in the revolutions leading to the establishment and early success of the United States, the political, social, cultural, intellectual, and technological revolutions of the United States, the structure and function of political divisions, the |

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| | organization of the federal government as outlined in the U.S. Constitution, the impact of economic, social, and political changes on traditional American values, reactions to changes, and growth of sectionalism, the failure of previous visions, and the emergence of an industrial, urban and pluralistic society that demands new visions to carry the nation forward.<br><br>**Honors/Advanced** courses offer scaffolded learning opportunities for students to develop the critical skills of analysis, synthesis, and evaluation in a more rigorous and reflective academic setting. Students are empowered to perform at higher levels as they engage in the following: analyzing historical documents and supplementary readings, working in the context of thematically categorized information, becoming proficient in note-taking, participating in Socratic seminars/discussions, emphasizing free-response and document-based writing, contrasting opposing viewpoints, solving problems, etc. Students will develop and demonstrate their skills through participation in a capstone and/or extended research-based paper/project (e.g., history fair, participatory citizenship project, mock congressional hearing, projects for competitive evaluation, investment portfolio contests, or other teacher-directed projects).<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing |

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| | opportunities (claims and evidence). |

## STANDARDS (104)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| **LACC.910.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| **LACC.910.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
| **LACC.910.RH.1.3:** | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |

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| **LACC.910.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| **LACC.910.RH.2.5:** | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| **LACC.910.RH.2.6:** | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| **LACC.910.RH.3.7:** | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| **LACC.910.RH.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author's claims. |
| **LACC.910.RH.3.9:** | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| **LACC.910.RH.4.10:** | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the |

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| | evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and |

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| | information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the |

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| | usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.1.1:** | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| **SS.912.A.1.2:** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |
| **SS.912.A.1.3:** | Utilize timelines to identify the time sequence of historical data. |
| **SS.912.A.1.4:** | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| **SS.912.A.1.5:** | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| **SS.912.A.1.6:** | Use case studies to explore social, political, legal, and economic relationships in history. |
| **SS.912.A.1.7:** | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| **SS.912.A.2.1:** | Review causes and consequences of the Civil War.<br>Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, |

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| | territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| SS.912.A.2.2: | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| SS.912.A.2.3: | Describe the issues that divided Republicans during the early Reconstruction era.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| SS.912.A.2.4: | Distinguish the freedoms guaranteed to African Americans and other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| SS.912.A.2.5: | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| SS.912.A.2.6: | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States. |
| SS.912.A.2.7: | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |

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| SS.912.A.3.10: | Review different economic and philosophic ideologies.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |
| SS.912.A.3.11: | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |
| SS.912.A.3.12: | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, Women's Christian Temperance Union, National Women's Suffrage Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |
| SS.912.A.3.13: | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| SS.912.A.3.2: | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |
| SS.912.A.3.4: | Determine how the development of steel, oil, transportation, |

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| | communication, and business practices affected the United States economy.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.5:** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6:** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.3.7:** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8:** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor). |
| **SS.912.A.3.9:** | Examine causes, course, and consequences of the labor movement in |

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| | the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |
| **SS.912.A.4.1:** | Analyze the major factors that drove United States imperialism.<br>Remarks/Examples<br>Examples may include, but are not limited to,  the Monroe Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |
| **SS.912.A.4.10:** | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |
| **SS.912.A.4.11:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.2:** | Explain the motives of the United States acquisition of the territories.<br>Remarks/Examples<br>Examples may include, but are not limited to,  Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| **SS.912.A.4.3:** | Examine causes, course, and consequences of the Spanish American War.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of |

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| | territories, the Treaty of Paris. |
| **SS.912.A.4.4:** | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| **SS.912.A.4.5:** | Examine causes, course, and consequences of United States involvement in World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |
| **SS.912.A.4.6:** | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public Information). |
| **SS.912.A.4.7:** | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys). |
| **SS.912.A.4.8:** | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe. |
| **SS.912.A.4.9:** | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States. |
| **SS.912.A.5.1:** | Discuss the economic outcomes of demobilization. |
| **SS.912.A.5.10:** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| **SS.912.A.5.11:** | Examine causes, course, and consequences of the Great Depression |

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| | and the New Deal. |
| SS.912.A.5.12: | Examine key events and people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| SS.912.A.5.2: | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| SS.912.A.5.3: | Examine the impact of United States foreign economic policy during the 1920s.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |
| SS.912.A.5.4: | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices. |
| SS.912.A.5.5: | Describe efforts by the United States and other world powers to avoid future wars.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| SS.912.A.5.6: | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s. |
| SS.912.A.5.7: | Examine the freedom movements that advocated civil rights for |

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| | African Americans, Latinos, Asians, and women. |
| **SS.912.A.5.8:** | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience. |
| **SS.912.A.5.9:** | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |
| **SS.912.C.1.1:** | Evaluate, take, and defend positions on the founding ideals and principles in American Constitutional government. |
| **SS.912.C.1.2:** | Explain how the Declaration of Independence reflected the political principles of popular sovereignty, social contract, natural rights, and individual rights. |
| **SS.912.C.1.3:** | Evaluate the ideals and principles of the founding documents (Declaration of Independence, Articles of Confederation, Federalist Papers) that shaped American Democracy. |
| **SS.912.C.1.4:** | Analyze and categorize the diverse viewpoints presented by the Federalists and the Anti-Federalists concerning ratification of the Constitution and inclusion of a bill of rights. |
| **SS.912.C.1.5:** | Evaluate how the Constitution and its amendments reflect the political principles of rule of law, checks and balances, separation of powers, republicanism, democracy, and federalism. |
| **SS.912.C.3.2:** | Define federalism, and identify examples of the powers granted and denied to states and the national government in the American federal system of government. |
| **SS.912.C.3.3:** | Analyze the structures, functions, and processes of the legislative branch as described in Article I of the Constitution. |
| **SS.912.C.3.4:** | Analyze the structures, functions, and processes of the executive branch as described in Article II of the Constitution. |
| **SS.912.C.3.5:** | Identify the impact of independent regulatory agencies in the federal bureaucracy.<br>Remarks/Examples<br>Examples are Federal Reserve, Food and Drug Administration, Federal Communications Commission. |

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| SS.912.C.3.6: | Analyze the structures, functions, and processes of the judicial branch as described in Article III of the Constitution. |
| SS.912.G.1.1: | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| SS.912.G.1.2: | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| SS.912.G.1.3: | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| SS.912.G.1.4: | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| SS.912.G.2.1: | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| SS.912.G.2.2: | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| SS.912.G.2.3: | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| SS.912.G.4.1: | Interpret population growth and other demographic data for any given place. |

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| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.G.4.7:** | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |
| **SS.912.G.4.9:** | Use political maps to describe the change in boundaries and governments within continents over time. |
| **SS.912.H.1.4:** | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| **SS.912.H.3.2:** | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture. |
| **SS.912.W.1.1:** | Use timelines to establish cause and effect relationships of historical events. |
| **SS.912.W.1.2:** | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| **SS.912.W.1.3:** | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| **SS.912.W.1.4:** | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |

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| **SS.912.W.1.5:** | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| **SS.912.W.1.6:** | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |
| **SS.912.W.4.11:** | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors. |

# Course: Visions: Europe,U.S.,World Honors-2100480

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4502.aspx

## BASIC INFORMATION

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| **Course Title:** | Visions: Europe,U.S.,World Honors |
| **Course Number:** | 2100480 |
| **Course Abbreviated Title:** | VISIONS/COUNTER HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | **Visions and Countervisions: Europe,the U.S. and the World from 1848** - The grade 9-12 Visions and Countervisions course consists of the following content area strands: World History, American History, Geography, and Humanities. The primary content emphasis for this course pertains to the chronological study of major concepts and trends evidenced in the United States, Europe, and the world from 1848 to the present. Content should include, but is not limited to, the visions of revolution, nationalism, and imperialism evidenced in European history from 1848 to 1918, international politics from 1918 to 1945 emphasizing post-war Europe, cultural identities following nationalist and independent movements, the development and rise of communism, domestic issues affecting the United States from 1880 to the present, and the United States economic, political, and |

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| | social policies and their effects on the world from 1898 to the present.<br><br>**Honors/Advanced** courses offer scaffolded learning opportunities for students to develop the critical skills of analysis, synthesis, and evaluation in a more rigorous and reflective academic setting. Students are empowered to perform at higher levels as they engage in the following: analyzing historical documents and supplementary readings, working in the context of thematically categorized information, becoming proficient in note-taking, participating in Socratic seminars/discussions, emphasizing free-response and document-based writing, contrasting opposing viewpoints, solving problems, etc. Students will develop and demonstrate their skills through participation in a capstone and/or extended research-based paper/project (e.g., history fair, participatory citizenship project, mock congressional hearing, projects for competitive evaluation, investment portfolio contests, or other teacher-directed projects).<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (128)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| **LACC.1112.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole. |
| **LACC.1112.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas. |
| **LACC.1112.RH.1.3:** | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain. |
| **LACC.1112.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10). |

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| LACC.1112.RH.2.5: | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole. |
| LACC.1112.RH.2.6: | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence. |
| LACC.1112.RH.3.7: | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem. |
| LACC.1112.RH.3.8: | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information. |
| LACC.1112.RH.3.9: | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources. |
| LACC.1112.RH.4.10: | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently. |
| LACC.1112.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to |

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| | deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |

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| SS.912.A.5.11: | Examine causes, course, and consequences of the Great Depression and the New Deal. |
| LACC.1112.WHST.1.2: | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| LACC.1112.WHST.2.4: | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| LACC.1112.WHST.2.5: | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| LACC.1112.WHST.2.6: | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| LACC.1112.WHST.3.7: | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; |

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| | narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| LACC.1112.WHST.3.8: | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| LACC.1112.WHST.3.9: | Draw evidence from informational texts to support analysis, reflection, and research. |
| LACC.1112.WHST.4.10: | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| SS.912.A.1.1: | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| SS.912.A.1.2: | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |
| SS.912.A.1.3: | Utilize timelines to identify the time sequence of historical data. |
| SS.912.A.1.4: | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| SS.912.A.1.5: | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| SS.912.A.1.6: | Use case studies to explore social, political, legal, and economic |

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| | relationships in history. |
| **SS.912.A.1.7:** | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| **SS.912.A.2.1:** | Review causes and consequences of the Civil War.<br>Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| **SS.912.A.2.2:** | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| **SS.912.A.2.3:** | Describe the issues that divided Republicans during the early Reconstruction era.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| **SS.912.A.2.4:** | Distinguish the freedoms guaranteed to African Americans and other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| **SS.912.A.2.5:** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| **SS.912.A.2.6:** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States. |

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| **SS.912.A.2.7:** | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |
| **SS.912.A.3.1:** | Analyze the economic challenges to American farmers and farmers' responses to these challenges in the mid to late 1800s.<br>Remarks/Examples<br>Examples may include, but are not limited to, creation of agricultural colleges, Morrill Land Grant Act, gold standard and Bimetallism, the creation of the Populist Party. |
| **SS.912.A.3.10:** | Review different economic and philosophic ideologies.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |
| **SS.912.A.3.11:** | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |
| **SS.912.A.3.12:** | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, Women's Christian Temperance Union, National Women's Suffrage Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |

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| **SS.912.A.3.13:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.2:** | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |
| **SS.912.A.3.3:** | Compare the first and second Industrial Revolutions in the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, trade, development of new industries. |
| **SS.912.A.3.4:** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.5:** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6:** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.3.7:** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8:** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor). |
| **SS.912.A.3.9:** | Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |
| **SS.912.A.4.1:** | Analyze the major factors that drove United States imperialism.<br>Remarks/Examples<br>Examples may include, but are not limited to,  the Monroe Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |
| **SS.912.A.4.10:** | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |

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| **SS.912.A.4.11:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.2:** | Explain the motives of the United States acquisition of the territories.<br>Remarks/Examples<br>Examples may include, but are not limited to, Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| **SS.912.A.4.3:** | Examine causes, course, and consequences of the Spanish American War.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| **SS.912.A.4.4:** | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| **SS.912.A.4.5:** | Examine causes, course, and consequences of United States involvement in World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |

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| SS.912.A.4.6: | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public Information). |
| SS.912.A.4.7: | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys). |
| SS.912.A.4.8: | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe. |
| SS.912.A.4.9: | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States. |
| SS.912.A.5.1: | Discuss the economic outcomes of demobilization. |
| SS.912.A.5.10: | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| SS.912.A.5.12: | Examine key events and people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| SS.912.A.5.2: | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| SS.912.A.5.3: | Examine the impact of United States foreign economic policy during the 1920s.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of |

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| | 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |
| SS.912.A.5.4: | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices. |
| SS.912.A.5.5: | Describe efforts by the United States and other world powers to avoid future wars.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| SS.912.A.5.6: | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s. |
| SS.912.A.5.7: | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women. |
| SS.912.A.5.8: | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience. |
| SS.912.A.5.9: | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |
| SS.912.A.6.1: | Examine causes, course, and consequences of World War II on the United States and the world.<br>Remarks/Examples<br>Examples may include, but are not limited to, riseof dictators, attack on Pearl Harbor, Nazi party, American neutrality, D-Day, Battle of the Bulge, War in the Pacific, internment camps, Holocaust, Yalta. |
| SS.912.A.6.10: | Examine causes, course, and consequences of the early years of the Cold War (Truman Doctrine, Marshall Plan, NATO, Warsaw Pact). |

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| SS.912.A.6.11: | Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world. |
| SS.912.A.6.12: | Examine causes, course, and consequences of the Korean War.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Communist China, 38th parallel, cease fire, firing of Gen. Douglas McArthur. |
| SS.912.A.6.13: | Analyze significant foreign policy events during the Truman, Eisenhower, Kennedy, Johnson, and Nixon administrations.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Domino Theory, Sputnik, space race, Korean Conflict, Vietnam Conflict, U-2 and Gary Powers, Bay of Pigs invasion, Cuban Missile Crisis, Berlin Wall, Ping Pong Diplomacy, opening of China. |
| SS.912.A.6.14: | Analyze causes, course, and consequences of the Vietnam War.<br>Remarks/Examples<br>Examples may include, but are not lmited to, Geneva Accords, Gulf of Tonkin Resolution, the draft, escalating protest at home, Vietnamization, the War Powers Act. |
| SS.912.A.6.15: | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Mosquito Fleet, "Double V Campaign", construction of military bases and WWII training centers, 1959 Cuban coup and its impact on Florida, development of the space program and NASA. |
| SS.912.A.6.2: | Describe the United States response in the early years of World War II (Neutrality Acts, Cash and Carry, Lend Lease Act). |
| SS.912.A.6.3: | Analyze the impact of the Holocaust during World War II on Jews as well as other groups. |
| SS.912.A.6.4: | Examine efforts to expand or contract rights for various populations during World War II.<br>Remarks/Examples<br>Examples may include, but are not limited to, women, African |

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| | Americans, German Americans, Japanese Americans and their internment, Native Americans, Hispanic Americans, Italian Americans. |
| **SS.912.A.6.5:** | Explain the impact of World War II on domestic government policy.<br>Remarks/Examples<br>Examples may include, but are not limited to, rationing, national security, civil rights, increased job opportunities for African Americans, women, Jews, and other refugees. |
| **SS.912.A.6.6:** | Analyze the use of atomic weapons during World War II and the aftermath of the bombings. |
| **SS.912.A.6.7:** | Describe the attempts to promote international justice through the Nuremberg Trials. |
| **SS.912.A.6.8:** | Analyze the effects of the Red Scare on domestic United States policy.<br>Remarks/Examples<br>Examples may include, but are not limited to, loyalty review program, House Un-American Activities Committee, McCarthyism (Sen. Joe McCarthy), McCarran Act. |
| **SS.912.A.6.9:** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Declaration of Human Rights. |
| **SS.912.A.7.1:** | Identify causes for Post-World War II prosperity and its effects on American society.<br>Remarks/Examples<br>Examples may include, but are not limited to, G.I. Bill, Baby Boom, growth of suburbs, Beatnik movement, youth culture, religious revivalism (e.g., Billy Graham and Bishop Fulton J. Sheen), conformity of the 1950s and the protest in the 1960s. |
| **SS.912.A.7.10:** | Analyze the significance of Vietnam and Watergate on the government and people of the United States. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, mistrust of government, reinforcement of freedom of the press, as well as checks and balances, *New York Times v. Nixon.* |
| **SS.912.A.7.11:** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12:** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.13:** | Analyze the attempts to extend New Deal legislation through the Great Society and the successes and failures of these programs to promote social and economic stability.<br>Remarks/Examples<br>Examples may include, but are not limited to, Civil Rights Act of 1964, Voting Rights Act of 1965, War on Poverty, Medicare, Medicaid, Headstart. |
| **SS.912.A.7.14:** | Review the role of the United States as a participant in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| **SS.912.A.7.15:** | Analyze the effects of foreign and domestic terrorism on the American people.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, Oklahoma City bombing, attack of September 11, 2001, Patriot Act, wars in Afghanistan and Iraq. |
| **SS.912.A.7.16:** | Examine changes in immigration policy and attitudes toward immigration since 1950. |
| **SS.912.A.7.17:** | Examine key events and key people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.A.7.2:** | Compare the relative prosperity between different ethnic groups and social classes in the post-World War II period. |
| **SS.912.A.7.3:** | Examine the changing status of women in the United States from post-World War II to present.<br>Remarks/Examples<br>Examples may include, but are not limited to, increased numbers of women in the workforce, Civil Rights Act of 1964, *The Feminine Mystique*, National Organization for Women, *Roe v. Wade,* Equal Rights Amendment, Title IX, Betty Freidan, Gloria Steinem, Phyllis Schlafly, Billie Jean King, feminism. |
| **SS.912.A.7.4:** | Evaluate the success of 1960s era presidents' foreign and domestic policies.<br>Remarks/Examples<br>Examples may include, but are not limited to, civil rights legislation, Space Race, Great Society, War on Poverty. |
| **SS.912.A.7.5:** | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| SS.912.A.7.6: | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement.<br>Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| SS.912.A.7.7: | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| SS.912.A.7.8: | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Remarks/Examples<br>Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| SS.912.A.7.9: | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s. |
| SS.912.G.1.1: | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| SS.912.G.1.2: | Use spatial perspective and appropriate geographic terms and tools, |

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| | including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| **SS.912.G.1.4:** | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| **SS.912.G.2.1:** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| **SS.912.G.2.3:** | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| **SS.912.G.4.1:** | Interpret population growth and other demographic data for any given place. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.G.4.7:** | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |

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| SS.912.G.4.9: | Use political maps to describe the change in boundaries and governments within continents over time. |
| SS.912.H.1.4: | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| SS.912.H.3.1: | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| SS.912.H.3.2: | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture. |
| SS.912.W.1.1: | Use timelines to establish cause and effect relationships of historical events. |
| SS.912.W.1.2: | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| SS.912.W.1.3: | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| SS.912.W.1.4: | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| SS.912.W.1.5: | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| SS.912.W.1.6: | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |

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| **SS.912.W.4.11:** | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors. |

# Course: The History of The Vietnam War-2100400

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4484.aspx

## BASIC INFORMATION

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| **Course Title:** | The History of The Vietnam War |
| **Course Number:** | 2100400 |
| **Course Abbreviated Title:** | HIST OF VIETNAM WAR |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | Half credit (.5) |
| **Course length:** | Semester (S) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **The History of Vietnam** – The grade 9-12 The History of Vietnam course consists of the following content area strands: United States History, World History, Civics and Government, Geography, and Humanities. The primary content emphasis for this course pertains to the study of the chronological development of the Vietnam War by examining the political, economic, social, religious, military and cultural events that affected the war. Students will be exposed to the historical, geographic, political, economic, and sociological events which influenced the progression of the war including, but not limited to, an analysis of the United States military effort and makeup in the war, an evaluation of the role of the United States homefront, interpretations of the effects of the media, film and literature during and after the war, a judgment of crucial decisions made during the Vietnam War and an analysis of the resulting impact |

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| | of the conflict.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (69)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| HE.912.C.2.4: | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| LACC.910.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| LACC.910.RH.1.2: | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
| LACC.910.RH.1.3: | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |
| LACC.910.RH.2.4: | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| LACC.910.RH.2.5: | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| LACC.910.RH.2.6: | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| LACC.910.RH.3.7: | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| LACC.910.RH.3.8: | Assess the extent to which the reasoning and evidence in a text support the author’s claims. |
| LACC.910.RH.3.9: | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| LACC.910.RH.4.10: | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |

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| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. |

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| | b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., |

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| | articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.1.1:** | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| **SS.912.A.1.2:** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |
| **SS.912.A.1.3:** | Utilize timelines to identify the time sequence of historical data. |
| **SS.912.A.1.4:** | Analyze how images, symbols, objects, cartoons, graphs, charts, |

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| | maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| **SS.912.A.1.5:** | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| **SS.912.A.1.6:** | Use case studies to explore social, political, legal, and economic relationships in history. |
| **SS.912.A.1.7:** | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| **SS.912.A.2.5:** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| **SS.912.A.6.11:** | Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world. |
| **SS.912.A.6.13:** | Analyze significant foreign policy events during the Truman, Eisenhower, Kennedy, Johnson, and Nixon administrations.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Domino Theory, Sputnik, space race, Korean Conflict, Vietnam Conflict, U-2 and Gary Powers, Bay of Pigs invasion, Cuban Missile Crisis, Berlin Wall, Ping Pong Diplomacy, opening of China. |
| **SS.912.A.6.14:** | Analyze causes, course, and consequences of the Vietnam War.<br>Remarks/Examples<br>Examples may include, but are not lmited to, Geneva Accords, Gulf of Tonkin Resolution, the draft, escalating protest at home, Vietnamization, the War Powers Act. |
| **SS.912.A.6.15:** | Examine key events and peoples in Florida history as they relate to United States history. |

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| | Remarks/Examples<br>Examples may include, but are not limited to, Mosquito Fleet, "Double V Campaign", construction of military bases and WWII training centers, 1959 Cuban coup and its impact on Florida, development of the space program and NASA. |
| **SS.912.A.7.1:** | Identify causes for Post-World War II prosperity and its effects on American society.<br>Remarks/Examples<br>Examples may include, but are not limited to, G.I. Bill, Baby Boom, growth of suburbs, Beatnik movement, youth culture, religious revivalism (e.g., Billy Graham and Bishop Fulton J. Sheen), conformity of the 1950s and the protest in the 1960s. |
| **SS.912.A.7.10:** | Analyze the significance of Vietnam and Watergate on the government and people of the United States.<br>Remarks/Examples<br>Examples may include, but are not limited to, mistrust of government, reinforcement of freedom of the press, as well as checks and balances, *New York Times v. Nixon.* |
| **SS.912.A.7.11:** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12:** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Remarks/Examples<br>Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.14:** | Review the role of the United States as a participant in the global economy (trade agreements, international competition, impact on |

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| | American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| **SS.912.A.7.16:** | Examine changes in immigration policy and attitudes toward immigration since 1950. |
| **SS.912.A.7.17:** | Examine key events and key people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.A.7.2:** | Compare the relative prosperity between different ethnic groups and social classes in the post-World War II period. |
| **SS.912.A.7.3:** | Examine the changing status of women in the United States from post-World War II to present.<br>Remarks/Examples<br>Examples may include, but are not limited to, increased numbers of women in the workforce, Civil Rights Act of 1964, *The Feminine Mystique*, National Organization for Women, *Roe v. Wade,* Equal Rights Amendment, Title IX, Betty Freidan, Gloria Steinem, Phyllis Schlafly, Billie Jean King, feminism. |
| **SS.912.A.7.4:** | Evaluate the success of 1960s era presidents' foreign and domestic policies.<br>Remarks/Examples<br>Examples may include, but are not limited to, civil rights legislation, Space Race, Great Society, War on Poverty. |
| **SS.912.A.7.9:** | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s. |
| **SS.912.C.2.4:** | Evaluate, take, and defend positions on issues that cause the |

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| | government to balance the interests of individuals with the public good. |
| SS.912.C.4.1: | Explain how the world's nations are governed differently. |
| SS.912.C.4.2: | Evaluate the influence of American foreign policy on other nations and the influences of other nations on American policies and society. |
| SS.912.C.4.3: | Assess human rights policies of the United States and other countries. |
| SS.912.C.4.4: | Compare indicators of democratization in multiple countries. |
| SS.912.G.1.2: | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| SS.912.G.1.3: | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| SS.912.G.1.4: | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| SS.912.G.2.1: | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| SS.912.G.4.2: | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| SS.912.G.4.3: | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| SS.912.G.4.9: | Use political maps to describe the change in boundaries and governments within continents over time. |
| SS.912.G.5.3: | Analyze case studies of the effects of human use of technology on |

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| | the environment of places. |
| SS.912.G.6.1: | Use appropriate maps and other graphic representations to analyze geographic problems and changes over time. |
| SS.912.H.1.1: | Relate works in the arts (architecture, dance, music, theatre, and visual arts) of varying styles and genre according to the periods in which they were created.<br>Remarks/Examples<br>Examples are Bronze Age, Ming Dynasty, Classical, Renaissance, Modern, and Contemporary. |
| SS.912.H.1.3: | Relate works in the arts to various cultures.<br>Remarks/Examples<br>Examples are African, Asian, Oceanic, European, the Americas, Middle Eastern, Egyptian, Greek, Roman. |
| SS.912.H.1.5: | Examine artistic response to social issues and new ideas in various cultures.<br>Remarks/Examples<br>Examples are Victor Hugo's Les Miserables, Langston Hughes' poetry, Pete Seeger's Bring 'Em Home. |
| SS.912.H.3.1: | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| SS.912.W.1.1: | Use timelines to establish cause and effect relationships of historical events. |
| SS.912.W.1.4: | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| SS.912.W.1.5: | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| SS.912.W.6.3: | Compare the philosophies of capitalism, socialism, and communism as described by Adam Smith, Robert Owen, and Karl Marx. |

# Course: Visions and Countervisions: Europe, the U.S. and the World from 1848- 2100390

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4476.aspx

## BASIC INFORMATION

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| **Course Title:** | Visions and Countervisions: Europe, the U.S. and the World from 1848 |
| **Course Number:** | 2100390 |
| **Course Abbreviated Title:** | VISIONS & COUNTERVIS |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **Visions and Countervisions:** Europe,the U.S. and the World from 1848 - The grade 9-12 Visions and Countervisions course consists of the following content area strands: World History, American History, Geography, and Humanities. The primary content emphasis for this course pertains to the chronological study of major concepts and trends evidenced in the United States, Europe, and the world from 1848 to the present. Content should include, but is not limited to, the visions of revolution, nationalism, and imperialism evidenced in European history from 1848 to 1918, international politics from 1918 to 1945 emphasizing post-war Europe, cultural identities following nationalist and independent movements, the development and rise of communism, domestic issues affecting the United States from 1880 to the present, and the United States economic, political, and |

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| | social policies and their effects on the world from 1898 to the present.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br><br>2. Making close reading and rereading of texts central to lessons.<br><br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br><br>4. Requiring students to support answers with evidence from the text.<br><br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (128)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

## HE.912.C.2 Internal and External Influence - Analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.

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| **HE.912.C.2.4 :** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 04/13<br>Belongs to: Internal and External Influence - Analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |

## LACC.1112.RH.1 Key Ideas and Details

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| **LACC.1112.RH.1.1 :** | Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Key Ideas and Details |
| **LACC.1112.RH.1.2 :** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Key Ideas and Details |
| **LACC.1112.RH.1.3 :** | Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Key Ideas and Details |

## LACC.1112.RH.2 Craft and Structure

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| **LACC.1112.RH.2.4 :** | Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Craft and Structure |
| **LACC.1112.RH.2.5 :** | Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Craft and Structure |
| **LACC.1112.RH.2.6 :** | Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Craft and Structure |

## LACC.1112.RH.3 Integration of Knowledge and Ideas

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| **LACC.1112.RH.3.7 :** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Integration of Knowledge and Ideas |
| **LACC.1112.RH.3.8 :** | Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Integration of Knowledge and Ideas |
| **LACC.1112.RH.3.9 :** | Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Integration of Knowledge and Ideas |

## LACC.1112.RH.4 Range of Reading and Level of Text Complexity

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| **LACC.1112.RH.4.10 :** | By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts I Date Adopted or Revised: 12/10<br>Belongs to: Range of Reading and Level of Text Complexity |

## LACC.1112.SL.1 Comprehension and Collaboration

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| **LACC.1112.SL.1.1 :** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Comprehension and Collaboration |
| **LACC.1112.SL.1.2 :** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the |

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| | credibility and accuracy of each source and noting any discrepancies among the data.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Comprehension and Collaboration |
| LACC.1112.SL.1.3 : | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Comprehension and Collaboration |

## LACC.1112.SL.2 Presentation of Knowledge and Ideas

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| LACC.1112.SL.2.4 : | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Presentation of Knowledge and Ideas |

## LACC.1112.WHST.1 Text Types and Purposes

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| LACC.1112.WHST.1.1 : | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and |

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| | counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented.<br><br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Text Types and Purposes |
| **LACC.1112.WHST.1.2 :** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).<br><br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning l Date Adopted or Revised: 12/10 |

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| | Belongs to: Text Types and Purposes |

## SS.912.A.5 Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.

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| **SS.912.A.5.11 :** | Examine causes, course, and consequences of the Great Depression and the New Deal.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.1 :** | Discuss the economic outcomes of demobilization.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.10 :** | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.12 :** | Examine key events and people in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| **SS.912.A.5.2 :** | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| **SS.912.A.5.3 :** | Examine the impact of United States foreign economic policy |

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| | during the 1920s.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |
| **SS.912.A.5.4 :** | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.5 :** | Describe efforts by the United States and other world powers to avoid future wars.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| **SS.912.A.5.6 :** | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.7 :** | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |
| **SS.912.A.5.8 :** | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression. |

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| SS.912.A.5.9 : | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the effects of the changing social, political, and economic conditions of the Roaring Twenties and the Great Depression.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |

## LACC.1112.WHST.2 Production and Distribution of Writing

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| LACC.1112.WHST.2.4 : | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Production and Distribution of Writing |
| LACC.1112.WHST.2.5 : | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Production and Distribution of Writing |
| LACC.1112.WHST.2.6 : | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.<br>Cognitive Complexity: Level 2: Basic Application of Skills & Concepts l Date Adopted or Revised: 12/10<br>Belongs to: Production and Distribution of Writing |

## LACC.1112.WHST.3 Research to Build and Present Knowledge

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| LACC.1112.WHST.3.7 : | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.<br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning l Date Adopted or Revised: 12/10<br>Belongs to: Research to Build and Present Knowledge |

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| LACC.1112.WHST.3.8 : | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.<br>Cognitive Complexity: Level 4: Extended Thinking &Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Research to Build and Present Knowledge |
| LACC.1112.WHST.3.9 : | Draw evidence from informational texts to support analysis, reflection, and research.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Research to Build and Present Knowledge |

## LACC.1112.WHST.4 Range of Writing

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| LACC.1112.WHST.4.10 : | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>Cognitive Complexity: Level 3: Strategic Thinking & Complex Reasoning I Date Adopted or Revised: 12/10<br>Belongs to: Range of Writing |

## SS.912.A.1 Use research and inquiry skills to analyze American history using primary and secondary sources.

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| SS.912.A.1.1 : | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| SS.912.A.1.2 : | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| SS.912.A.1.3 : | Utilize timelines to identify the time sequence of historical data.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08 |

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| | Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| **SS.912.A.1.4 :** | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| **SS.912.A.1.5 :** | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| **SS.912.A.1.6 :** | Use case studies to explore social, political, legal, and economic relationships in history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |
| **SS.912.A.1.7 :** | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Use research and inquiry skills to analyze American history using primary and secondary sources. |

## SS.912.A.2 Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.

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| **SS.912.A.2.1 :** | Review causes and consequences of the Civil War.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| **SS.912.A.2.2 :** | Assess the influence of significant people or groups on Reconstruction.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| **SS.912.A.2.3 :** | Describe the issues that divided Republicans during the early Reconstruction era.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| **SS.912.A.2.4 :** | Distinguish the freedoms guaranteed to African Americans and other groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| **SS.912.A.2.5 :** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08 |

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| | Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people. |
| **SS.912.A.2.6 :** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people. |
| **SS.912.A.2.7 :** | Review the Native American experience.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes, course, and consequences of the Civil War and Reconstruction and its effects on the American people.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |

## SS.912.A.3 Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.

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| **SS.912.A.3.1 :** | Analyze the economic challenges to American farmers and farmers' responses to these challenges in the mid to late 1800s.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, creation of agricultural colleges, Morrill Land Grant Act, gold standard and Bimetallism, the creation of the Populist Party. |
| **SS.912.A.3.10 :** | Review different economic and philosophic ideologies.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |

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| **SS.912.A.3.11 :** | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |
| **SS.912.A.3.12 :** | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, Women's Christian Temperance Union, National Women's Suffrage Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |
| **SS.912.A.3.13 :** | Examine key events and peoples in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.2 :** | Examine the social, political, and economic causes, course, and consequences of the second Industrial Revolution that began in the late 19th century. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution. |
| **SS.912.A.3.3 :** | Compare the first and second Industrial Revolutions in the United States.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, trade, development of new industries. |
| **SS.912.A.3.4 :** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.5 :** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6 :** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08 |

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| | Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, angel Island, push-pull factors. |
| **SS.912.A.3.7 :** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8 :** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution. |
| **SS.912.A.3.9 :** | Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Analyze the transformation of the American economy and the changing social and political conditions in response to the Industrial Revolution.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |

## SS.912.A.4 Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.

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| **SS.912.A.4.1 :** | Analyze the major factors that drove United States imperialism. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Monroe Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |
| **SS.912.A.4.10 :** | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |
| **SS.912.A.4.11 :** | Examine key events and peoples in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.2 :** | Explain the motives of the United States acquisition of the territories.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| **SS.912.A.4.3 :** | Examine causes, course, and consequences of the Spanish |

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| | American War.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| **SS.912.A.4.4 :** | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| **SS.912.A.4.5 :** | Examine causes, course, and consequences of United States involvement in World War I.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |
| **SS.912.A.4.6 :** | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public Information).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United |

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| | States in world affairs through the end of World War I. |
| **SS.912.A.4.7 :** | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys).<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I. |
| **SS.912.A.4.8 :** | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I. |
| **SS.912.A.4.9 :** | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Demonstrate an understanding of the changing role of the United States in world affairs through the end of World War I. |

## SS.912.A.6 Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.

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| **SS.912.A.6.1 :** | Examine causes, course, and consequences of World War II on the United States and the world.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, riseof dictators, attack on Pearl Harbor, Nazi party, American neutrality, D-Day, Battle of the Bulge, War in the Pacific, internment camps, Holocaust, Yalta. |
| **SS.912.A.6.10 :** | Examine causes, course, and consequences of the early years of the Cold War (Truman Doctrine, Marshall Plan, NATO, Warsaw Pact).<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of |

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| | the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.11 :** | Examine the controversy surrounding the proliferation of nuclear technology in the United States and the world.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.12 :** | Examine causes, course, and consequences of the Korean War.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Communist China, 38th parallel, cease fire, firing of Gen. Douglas McArthur. |
| **SS.912.A.6.13 :** | Analyze significant foreign policy events during the Truman, Eisenhower, Kennedy, Johnson, and Nixon administrations.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Domino Theory, Sputnik, space race, Korean Conflict, Vietnam Conflict, U-2 and Gary Powers, Bay of Pigs invasion, Cuban Missile Crisis, Berlin Wall, Ping Pong Diplomacy, opening of China. |
| **SS.912.A.6.14 :** | Analyze causes, course, and consequences of the Vietnam War.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not lmited to, Geneva Accords, Gulf of Tonkin Resolution, the draft, escalating protest at home, Vietnamization, the War Powers Act. |
| **SS.912.A.6.15 :** | Examine key events and peoples in Florida history as they relate to United States history. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, Mosquito Fleet, "Double V Campaign", construction of military bases and WWII training centers, 1959 Cuban coup and its impact on Florida, development of the space program and NASA. |
| **SS.912.A.6.2 :** | Describe the United States response in the early years of World War II (Neutrality Acts, Cash and Carry, Lend Lease Act).<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.3 :** | Analyze the impact of the Holocaust during World War II on Jews as well as other groups.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.4 :** | Examine efforts to expand or contract rights for various populations during World War II.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, women, African Americans, German Americans, Japanese Americans and their internment, Native Americans, Hispanic Americans, Italian Americans. |
| **SS.912.A.6.5 :** | Explain the impact of World War II on domestic government policy.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, rationing, national security, civil rights, increased job opportunities for African |

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| | Americans, women, Jews, and other refugees. |
| **SS.912.A.6.6 :** | Analyze the use of atomic weapons during World War II and the aftermath of the bombings.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.7 :** | Describe the attempts to promote international justice through the Nuremberg Trials.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world. |
| **SS.912.A.6.8 :** | Analyze the effects of the Red Scare on domestic United States policy.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, loyalty review program, House Un-American Activities Committee, McCarthyism (Sen. Joe McCarthy), McCarran Act. |
| **SS.912.A.6.9 :** | Describe the rationale for the formation of the United Nations, including the contribution of Mary McLeod Bethune.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the causes and course of World War II, the character of the war at home and abroad, and its reshaping of the United States role in the post-war world.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Declaration of Human Rights. |

**SS.912.A.7 Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.**

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| **SS.912.A.7.1 :** | Identify causes for Post-World War II prosperity and its effects on |

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| | American society.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, G.I. Bill, Baby Boom, growth of suburbs, Beatnik movement, youth culture, religious revivalism (e.g., Billy Graham and Bishop Fulton J. Sheen), conformity of the 1950s and the protest in the 1960s. |
| **SS.912.A.7.10 :** | Analyze the significance of Vietnam and Watergate on the government and people of the United States.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, mistrust of government, reinforcement of freedom of the press, as well as checks and balances, *New York Times v. Nixon.* |
| **SS.912.A.7.11 :** | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| **SS.912.A.7.12 :** | Analyze political, economic, and social concerns that emerged at the end of the 20th century and into the 21st century.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, AIDS, Green Revolution, outsourcing of jobs, global warming, human rights violations. |
| **SS.912.A.7.13 :** | Analyze the attempts to extend New Deal legislation through the Great Society and the successes and failures of these programs to promote social and economic stability.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Civil Rights Act of 1964, Voting Rights Act of 1965, War on Poverty, Medicare, Medicaid, Headstart. |
| **SS.912.A.7.14 :** | Review the role of the United States as a participant  in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| **SS.912.A.7.15 :** | Analyze the effects of foreign and domestic terrorism on the American people.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Oklahoma City bombing, attack of September 11, 2001, Patriot Act, wars in Afghanistan and Iraq. |
| **SS.912.A.7.16 :** | Examine changes in immigration policy and attitudes toward immigration since 1950. |

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| | Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life. |
| **SS.912.A.7.17 :** | Examine key events and key people in Florida history as they relate to United States history.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, selection of Central Florida as a location for Disney, growth of the citrus and cigar industries, construction of Interstates, Harry T. Moore, Pork Chop Gang, Claude Pepper, changes in the space program, use of DEET, Hurricane Andrew, the Election of 2000, migration and immigration, Sunbelt state. |
| **SS.912.A.7.2 :** | Compare the relative prosperity between different ethnic groups and social classes in the post-World War II period.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life. |
| **SS.912.A.7.3 :** | Examine the changing status of women in the United States from post-World War II to present.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, increased numbers of women in the workforce, Civil Rights Act of 1964, *The Feminine Mystique*, National Organization for Women, *Roe v. Wade,* Equal Rights Amendment, Title IX, Betty Freidan, Gloria Steinem, Phyllis Schlafly, Billie Jean King, feminism. |
| **SS.912.A.7.4 :** | Evaluate the success of 1960s era presidents' foreign and domestic policies.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and |

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| | political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, civil rights legislation, Space Race, Great Society, War on Poverty. |
| **SS.912.A.7.5 :** | Compare nonviolent and violent approaches utilized by groups (African Americans, women, Native Americans, Hispanics) to achieve civil rights.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, sit-ins, Freedom Rides, boycotts, riots, protest marches. |
| **SS.912.A.7.6 :** | Assess key figures and organizations in shaping the Civil Rights Movement and Black Power Movement.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, the NAACP, National Urban League, SNCC, CORE, James Farmer, Charles Houston, Thurgood Marshall, Rosa Parks, Constance Baker Motley, the Little Rock Nine, Roy Wilkins, Whitney M. Young, A. Philip Randolph, Dr. Martin Luther King, Jr., Robert F. Williams, Fannie Lou Hamer, Malcolm X [El-Hajj Malik El-Shabazz], Stokely Carmichael [Kwame Ture], H. Rap Brown [Jamil Abdullah Al-Amin], the Black Panther Party [e.g., Huey P. Newton, Bobby Seale]. |
| **SS.912.A.7.7 :** | Assess the building of coalitions between African Americans, whites, and other groups in achieving integration and equal rights.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Freedom Summer, |

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| | Freedom Rides, Montgomery Bus Boycott, Tallahassee Bus Boycott of 1956, March on Washington. |
| **SS.912.A.7.8 :** | Analyze significant Supreme Court decisions relating to integration, busing, affirmative action, the rights of the accused, and reproductive rights.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, Plessy v. Ferguson [1896], Brown v. Board of Education [1954], Swann v. Charlotte-Mecklenburg Board of Education [1971], Regents of the University of California v. Bakke [1978], Miranda v. Arizona [1966], Gideon v. Wainright [1963], Mapp v. Ohio [1961], and Roe v. Wade [1973]. |
| **SS.912.A.7.9 :** | Examine the similarities of social movements (Native Americans, Hispanics, women, anti-war protesters) of the 1960s and 1970s.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the rise and continuing international influence of the United States as a world leader and the impact of contemporary social and political movements on American life. |

## SS.912.G.1 Understand how to use maps and other geographic representations, tools, and technology to report information.

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| **SS.912.G.1.1 :** | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how to use maps and other geographic representations, tools, and technology to report information. |
| **SS.912.G.1.2 :** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how to use maps and other geographic representations, tools, and technology to report information. |
| **SS.912.G.1.3 :** | Employ applicable units of measurement and scale to solve simple |

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| | locational problems using maps and globes.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how to use maps and other geographic representations, tools, and technology to report information. |
| **SS.912.G.1.4 :** | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how to use maps and other geographic representations, tools, and technology to report information.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |

## SS.912.G.2 Understand physical and cultural characteristics of places.

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| **SS.912.G.2.1 :** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand physical and cultural characteristics of places.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources.<br>Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.2.2 :** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand physical and cultural characteristics of places. |
| **SS.912.G.2.3 :** | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand physical and cultural characteristics of places.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural |

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| | disasters. |

## SS.912.G.4 Understand the characteristics, distribution, and migration of human populations.

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| SS.912.G.4.1 : | Interpret population growth and other demographic data for any given place.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |
| SS.912.G.4.2 : | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |
| SS.912.G.4.3 : | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |
| SS.912.G.4.7 : | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |
| SS.912.G.4.9 : | Use political maps to describe the change in boundaries and governments within continents over time.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand the characteristics, distribution, and migration of human populations. |

## SS.912.H.1 Identify and analyze the historical, social, and cultural contexts of the arts.

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| SS.912.H.1.4 : | Explain philosophical beliefs as they relate to works in the arts.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Identify and analyze the historical, social, and cultural contexts of the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |

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## SS.912.H.3 Understand how transportation, trade, communication, science, and technology influence the progression and regression of cultures.

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| SS.912.H.3.1 : | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how transportation, trade, communication, science, and technology influence the progression and regression of cultures. |
| SS.912.H.3.2 : | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Understand how transportation, trade, communication, science, and technology influence the progression and regression of cultures. |

## SS.912.W.1 Utilize historical inquiry skills and analytical processes.

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| SS.912.W.1.1 : | Use timelines to establish cause and effect relationships of historical events.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Utilize historical inquiry skills and analytical processes. |
| SS.912.W.1.2 : | Compare time measurement systems used by different cultures.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Utilize historical inquiry skills and analytical processes.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| SS.912.W.1.3 : | Interpret and evaluate primary and secondary sources.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Utilize historical inquiry skills and analytical processes.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| SS.912.W.1.4 : | Explain how historians use historical inquiry and other sciences to understand the past.<br>Cognitive Complexity: N/A l Date Adopted or Revised: 12/08<br>Belongs to: Utilize historical inquiry skills and analytical processes. |

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| | Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| **SS.912.W.1.5 :** | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography).<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Utilize historical inquiry skills and analytical processes. |
| **SS.912.W.1.6 :** | Evaluate the role of history in shaping identity and character.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Utilize historical inquiry skills and analytical processes.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |

## SS.912.W.4 Analyze the causes, events, and effects of the Renaissance, Reformation, Scientific Revolution, and Age of Exploration.

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| **SS.912.W.4.11 :** | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors.<br>Cognitive Complexity: N/A I Date Adopted or Revised: 12/08<br>Belongs to: Analyze the causes, events, and effects of the Renaissance, Reformation, Scientific Revolution, and Age of Exploration. |

# Course: Visions and Their Pursuits:An American Tradition-U.S.History to 1920-2100380

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4468.aspx

## BASIC INFORMATION

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| **Course Title:** | Visions and Their Pursuits:An American Tradition-U.S.History to 1920 |
| **Course Number:** | 2100380 |
| **Course Abbreviated Title:** | VISIONS & PURSUITS |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **Visions and Their Pursuits: An American Tradition-U.S.History to 1920** - The grade 9-12 Visions and Their Pursuits course consists of the following content area strands: World History, American History, Civics and Government, Geography, and Humanities. The primary content emphasis for this course pertains to the chronological study of the United States during the period of European exploration through World War I and the collective vision of historical time periods. Content will include, but is not limited to, the foundation and early development of the United States as organized by the visions of those who participated in the revolutions leading to the establishment and early success of the United States, the political, social, cultural, intellectual, and technological revolutions of the |

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| | United States, the structure and function of political divisions, the organization of the federal government as outlined in the U.S. Constitution, the impact of economic, social, and political changes on traditional American values, reactions to changes, and growth of sectionalism, the failure of previous visions, and the emergence of an industrial, urban and pluralistic society that demands new visions to carry the nation forward.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (100)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.

- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| HE.912.C.2.4: | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| LACC.910.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| LACC.910.RH.1.2: | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
| LACC.910.RH.1.3: | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |
| LACC.910.RH.2.4: | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| LACC.910.RH.2.5: | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| LACC.910.RH.2.6: | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| LACC.910.RH.3.7: | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| LACC.910.RH.3.8: | Assess the extent to which the reasoning and evidence in a text support the author's claims. |

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| **LACC.910.RH.3.9:** | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| **LACC.910.RH.4.10:** | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |

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| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. |

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| | e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **SS.912.A.5.1:** | Discuss the economic outcomes of demobilization. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.1.4:** | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |

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| SS.912.A.1.5: | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| SS.912.A.1.6: | Use case studies to explore social, political, legal, and economic relationships in history. |
| SS.912.A.1.7: | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| SS.912.A.2.1: | Review causes and consequences of the Civil War.<br>Remarks/Examples<br>Examples may include, but are not limited to, slavery, states' rights, territorial claims, abolitionist movement, regional differences, Reconstruction, 13th, 14th, and 15th amendments. |
| SS.912.A.2.2: | Assess the influence of significant people or groups on Reconstruction.<br>Remarks/Examples<br>Examples may include, but are not limited to, Andrew Johnson, Radical Republicans, Jefferson Davis, Frederick Douglass, Ulysses S. Grant, Robert E. Lee, William T. Sherman, Buffalo Soldiers, Harriet Tubman, and Sojourner Truth. |
| SS.912.A.2.3: | Describe the issues that divided Republicans during the early Reconstruction era.<br>Remarks/Examples<br>Examples may include, but are not limited to, the impeachment of Andrew Johnson, southern whites, blacks, black legislators and white extremist organizations such as the KKK, Knights of the White Camellia, The White League, Red Shirts, and Pale Faces. |
| SS.912.A.2.4: | Distinguish the freedoms guaranteed to African Americans and other |

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| | groups with the 13th, 14th, and 15th Amendments to the Constitution.<br>Remarks/Examples<br>Examples may include, but are not limited to, abolition of slavery, citizenship, suffrage, equal protection. |
| **SS.912.A.2.5:** | Assess how Jim Crow Laws influenced life for African Americans and other racial/ethnic minority groups. |
| **SS.912.A.2.6:** | Compare the effects of the Black Codes and the Nadir on freed people, and analyze the sharecropping system and debt peonage as practiced in the United States. |
| **SS.912.A.2.7:** | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |
| **SS.912.A.3.10:** | Review different economic and philosophic ideologies.<br>Remarks/Examples<br>Economic examples may include, but are not limited to, market economy, mixed economy, planned economy and philosophic examples are capitalism, socialism, communism, anarchy. |
| **SS.912.A.3.11:** | Analyze the impact of political machines in United States cities in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Boss Tweed, Tammany Hall, George Washington Plunkitt, Washington Gladden, Thomas Nast. |
| **SS.912.A.3.12:** | Compare how different nongovernmental organizations and progressives worked to shape public policy, restore economic opportunities, and correct injustices in American life.<br>Remarks/Examples<br>Examples may include, but are not limited to, NAACP, YMCA, Women's Christian Temperance Union, National Women's Suffrage |

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| | Association, National Women's Party, Robert LaFollette, Florence Kelley, Ida M. Tarbell, Eugene Debs, Carrie Chapman Catt, Alice Paul, Theodore Roosevelt, William Taft, Woodrow Wilson, Upton Sinclair, Booker T. Washington, W.E.B. DuBois, Gifford Pinchot, William Jennings Bryan. |
| **SS.912.A.3.13:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, the railroad industry, bridge construction in the Florida Keys, the cattle industry, the cigar industry, the influence of Cuban, Greek and Italian immigrants, Henry B. Plant, William Chipley, Henry Flagler, George Proctor, Thomas DeSaille Tucker, Hamilton Disston. |
| **SS.912.A.3.4:** | Determine how the development of steel, oil, transportation, communication, and business practices affected the United States economy.<br>Remarks/Examples<br>Examples may include, but are not limited to, railroads, the telegraph, pools, holding companies, trusts, corporations, contributed to westward expansion, expansion of trade and development of new industries, vertical and horizontal integration. |
| **SS.912.A.3.5:** | Identify significant inventors of the Industrial Revolution including African Americans and women.<br>Remarks/Examples<br>Examples may include, but are not limited to, Lewis Howard Latimer, Jan E. Matzeliger, Sarah E. Goode, Granville T. Woods, Alexander Graham Bell, Thomas Edison, George Pullman, Henry Ford, Orville and Wilbur Wright, Elijah McCoy, Garrett Morgan, Madame C.J. Walker, George Westinghouse. |
| **SS.912.A.3.6:** | Analyze changes that occurred as the United States shifted from agrarian to an industrial society.<br>Remarks/Examples<br>Examples may include, but are not limited to, Social Darwinism, laissez-faire, government regulations of food and drugs, migration to cities, urbanization, changes to the family structure, Ellis Island, |

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| | angel Island, push-pull factors. |
| **SS.912.A.3.7:** | Compare the experience of European immigrants in the east to that of Asian immigrants in the west (the Chinese Exclusion Act, Gentlemen's Agreement with Japan).<br>Remarks/Examples<br>Examples may include, but are not limited to nativism, integration of immigrants into society when comparing "Old" [before 1890] and "New" immigrants [after 1890], Immigration Act of 1924. |
| **SS.912.A.3.8:** | Examine the importance of social change and reform in the late 19th and early 20th centuries (class system, migration from farms to cities, Social Gospel movement, role of settlement houses and churches in providing services to the poor). |
| **SS.912.A.3.9:** | Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries.<br>Remarks/Examples<br>Examples may include, but are not limited to, unions, Knights of Labor, american Federation of Labor, socialist Party, labor laws. |
| **SS.912.A.4.1:** | Analyze the major factors that drove United States imperialism.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Monroe Doctrine, Manifest Destiny, *The Influence of Sea Power Upon History,* Turner's thesis,the Roosevelt Corollary, natural resources, markets for resources, elimination of spheres of influence in China. |
| **SS.912.A.4.10:** | Examine the provisions of the Treaty of Versailles and the failure of the United States to support the League of Nations.<br>Remarks/Examples<br>Examples may include, but are not limited to, self-determination, boundaries, demilitarized zone, sanctions reparations, and the League of Nations (including Article X of the Covenant). |
| **SS.912.A.4.11:** | Examine key events and peoples in Florida history as they relate to United States history.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, the Spanish-American War, Ybor City, Jose Marti. |
| **SS.912.A.4.2:** | Explain the motives of the United States acquisition of the territories.<br>Remarks/Examples<br>Examples may include, but are not limited to, Alaska, Hawaii, Puerto Rico, Philippines, Guam, Samoa, Marshall Islands, Midway Island, Virgin Islands. |
| **SS.912.A.4.3:** | Examine causes, course, and consequences of the Spanish American War.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| **SS.912.A.4.4:** | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Remarks/Examples<br>Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| **SS.912.A.4.5:** | Examine causes, course, and consequences of United States involvement in World War I.<br>Remarks/Examples<br>Examples may include, but are not limited to, nationalism, imperialism, militarism, entangling alliances vs. neutrality, Zimmerman Note, the *Lusitania,* the Selective Service Act, the homefront, the American Expeditionary Force, Wilson's Fourteen Points, the Treaty of Versailles (and opposition to it), isolationism. |
| **SS.912.A.4.6:** | Examine how the United States government prepared the nation for war with war measures (Selective Service Act, War Industries Board, war bonds, Espionage Act, Sedition Act, Committee of Public |

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| | Information). |
| SS.912.A.4.7: | Examine the impact of airplanes, battleships, new weaponry and chemical warfare in creating new war strategies (trench warfare, convoys). |
| SS.912.A.4.8: | Compare the experiences Americans (African Americans, Hispanics, Asians, women, conscientious objectors) had while serving in Europe. |
| SS.912.A.4.9: | Compare how the war impacted German Americans, Asian Americans, African Americans, Hispanic Americans, Jewish Americans, Native Americans, women and dissenters in the United States. |
| SS.912.A.5.10: | Analyze support for and resistance to civil rights for women, African Americans, Native Americans, and other minorities. |
| SS.912.A.5.11: | Examine causes, course, and consequences of the Great Depression and the New Deal. |
| SS.912.A.5.12: | Examine key events and people in Florida history as they relate to United States history.<br>Remarks/Examples<br>Examples may include, but are not limited to, Rosewood, land boom, speculation, impact of climate and natural disasters on the end of the land boom, invention of modern air conditioning in 1929, Alfred DuPont, Majorie Kinnan Rawlings, Zora Neale Hurston, James Weldon Johnson. |
| SS.912.A.5.2: | Explain the causes of the public reaction (Sacco and Vanzetti, labor, racial unrest) associated with the Red Scare.<br>Remarks/Examples<br>Examples may also include, but are not limited to, Palmer Raids, FBI, J. Edgar Hoover. |
| SS.912.A.5.3: | Examine the impact of United States foreign economic policy during the 1920s.<br>Remarks/Examples<br>Examples may include, but are not limited to, the Depression of 1920-21, "The Business of America is Business," assembly line, installment buying, consumerism. |

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| SS.912.A.5.4: | Evaluate how the economic boom during the Roaring Twenties changed consumers, businesses, manufacturing, and marketing practices. |
| SS.912.A.5.5: | Describe efforts by the United States and other world powers to avoid future wars.<br>Remarks/Examples<br>Examples may include, but are not limited to, League of Nations, Washington Naval Conference, London Conference, Kellogg-Briand Pact, the Nobel Prize. |
| SS.912.A.5.6: | Analyze the influence that Hollywood, the Harlem Renaissance, the Fundamentalist movement, and prohibition had in changing American society in the 1920s. |
| SS.912.A.5.7: | Examine the freedom movements that advocated civil rights for African Americans, Latinos, Asians, and women. |
| SS.912.A.5.8: | Compare the views of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey relating to the African American experience. |
| SS.912.A.5.9: | Explain why support for the Ku Klux Klan varied in the 1920s with respect to issues such as anti-immigration, anti-African American, anti-Catholic, anti-Jewish, anti-women, and anti-union ideas.<br>Remarks/Examples<br>Examples may include, but are not limited to, 100 Percent Americanism. |
| SS.912.C.1.1: | Evaluate, take, and defend positions on the founding ideals and principles in American Constitutional government. |
| SS.912.C.1.2: | Explain how the Declaration of Independence reflected the political principles of popular sovereignty, social contract, natural rights, and individual rights. |
| SS.912.C.1.3: | Evaluate the ideals and principles of the founding documents (Declaration of Independence, Articles of Confederation, Federalist Papers) that shaped American Democracy. |
| SS.912.C.1.4: | Analyze and categorize the diverse viewpoints presented by the Federalists and the Anti-Federalists concerning ratification of the Constitution and inclusion of a bill of rights. |
| SS.912.C.1.5: | Evaluate how the Constitution and its amendments reflect the |

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| | political principles of rule of law, checks and balances, separation of powers, republicanism, democracy, and federalism. |
| **SS.912.C.3.2:** | Define federalism, and identify examples of the powers granted and denied to states and the national government in the American federal system of government. |
| **SS.912.C.3.3:** | Analyze the structures, functions, and processes of the legislative branch as described in Article I of the Constitution. |
| **SS.912.C.3.4:** | Analyze the structures, functions, and processes of the executive branch as described in Article II of the Constitution. |
| **SS.912.C.3.5:** | Identify the impact of independent regulatory agencies in the federal bureaucracy.<br>Remarks/Examples<br>Examples are Federal Reserve, Food and Drug Administration, Federal Communications Commission. |
| **SS.912.C.3.6:** | Analyze the structures, functions, and processes of the judicial branch as described in Article III of the Constitution. |
| **SS.912.G.1.1:** | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| **SS.912.G.1.2:** | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| **SS.912.G.1.3:** | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| **SS.912.G.1.4:** | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| **SS.912.G.2.1:** | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples |

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| | Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| **SS.912.G.2.3:** | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| **SS.912.G.4.1:** | Interpret population growth and other demographic data for any given place. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.G.4.7:** | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |
| **SS.912.G.4.9:** | Use political maps to describe the change in boundaries and governments within continents over time. |
| **SS.912.H.1.4:** | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| **SS.912.H.3.2:** | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture. |
| **SS.912.W.1.1:** | Use timelines to establish cause and effect relationships of historical events. |

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| SS.912.W.1.2: | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| SS.912.W.1.3: | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| SS.912.W.1.4: | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| SS.912.W.1.5: | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| SS.912.W.1.6: | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |
| SS.912.W.4.11: | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors. |

# Course: Eastern and Western Heritage-2100370

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4462.aspx

## BASIC INFORMATION

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| **Course Title:** | Eastern and Western Heritage |
| **Course Number:** | 2100370 |
| **Course Abbreviated Title:** | EAST & WEST HERITAGE |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **Eastern and Western Heritage** - The grade 9-12 Eastern and Western Heritage course consists of the following content area strands: World History, American History, Geography, and Humanities. The primary content emphasis for this course pertains to the study of the world's earliest civilizations to the ancient and classical civilizations of Africa, Asia, and Europe. Content will include, but is not limited to, the birth of civilizations throughout the world, including the origins of societies from Mesopotamia, Africa, China, India, and Mesoamerica from the perspective of cultural geography, growth, dissemination, and decline of four classic civilizations of India, China, Greece, and Rome, the role of isolation and interaction in the development of the Byzantine Empire, African and Mesoamerican civilizations, India, China, Japan, and Europe, and the emergence of social, political, economic, and religious institutions |

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| | and ideas.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence). |

## STANDARDS (103)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| **HE.912.C.2.4:** | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Some examples may include seat belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| **LACC.910.RH.1.1:** | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| **LACC.910.RH.1.2:** | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
| **LACC.910.RH.1.3:** | Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. |
| **LACC.910.RH.2.4:** | Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science. |
| **LACC.910.RH.2.5:** | Analyze how a text uses structure to emphasize key points or advance an explanation or analysis. |
| **LACC.910.RH.2.6:** | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| **LACC.910.RH.3.7:** | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| **LACC.910.RH.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author's claims. |
| **LACC.910.RH.3.9:** | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| **LACC.910.RH.4.10:** | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |

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| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. |

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| | b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., |

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| | articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **SS.912.W.2.21:** | Compare Japanese feudalism with Western European feudalism during the Middle Ages. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.1.1:** | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| **SS.912.A.1.2:** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |

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| SS.912.A.1.3: | Utilize timelines to identify the time sequence of historical data. |
| SS.912.A.1.4: | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| SS.912.A.1.5: | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| SS.912.A.1.6: | Use case studies to explore social, political, legal, and economic relationships in history. |
| SS.912.G.1.1: | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| SS.912.G.1.2: | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| SS.912.G.1.3: | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |
| SS.912.G.1.4: | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| SS.912.G.2.1: | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, |

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| | economy, demography. |
| **SS.912.G.2.2:** | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| **SS.912.G.2.3:** | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| **SS.912.G.4.1:** | Interpret population growth and other demographic data for any given place. |
| **SS.912.G.4.2:** | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| **SS.912.G.4.3:** | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| **SS.912.G.4.7:** | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |
| **SS.912.G.4.9:** | Use political maps to describe the change in boundaries and governments within continents over time. |
| **SS.912.H.1.4:** | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |
| **SS.912.H.3.1:** | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| **SS.912.H.3.2:** | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture. |
| **SS.912.W.1.1:** | Use timelines to establish cause and effect relationships of historical events. |
| **SS.912.W.1.2:** | Compare time measurement systems used by different cultures.<br>Remarks/Examples |

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| | Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| **SS.912.W.1.3:** | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| **SS.912.W.1.4:** | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| **SS.912.W.1.5:** | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| **SS.912.W.1.6:** | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |
| **SS.912.W.2.1:** | Locate the extent of Byzantine territory at the height of the empire. |
| **SS.912.W.2.10:** | Describe the orders of medieval social hierarchy, the changing role of the Church, the emergence of feudalism, and the development of private property as a distinguishing feature of Western Civilization. |
| **SS.912.W.2.11:** | Describe the rise and achievements of significant rulers in medieval Europe.<br>Remarks/Examples<br>Examples are Charles Martel, Charlemagne, Otto the Great, William the Conqueror. |
| **SS.912.W.2.12:** | Recognize the importance of Christian monasteries and convents as centers of education, charitable and missionary activity, economic productivity, and political power. |
| **SS.912.W.2.13:** | Explain how Western civilization arose from a synthesis of classical Greco-Roman civilization, Judeo-Christian influence, and the cultures of northern European peoples promoting a cultural unity in Europe. |

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| **SS.912.W.2.14:** | Describe the causes and effects of the Great Famine of 1315-1316, The Black Death, The Great Schism of 1378, and the Hundred Years War on Western Europe. |
| **SS.912.W.2.15:** | Determine the factors that contributed to the growth of a modern economy.<br>Remarks/Examples<br>Examples are growth of banking, technological and agricultural improvements, commerce, towns, guilds, rise of a merchant class. |
| **SS.912.W.2.16:** | Trace the growth and development of a national identity in the countries of England, France, and Spain. |
| **SS.912.W.2.17:** | Identify key figures, artistic, and intellectual achievements of the medieval period in Western Europe.<br>Remarks/Examples<br>Examples are Anselm of Canterbury, Chaucer, Thomas Aquinas, Roger Bacon, Hildegard of Bingen, Dante, Code of Chivalry, Gothic architecture, illumination, universities, Natural Law Philosophy, Scholasticism. |
| **SS.912.W.2.18:** | Describe developments in medieval English legal and constitutional history and their importance to the rise of modern democratic institutions and procedures.<br>Remarks/Examples<br>Examples are Magna Carta, parliament, habeas corpus. |
| **SS.912.W.2.19:** | Describe the impact of Japan's physiography on its economic and political development. |
| **SS.912.W.2.2:** | Describe the impact of Constantine the Great's establishment of "New Rome" (Constantinople) and his recognition of Christianity as a legal religion. |
| **SS.912.W.2.20:** | Summarize the major cultural, economic, political, and religious developments in medieval Japan.<br>Remarks/Examples<br>Examples arePillow Book, Tale of Genji, Shinto and Japanese Buddhism, the rise of feudalism, the development of the shogunate, samurai, and social hierarchy. |

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| SS.912.W.2.22: | Describe Japan's cultural and economic relationship to China and Korea. |
| SS.912.W.2.3: | Analyze the extent to which the Byzantine Empire was a continuation of the old Roman Empire and in what ways it was a departure. |
| SS.912.W.2.4: | Identify key figures associated with the Byzantine Empire.<br>Remarks/Examples<br>Examples are Justinian the Great, Theodora, Belisarius, John of Damascus, Anna Comnena, Cyril and Methodius. |
| SS.912.W.2.5: | Explain the contributions of the Byzantine Empire.<br>Remarks/Examples<br>Examples are Justinian's Code, the preservation of ancient Greek and Roman learning and culture, artistic and architectural achievements, the empire's impact on the development of Western Europe, Islamic civilization, and Slavic peoples. |
| SS.912.W.2.6: | Describe the causes and effects of the Iconoclast controversy of the 8th and 9th centuries and the 11th century Christian schism between the churches of Constantinople and Rome. |
| SS.912.W.2.7: | Analyze causes (Justinian's Plague, ongoing attacks from the "barbarians," the Crusades, and internal political turmoil) of the decline of the Byzantine Empire. |
| SS.912.W.2.8: | Describe the rise of the Ottoman Turks, the conquest of Constantinople in 1453, and the subsequent growth of the Ottoman empire under the sultanate including Mehmet the Conquerer and Suleyman the Magnificent. |
| SS.912.W.2.9: | Analyze the impact of the collapse of the Western Roman Empire on Europe. |
| SS.912.W.3.1: | Discuss significant people and beliefs associated with Islam.<br>Remarks/Examples<br>Examples are the prophet Muhammad, the early caliphs, the Pillars of Islam, Islamic law, the relationship between government and religion in Islam. |
| SS.912.W.3.10: | Identify key significant economic, political, and social characteristics of Ghana. |

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| | Remarks/Examples<br>Examples are salt and gold trade, taxation system, gold monopoly, matrilineal inheritance, griots, ancestral worship, rise of Islam, slavery. |
| **SS.912.W.3.11:** | Identify key figures and significant economic, political, and social characteristics associated with Mali.<br>Remarks/Examples<br>Examples are Sundiata, Epic of Sundiata, Mansa Musa, Ibn Battuta, gold mining and salt trade, slavery. |
| **SS.912.W.3.12:** | Identify key figures and significant economic, political, and social characteristics associated with Songhai.<br>Remarks/Examples<br>Examples are Sunni Ali, Askia Mohammad the Great, gold, salt trade, cowries as a medium of exchange, Sankore University, slavery, professional army, provincial political structure. |
| **SS.912.W.3.13:** | Compare economic, political, and social developments in East, West, and South Africa. |
| **SS.912.W.3.14:** | Examine the internal and external factors that led to the fall of the empires of Ghana, Mali, and Songhai.<br>Remarks/Examples<br>Examples are disruption of trade, internal political struggles, Islamic invasions. |
| **SS.912.W.3.15:** | Analyze the legacies of the Olmec, Zapotec, and Chavin on later Meso and South American civilizations. |
| **SS.912.W.3.16:** | Locate major civilizations of Mesoamerica and Andean South America.<br>Remarks/Examples<br>Examples are Maya, Aztec, Inca. |
| **SS.912.W.3.17:** | Describe the roles of people in the Maya, Inca, and Aztec societies.<br>Remarks/Examples<br>Examples are class structure, family life, warfare, religious beliefs |

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| | and practices, slavery. |
| SS.912.W.3.18: | Compare the key economic, cultural, and political characteristics of the major civilizations of Meso and South America.<br>Remarks/Examples<br>Examples are agriculture, architecture, astronomy, literature, mathematics, trade networks, government. |
| SS.912.W.3.19: | Determine the impact of significant Meso and South American rulers such as Pacal the Great, Moctezuma I, and Huayna Capac. |
| SS.912.W.3.2: | Compare the major beliefs and principles of Judaism, Christianity, and Islam. |
| SS.912.W.3.3: | Determine the causes, effects, and extent of Islamic military expansion through Central Asia, North Africa, and the Iberian Peninsula. |
| SS.912.W.3.4: | Describe the expansion of Islam into India and the relationship between Muslims and Hindus. |
| SS.912.W.3.5: | Describe the achievements, contributions, and key figures associated with the Islamic Golden Age.<br>Remarks/Examples<br>Examples are Al-Ma'mun, Avicenna, Averroes, Algebra, Al-Razi, Alhambra, The Thousand and One Nights. |
| SS.912.W.3.6: | Describe key economic, political, and social developments in Islamic history.<br>Remarks/Examples<br>Examples are growth of the caliphate, division of Sunni and Shi'a, role of trade, dhimmitude, Islamic slave trade. |
| SS.912.W.3.7: | Analyze the causes, key events, and effects of the European response to Islamic expansion beginning in the 7th century.<br>Remarks/Examples<br>Examples are Crusades, Reconquista. |
| SS.912.W.3.8: | Identify important figures associated with the Crusades.<br>Remarks/Examples |

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| | Examples are Alexius Comnenus, Pope Urban, Bernard of Clairvaux, Godfrey of Bouillon, Saladin, Richard the Lionheart, Baybars, Louis IX. |
| **SS.912.W.3.9:** | Trace the growth of major sub-Saharan African kingdoms and empires.<br>Remarks/Examples<br>Examples are Ghana, Mali, Songhai. |
| **SS.912.W.4.1:** | Identify the economic and political causes for the rise of the Italian city-states (Florence, Milan, Naples, Rome, Venice). |
| **SS.912.W.4.10:** | Identify the major contributions of individuals associated with the Scientific Revolution.<br>Remarks/Examples<br>Examples are Francis Bacon, Nicholas Copernicus, Rene Descartes, Galileo Galilei, Johannes Kepler, Isaac Newton, Blaise Pascal, Vesalius. |
| **SS.912.W.4.11:** | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors. |
| **SS.912.W.4.2:** | Recognize major influences on the architectural, artistic, and literary developments of Renaissance Italy (Classical, Byzantine, Islamic, Western European). |
| **SS.912.W.4.3:** | Identify the major artistic, literary, and technological contributions of individuals during the Renaissance.<br>Remarks/Examples<br>Examples are Petrarch, Brunelleschi, Giotto, the Medici Family, Michelangelo, Leonardo da Vinci, Erasmus, Thomas More, Machiavelli, Shakespeare, Gutenberg, El Greco, Artemisia Gentileschi, Van Eyck. |
| **SS.912.W.4.4:** | Identify characteristics of Renaissance humanism in works of art.<br>Remarks/Examples<br>Examples are influence of classics, School of Athens. |
| **SS.912.W.4.5:** | Describe how ideas from the Middle Ages and Renaissance led to the |

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| | Scientific Revolution. |
| SS.912.W.4.6: | Describe how scientific theories and methods of the Scientific Revolution challenged those of the early classical and medieval periods. |
| SS.912.W.4.7: | Identify criticisms of the Roman Catholic Church by individuals such as Wycliffe, Hus and Erasmus and their impact on later reformers. |
| SS.912.W.4.8: | Summarize religious reforms associated with Luther, Calvin, Zwingli, Henry VIII, and John of Leyden and the effects of the Reformation on Europe.<br>Remarks/Examples<br>Examples are Catholic and Counter Reformation, political and religious fragmentation, military conflict, expansion of capitalism. |
| SS.912.W.4.9: | Analyze the Roman Catholic Church's response to the Protestant Reformation in the forms of the Counter and Catholic Reformation.<br>Remarks/Examples<br>Examples are Council of Trent, Thomas More, Ignatius of Loyola and the Jesuits, Teresa of Avila, Charles V. |

# Course: Latin American History- 2100360

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4438.aspx

## BASIC INFORMATION

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| **Course Title:** | Latin American History |
| **Course Number:** | 2100360 |
| **Course Abbreviated Title:** | LATIN AMER HIST |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Social Studies **SubSubject:** American and Western Hemispheric Histories |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | **Latin American History** - The grade 9-12 Latin American History course consists of the following content area strands: World History, American History, Geography, Humanities, Civics and Government. The primary content emphasis for this course pertains to the study of the chronological development development of the Latin American people by examining the history and culture of the region with emphasis on the Caribbean Basin, Central America and South America. Students will be exposed to the historical, geographic, political, economic, and sociological events which influenced the progression of Latin America including, but not limited to, indigenous Native American population prior to the arrival of the Europeans, Spanish heritage, influence and impact of the Catholic Church on Latin American cultures, evolution of political systems and philosophies in Latin American societies, interaction of science and Latin American cultures, Latin American nationalism, origin and course of economic systems and philosophies in Latin American |

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| | societies, influence of major historical figures and events in Latin American history, and contemporary Latin American affairs.<br><br>**Mathematics Benchmark Guidance** - Social Studies instruction should include opportunities for students to interpret and create representations of historical events and concepts using mathematical tables, charts, and graphs.<br><br>**Instructional Practices**<br>Teaching from well-written, grade-level instructional materials enhances students' content area knowledge and also strengthens their ability to comprehend longer, complex reading passages on any topic for any reason. Using the following instructional practices also helps student learning:<br><br>1. Reading assignments from longer text passages as well as shorter ones when text is extremely complex.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Asking high-level, text-specific questions and requiring high-level, complex tasks and assignments.<br>4. Requiring students to support answers with evidence from the text.<br>5. Providing extensive text-based research and writing opportunities (claims and evidence) |

## STANDARDS (79)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**
**MACC.912.S-ID.1: Summarize, represent and interpret data on a single count or**

**measurement variable.**

**MACC.912.S-IC Making Inferences and Justifying Conclusions**
**MACC.912.S-IC.2: Make inferences and justify conclusions from sample surveys, experiments, and observational studies.**

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| HE.912.C.2.4: | Evaluate how public health policies and government regulations can influence health promotion and disease prevention.<br>Remarks/Examples<br>Seat-belt enforcement, underage alcohol sales, reporting communicable diseases, child care, and AED availability. |
| LACC.910.RH.1.1: | Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. |
| LACC.910.RH.1.2: | Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text. |
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| LACC.910.RH.2.6: | Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. |
| LACC.910.RH.3.7: | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. |
| LACC.910.RH.3.8: | Assess the extent to which the reasoning and evidence in a text support the author's claims. |
| LACC.910.RH.3.9: | Compare and contrast treatments of the same topic in several primary and secondary sources. |
| LACC.910.RH.4.10: | By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently. |

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| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. |

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| | b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., |

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| | articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **SS.912.G.4.1:** | Interpret population growth and other demographic data for any given place. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SS.912.A.1.1:** | Describe the importance of historiography, which includes how historical knowledge is obtained and transmitted, when interpreting events in history. |
| **SS.912.A.1.2:** | Utilize a variety of primary and secondary sources to identify author, historical significance, audience, and authenticity to understand a historical period. |

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| [SS.912.A.1.3:]() | Utilize timelines to identify the time sequence of historical data. |
| [SS.912.A.1.4:]() | Analyze how images, symbols, objects, cartoons, graphs, charts, maps, and artwork may be used to interpret the significance of time periods and events from the past. |
| [SS.912.A.1.5:]() | Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources.<br>Remarks/Examples<br>Students should be encouraged to utilize FINDS (Focus, Investigate, Note, Develop, Score), Florida's research process model accessible at: http://www.fldoe.org/bii/Library_Media/pdf/12TotalFINDS.pdf |
| [SS.912.A.1.6:]() | Use case studies to explore social, political, legal, and economic relationships in history. |
| [SS.912.A.1.7:]() | Describe various socio-cultural aspects of American life including arts, artifacts, literature, education, and publications. |
| [SS.912.A.2.7:]() | Review the Native American experience.<br>Remarks/Examples<br>Examples may include, but are not limited to, westward expansion, reservation system, the Dawes Act, Wounded Knee Massacre, Sand Creek Massacre, Battle of Little Big Horn, Indian Schools, government involvement in the killing of the buffalo. |
| [SS.912.A.4.3:]() | Examine causes, course, and consequences of the Spanish American War.<br>Remarks/Examples<br>Examples may include, but are not limited to, Cuba as a protectorate, Yellow Journalism, sinking of the *Maine,* the Philippines, Commodore Dewey, the Rough Riders, acqusition of territories, the Treaty of Paris. |
| [SS.912.A.4.4:]() | Analyze the economic, military, and security motivations of the United States to complete the Panama Canal as well as major obstacles involved in its construction.<br>Remarks/Examples |

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| | Examples may include, but are not limited to, disease, environmental impact, challenges faced by various ethnic groups such as Africans and indigenous populations, shipping routes, increased trade, defense and independence for Panama. |
| SS.912.A.7.11: | Analyze the foreign policy of the United States as it relates to Africa, Asia, the Caribbean, Latin America, and the Middle East.<br>Remarks/Examples<br>Examples may include, but aren ot limited to, Haiti, Bosnia-Kosovo, Rwanda, Grenada, Camp David Accords, Iran Hostage Crisis, Lebanon, Iran-Iraq War, Reagan Doctrine, Iran-Contra Affair, Persian Gulf War. |
| SS.912.A.7.14: | Review the role of the United States as a participant in the global economy (trade agreements, international competition, impact on American labor, environmental concerns).<br>Remarks/Examples<br>Examples may include, but arenot limited to, NAFTA, World Trade Organization. |
| SS.912.C.4.3: | Assess human rights policies of the United States and other countries. |
| SS.912.C.4.4: | Compare indicators of democratization in multiple countries. |
| SS.912.E.3.1: | Demonstrate the impact of inflation on world economies.<br>Remarks/Examples<br>Examples are oil prices, 1973 oil crisis, Great Depression, World War II. |
| SS.912.G.1.1: | Design maps using a variety of technologies based on descriptive data to explain physical and cultural attributes of major world regions. |
| SS.912.G.1.2: | Use spatial perspective and appropriate geographic terms and tools, including the Six Essential Elements, as organizational schema to describe any given place. |
| SS.912.G.1.3: | Employ applicable units of measurement and scale to solve simple locational problems using maps and globes. |

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| SS.912.G.1.4: | Analyze geographic information from a variety of sources including primary sources, atlases, computer, and digital sources, Geographic Information Systems (GIS), and a broad variety of maps.<br>Remarks/Examples<br>Examples are thematic, contour, and dot-density. |
| SS.912.G.2.1: | Identify the physical characteristics and the human characteristics that define and differentiate regions.<br>Remarks/Examples<br>Examples of physical characteristics are climate, terrain, resources. Examples of human characteristics are religion, government, economy, demography. |
| SS.912.G.2.2: | Describe the factors and processes that contribute to the differences between developing and developed regions of the world. |
| SS.912.G.2.3: | Use geographic terms and tools to analyze case studies of regional issues in different parts of the world that have critical economic, physical, or political ramifications.<br>Remarks/Examples<br>Examples are desertification, global warming, cataclysmic natural disasters. |
| SS.912.G.4.2: | Use geographic terms and tools to analyze the push/pull factors contributing to human migration within and among places. |
| SS.912.G.4.3: | Use geographic terms and tools to analyze the effects of migration both on the place of origin and destination, including border areas. |
| SS.912.G.4.7: | Use geographic terms and tools to explain cultural diffusion throughout places, regions, and the world. |
| SS.912.G.4.9: | Use political maps to describe the change in boundaries and governments within continents over time. |
| SS.912.H.1.4: | Explain philosophical beliefs as they relate to works in the arts.<br>Remarks/Examples<br>Examples are classical architecture, protest music, Native American dance, Japanese Noh. |

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| SS.912.H.3.1: | Analyze the effects of transportation, trade, communication, science, and technology on the preservation and diffusion of culture. |
| SS.912.H.3.2: | Identify social, moral, ethical, religious, and legal issues arising from technological and scientific developments, and examine their influence on works of arts within a culture. |
| SS.912.W.1.1: | Use timelines to establish cause and effect relationships of historical events. |
| SS.912.W.1.2: | Compare time measurement systems used by different cultures.<br>Remarks/Examples<br>Examples are Chinese, Gregorian, and Islamic calendars, dynastic periods, decade, century, era. |
| SS.912.W.1.3: | Interpret and evaluate primary and secondary sources.<br>Remarks/Examples<br>Examples are artifacts, images, auditory and written sources. |
| SS.912.W.1.4: | Explain how historians use historical inquiry and other sciences to understand the past.<br>Remarks/Examples<br>Examples are archaeology, economics, geography, forensic chemistry, political science, physics. |
| SS.912.W.1.5: | Compare conflicting interpretations or schools of thought about world events and individual contributions to history (historiography). |
| SS.912.W.1.6: | Evaluate the role of history in shaping identity and character.<br>Remarks/Examples<br>Examples are ethnic, cultural, personal, national, religious. |
| SS.912.W.3.15: | Analyze the legacies of the Olmec, Zapotec, and Chavin on later Meso and South American civilizations. |
| SS.912.W.3.16: | Locate major civilizations of Mesoamerica and Andean South America.<br>Remarks/Examples<br>Examples are Maya, Aztec, Inca. |

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| **SS.912.W.3.17:** | Describe the roles of people in the Maya, Inca, and Aztec societies.<br>Remarks/Examples<br>Examples are class structure, family life, warfare, religious beliefs and practices, slavery. |
| **SS.912.W.3.18:** | Compare the key economic, cultural, and political characteristics of the major civilizations of Meso and South America.<br>Remarks/Examples<br>Examples are agriculture, architecture, astronomy, literature, mathematics, trade networks, government. |
| **SS.912.W.3.19:** | Determine the impact of significant Meso and South American rulers such as Pacal the Great, Moctezuma I, and Huayna Capac. |
| **SS.912.W.4.11:** | Summarize the causes that led to the Age of Exploration, and identify major voyages and sponsors. |
| **SS.912.W.4.12:** | Evaluate the scope and impact of the Columbian Exchange on Europe, Africa, Asia, and the Americas. |
| **SS.912.W.4.13:** | Examine the various economic and political systems of Portugal, Spain, the Netherlands, France, and England in the Americas. |
| **SS.912.W.4.14:** | Recognize the practice of slavery and other forms of forced labor experienced during the 13th through 17th centuries in East Africa, West Africa, Europe, Southwest Asia, and the Americas. |
| **SS.912.W.4.15:** | Explain the origins, developments, and impact of the trans-Atlantic slave trade between West Africa and the Americas. |
| **SS.912.W.5.7:** | Describe the causes and effects of 19th Latin American and Caribbean independence movements led by people including Bolivar, de San Martin, and L' Ouverture. |
| **SS.912.W.6.4:** | Describe the 19th and early 20th century social and political reforms and reform movements and their effects in Africa, Asia, Europe, the United States, the Caribbean, and Latin America.<br>Remarks/Examples<br>Examples are Meiji Reforms, abolition of slavery in the British Empire, expansion of women's rights, labor laws. |
| **SS.912.W.8.4:** | Summarize the causes and effects of the arms race and proxy wars in Africa, Asia, Latin America, and the Middle East. |

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| **SS.912.W.8.7:** | Compare post-war independence movements in African, Asian, and Caribbean countries. |
| **SS.912.W.8.8:** | Describe the rise and goals of nationalist leaders in the post-war era and the impact of their rule on their societies.<br>Remarks/Examples<br>Examples are Mahatma Ghandi, Fidel Castro, Gamal Abdel Nasser, Francois 'Papa Doc' Duvalier, Jawaharlal Nehru. |
| **SS.912.W.8.9:** | Analyze the successes and failures of democratic reform movements in Africa, Asia, the Caribbean, and Latin America. |
| **SS.912.W.9.4:** | Describe the causes and effects of twentieth century nationalist conflicts.<br>Remarks/Examples<br>Examples are Cyprus, Kashmir, Tibet, Northern Ireland. |
| **SS.912.W.9.5:** | Assess the social and economic impact of pandemics on a global scale, particularly within the developing and under-developed world. |
| **SS.912.W.9.6:** | Analyze the rise of regional trade blocs such as the European Union and NAFTA, and predict the impact of increased globalization in the 20th and 21st centuries. |

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| | water.<br>Remarks/Examples<br>Explain how the oceans act as sources/sinks of heat energy, store carbon dioxide mostly as dissolved HCO3– and CaCO3 as precipitate or biogenic carbonate deposits, which have an impact on climate change. |
| **SC.912.L.17.10:** | Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle. |
| **SC.912.L.17.11:** | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| **SC.912.L.17.13:** | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| **SC.912.L.17.16:** | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| **SC.912.L.17.4:** | Describe changes in ecosystems resulting from seasonal variations, climate change and succession. |
| **SC.912.L.17.5:** | Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.17.2; SC.912.L.17.4; SC.912.L.17.8; SC.912.N.1.4. |
| **SC.912.L.17.7:** | Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems. |
| **SC.912.L.18.2:** | Describe the important structural characteristics of monosaccharides, disaccharides, and polysaccharides and explain the functions of carbohydrates in living things. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome. |

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| | Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.2.1: | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| SC.912.N.2.4: | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability. |

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| | Remarks/Examples<br><br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,** |

10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

<u>For Students in Grades 9-10</u>

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

<u>For Students in Grades 11-12</u>

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or

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| | technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation. |

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| | Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations |

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| | of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.20:** | Describe the measurable properties of waves and explain the relationships among them and how these properties change when |

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| | the wave moves from one medium to another.<br>Remarks/Examples |
| | Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |
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## RELATED GLOSSARY TERM DEFINITIONS (33)

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| **Abiotic:** | An environmental factor not associated with or derived from living organisms. |
| **Biotic:** | Factors in an environment relating to, caused by, or produced by living organisms. |
| **Carbohydrate:** | Any of a group of organic compounds that includes sugars, starches, celluloses, and gums and serves as a major energy source in the diet of animals. These compounds are produced by photosynthetic plants and contain only carbon, hydrogen, and oxygen, usually in the ratio 1:2:1. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Disaccharide:** | Any of a class of sugars, including lactose and sucrose, that are composed of two monosaccharides. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Experiment:** | A procedure that is carried out and repeated under controlled |

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| | conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Latitude:** | A measure of relative position north or south on the Earth's surface, measured in degrees from the equator, which has a latitude of 0°, with the poles having a latitude of 90° north and south. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Monosaccharide:** | Any of a class of carbohydrates that cannot be broken down to simpler sugars by hydrolysis and that constitute the building blocks of oligosaccharides and polysaccharides. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Observation :** | What one has observed using senses or instruments. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of |

# Course: Marine Science 2 Honors- 2002530

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4363.aspx

## BASIC INFORMATION

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| **Course Title:** | Marine Science 2 Honors |
| **Course Number:** | 2002530 |
| **Course Abbreviated Title:** | MARINE SCI 2 HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Integrated Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | While the content focus of this course is consistent with the Marine Science 2 course, students will explore these concepts in greater depth. In general, the academic pace and rigor will be greatly increased for honors level course work. Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural |

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| | phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>**Instructional Practices** Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (67)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.

- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. |

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| | a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and |

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| | digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and |

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| | information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or* |

# Course: Physics 1 Honors- 2003390

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4317.aspx

## BASIC INFORMATION

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| **Course Title:** | Physics 1 Honors |
| **Course Number:** | 2003390 |
| **Course Abbreviated Title:** | PHYS 1 HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | While the content focus of this course is consistent with the Physics I course, students will explore these concepts in greater depth. In general, the academic pace and rigor will be greatly increased for honors level course work. Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with |

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| | data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (90)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating |

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| | or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, |

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| | word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, |

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| | between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |

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| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.A-CED.1.4:** | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*<br>Remarks/Examples<br>Algebra 1, Unit 1: Limit A.CED.4 to formulas which are linear in the variable of interest.<br><br>Algebra 1, Unit 4: Extend A.CED.4 to formulas involving squared variables. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for |

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| | standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-GMD.1.3:** | Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling |

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| | situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-VM.1.1:** | Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, \|v\|, \|\|v\|\|, v). |
| **MACC.912.N-VM.1.2:** | Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point. |
| **MACC.912.N-VM.1.3:** | Solve problems involving velocity and other quantities that can be represented by vectors. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to |

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| | compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association. |

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| | Remarks/Examples<br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.5.2:** | Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.<br>Remarks/Examples<br>Identify patterns that influence the formation, heirarchy, and motions of the various kinds of objects in the solar system and the role of gravity and inertia on these motions (include the Sun, Earth, and Moon, planets, satellites, comets, asteroids, star clusters, galaxies, galaxy clusters). Recognize that the universe contains many billions of galaxies, and each galaxy contains many billions of stars. Recognize that constellations are contrived associations of stars that do not reflect functional relationships in space.<br><br>CCSS Connections: MACC.K12.MP.7: Look for and make use of structure. |
| **SC.912.E.5.6:** | Develop logical connections through physical principles, including Kepler's and Newton's Laws about the relationships and the effects of Earth, Moon, and Sun on each other.<br>Remarks/Examples<br>Explain that Kepler's laws determine the orbits of objects in the |

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| | solar system and recognize that Kepler's laws are a direct consequence of Newton's Law of Universal Gravitation and Laws of Motion. |
| SC.912.E.5.8: | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used to detect and interpret information from electromagnetic radiation sources. |
| SC.912.L.18.12: | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.2.2: | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not |

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| | adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,** |

4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. **Plan investigations,** (Design and evaluate a scientific investigation).
6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the

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| | narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>For Students in Grades 11-12<br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and |

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| | coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples |

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| | Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.3.2: | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.3.3: | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| SC.912.N.3.4: | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| SC.912.N.3.5: | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature. |

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| | CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.13:** | Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.<br>Remarks/Examples<br>Using Coulomb's law, determine the force on a stationary charge due to other stationary charges, and explain that this force is many times greater than the gravitational force. Recognize the relationship between forces and their associated potential energies and that the electric field is directly related to the rate of change of the electric potential from point to point in space. |

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| SC.912.P.10.14: | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| SC.912.P.10.15: | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |
| SC.912.P.10.16: | Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.<br>Remarks/Examples<br>Explain that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers. |
| SC.912.P.10.17: | Explore the theory of electromagnetism by explaining electromagnetic waves in terms of oscillating electric and magnetic fields.<br>Remarks/Examples<br>Recognize that an oscillating charge creates an oscillating electric field which gives rise to electromagnetic waves. Recognize a changing magnetic field makes an electric field, and a changing electric field makes a magnetic field, and these phenomena are expressed mathematically through the Faraday law and the Ampere-Maxwell law. |
| SC.912.P.10.18: | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving |

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| | wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.20:** | Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.<br>Remarks/Examples<br>Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.22:** | Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.<br>Remarks/Examples<br>Use examples such as converging/diverging lenses and convex/concave mirrors. Use a ray diagram to determine the approximate location and size of the image, and the mirror equation to obtain numerical information about image distance and image size. |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and |

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| | quantitatively. |
| SC.912.P.10.4: | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| SC.912.P.10.5: | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| SC.912.P.10.6: | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| SC.912.P.10.7: | Distinguish between endothermic and exothermic chemical processes.<br>Remarks/Examples<br>Classify chemical reactions and phase changes as exothermic (release thermal energy) or endothermic (absorb thermal energy). |
| SC.912.P.10.8: | Explain entropy's role in determining the efficiency of processes that convert energy to work.<br>Remarks/Examples<br>Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness (entropy). Describe entropy as a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system. |
| SC.912.P.12.1: | Distinguish between scalar and vector quantities and assess which should be used to describe an event.<br>Remarks/Examples<br>Distinguish between vector quantities (e.g., displacement, velocity, acceleration, force, and linear momentum) and scalar quantities (e.g., distance, speed, energy, mass, work). |

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| | MACC.912.N-VM.1.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, F = ma). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F1 on 1 (Newton's third law). |
| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.12.6:** | Qualitatively apply the concept of angular momentum. |

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| | Remarks/Examples<br>Explain that angular momentum is rotational analogy to linear momentum (e.g. Because angular momentum is conserved, a change in the distribution of mass about the axis of rotation will cause a change in the rotational speed [ice skater spinning]). |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.12.8:** | Recognize that Newton's Laws are a limiting case of Einstein's Special Theory of Relativity at speeds that are much smaller than the speed of light.<br>Remarks/Examples<br>Recognize that the speed of light in any reference frame is the central postulate of the Special Theory of Relativity. As speeds approach zero, Special Relativity tends towards equivalence with Newton's Laws of Motion. |
| **SC.912.P.12.9:** | Recognize that time, length, and energy depend on the frame of reference.<br>Remarks/Examples<br>The energy $E$ and the momentum $p$ depend on the frame of reference in which they are measured (e.g. Lorentz contraction). |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic |

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| | theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and "gold foil" experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

## RELATED GLOSSARY TERM DEFINITIONS (74)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |
| **Angular momentum:** | A vector quantity that is a measure of the rotational momentum of a rotating body or system, that is equal in classical physics to the product of the angular velocity of the body or system and its moment of inertia with respect to the rotation axis, and that is directed along the rotation axis. |
| **Asteroid:** | A rocky or metallic object that orbits the Sun and is much smaller than a planet. |
| **Atom:** | The smallest unit of a chemical element that can still retain the |

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| | properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Axis:** | The imaginary line on which an object rotates (e.g., Earth's axis runs through Earth between the North Pole and the South Pole); an imaginary straight line that runs through a body; a reference to the line in a coordinate system or graph. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Comet:** | A celestial body that appears as a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, that consists primarily of ice and dust, and that often develops one or more long tails when near the sun. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electric potential:** | A measure of the work required by an electric field to move electric charges. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the |

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| | longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Entropy:** | A measure of the unavailable energy in a closed thermodynamic system that is also usually considered to be a measure of the system's disorder, that is a property of the system's state, and that varies directly with any reversible change in heat in the system and inversely with the temperature of the system. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Galaxy:** | A large collection of stars, gases, and dust that are part of the universe (e.g., the Milky Way galaxy) bound together by gravitational forces. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Gravity:** | The force of attraction between any two objects. |

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| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Magnet:** | An object that produces a magnetic field and that has the property, either natural or induced, of attracting iron or steel. |
| **Magnetic:** | Having the property of attracting iron and certain other materials by virtue of a field of force. |
| **Magnetic field:** | The region where magnetic force exists around magnets or electric currents. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific |

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| | models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Moon:** | A natural satellite that revolves around a planet. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Relativity (special theory of):** | The physical theory of space and time developed by Albert Einstein, based on the postulates that all the laws of physics are equally valid in all frames of reference moving at a uniform velocity and that the speed of light from a uniformly moving source is always the same, regardless of how fast or slow the source or its observer is moving. The theory has as consequences the relativistic mass increase of rapidly moving objects, the Lorentz-Fitzgerald contraction, time dilatation, and the principle of mass-energy equivalence. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |

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| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Vibration:** | A periodic and repetitive movement around an equilibrium point. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Physics 1 for Credit Recovery- 2003385

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4323.aspx

## BASIC INFORMATION

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| **Course Title:** | Physics 1 for Credit Recovery |
| **Course Number:** | 2003385 |
| **Course Abbreviated Title:** | PHYS 1 CR |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Multiple (M) - Course length can vary |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:** Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.<br><br>Instructional Practices<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (72)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a |

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| | process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and |

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| | creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |

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| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and |

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| | techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| LACC.1112.WHST.2.4: | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| LACC.1112.WHST.2.5: | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| LACC.1112.WHST.2.6: | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| LACC.1112.WHST.3.7: | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| MACC.912.F-IF.2.4: | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root |

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| | functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and |

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| | $y=100^2$ |
| MACC.912.G-MG.1.2: | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| MACC.912.N-Q.1.1: | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| MACC.912.N-Q.1.3: | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| MACC.912.N-VM.1.3: | Solve problems involving velocity and other quantities that can be represented by vectors. |
| MACC.912.S-ID.1.1: | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| MACC.912.S-ID.1.4: | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| MACC.912.S-ID.2.5: | Summarize categorical data for two categories in two-way |

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| | frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **SC.912.E.5.2:** | Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.<br>Remarks/Examples<br>Identify patterns that influence the formation, heirarchy, and motions of the various kinds of objects in the solar system and the role of gravity and inertia on these motions (include the Sun, Earth, and Moon, planets, satellites, comets, asteroids, star clusters, galaxies, galaxy clusters). Recognize that the universe contains many billions of galaxies, and each galaxy contains many billions of stars. Recognize that constellations are contrived associations of stars that do not reflect functional relationships in space.<br><br>CCSS Connections: MACC.K12.MP.7: Look for and make use of structure. |
| **SC.912.E.5.6:** | Develop logical connections through physical principles, including Kepler's and Newton's Laws about the relationships and the effects of Earth, Moon, and Sun on each other.<br>Remarks/Examples<br>Explain that Kepler's laws determine the orbits of objects in the solar system and recognize that Kepler's laws are a direct consequence of Newton's Law of Universal Gravitation and Laws of Motion. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and |

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| | which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.2.4: | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.1.1: | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see** |

**what is already known,**

4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. **Plan investigations,** (Design and evaluate a scientific investigation).
6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

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| | LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and |

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| | coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of |

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| | natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |

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| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br><br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br><br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.13:** | Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.<br>Remarks/Examples<br><br>Using Coulomb's law, determine the force on a stationary charge due to other stationary charges, and explain that this force is many times greater than the gravitational force. Recognize the relationship between forces and their associated potential energies and that the electric field is directly related to the rate of change of the electric potential from point to point in space. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br><br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br><br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |

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| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br><br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br><br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.20:** | Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.<br>Remarks/Examples<br><br>Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br><br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.22:** | Construct ray diagrams and use thin lens and mirror equations to |

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| | locate the images formed by lenses and mirrors.<br>Remarks/Examples<br>Use examples such as converging/diverging lenses and convex/concave mirrors. Use a ray diagram to determine the approximate location and size of the image, and the mirror equation to obtain numerical information about image distance and image size. |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and quantitatively. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.12.1:** | Distinguish between scalar and vector quantities and assess which should be used to describe an event.<br>Remarks/Examples<br>Distinguish between vector quantities (e.g., displacement, velocity, acceleration, force, and linear momentum) and scalar quantities (e.g., distance, speed, energy, mass, work).<br><br>MACC.912.N-VM.1.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |

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| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, F = ma). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F1 on 1 (Newton's third law). |
| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.12.9:** | Recognize that time, length, and energy depend on the frame of reference.<br>Remarks/Examples<br>The energy *E* and the momentum *p* depend on the frame of reference in which they are measured (e.g. Lorentz contraction). |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples |

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| | Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and "gold foil" experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

## RELATED GLOSSARY TERM DEFINITIONS (61)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |
| **Asteroid:** | A rocky or metallic object that orbits the Sun and is much smaller than a planet. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |

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| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Comet:** | A celestial body that appears as a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, that consists primarily of ice and dust, and that often develops one or more long tails when near the sun. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electric potential:** | A measure of the work required by an electric field to move electric charges. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |

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| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Galaxy:** | A large collection of stars, gases, and dust that are part of the universe (e.g., the Milky Way galaxy) bound together by gravitational forces. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Gravity:** | The force of attraction between any two objects. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |

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| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Moon:** | A natural satellite that revolves around a planet. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which |

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| | electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Vibration:** | A periodic and repetitive movement around an equilibrium point. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Physics 1- 2003380

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4401.aspx

## BASIC INFORMATION

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| **Course Title:** | Physics 1 |
| **Course Number:** | 2003380 |
| **Course Abbreviated Title:** | PHYS 1 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br><u>Instructional Practices:</u><br><br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (72)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a |

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| | process, phenomenon, or concept, resolving conflicting information when possible. |
| LACC.1112.RST.4.10: | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| MACC.912.S-ID.1.2: | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| MACC.912.S-ID.1.3: | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| LACC.1112.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and |

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| | creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |

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| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and |

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| | techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root |

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| | functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and |

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| | $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-VM.1.3:** | Solve problems involving velocity and other quantities that can be represented by vectors. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way |

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| | frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **SC.912.E.5.2:** | Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.<br>Remarks/Examples<br>Identify patterns that influence the formation, heirarchy, and motions of the various kinds of objects in the solar system and the role of gravity and inertia on these motions (include the Sun, Earth, and Moon, planets, satellites, comets, asteroids, star clusters, galaxies, galaxy clusters). Recognize that the universe contains many billions of galaxies, and each galaxy contains many billions of stars. Recognize that constellations are contrived associations of stars that do not reflect functional relationships in space.<br><br>CCSS Connections: MACC.K12.MP.7: Look for and make use of structure. |
| **SC.912.E.5.6:** | Develop logical connections through physical principles, including Kepler's and Newton's Laws about the relationships and the effects of Earth, Moon, and Sun on each other.<br>Remarks/Examples<br>Explain that Kepler's laws determine the orbits of objects in the solar system and recognize that Kepler's laws are a direct consequence of Newton's Law of Universal Gravitation and Laws of Motion. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and |

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| | which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.2.4: | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.1.1: | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see** |

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| | **what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and**<br>11. **Evaluate the merits of the explanations produced by others.**<br><br>Remarks/Examples |
| | Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science<br><br><u>For Students in Grades 9-10</u><br><br>LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. |

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| | LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and |

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| | coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of |

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| | natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |

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| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br><br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br><br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.13:** | Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.<br>Remarks/Examples<br><br>Using Coulomb's law, determine the force on a stationary charge due to other stationary charges, and explain that this force is many times greater than the gravitational force. Recognize the relationship between forces and their associated potential energies and that the electric field is directly related to the rate of change of the electric potential from point to point in space. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br><br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br><br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |

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| SC.912.P.10.18: | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| SC.912.P.10.2: | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| SC.912.P.10.20: | Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.<br>Remarks/Examples<br>Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |
| SC.912.P.10.21: | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| SC.912.P.10.22: | Construct ray diagrams and use thin lens and mirror equations to |

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| | locate the images formed by lenses and mirrors.<br>Remarks/Examples<br>Use examples such as converging/diverging lenses and convex/concave mirrors. Use a ray diagram to determine the approximate location and size of the image, and the mirror equation to obtain numerical information about image distance and image size. |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and quantitatively. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.12.1:** | Distinguish between scalar and vector quantities and assess which should be used to describe an event.<br>Remarks/Examples<br>Distinguish between vector quantities (e.g., displacement, velocity, acceleration, force, and linear momentum) and scalar quantities (e.g., distance, speed, energy, mass, work).<br><br>MACC.912.N-VM.1.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |

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| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, F = ma). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F1 on 1 (Newton's third law). |
| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.12.9:** | Recognize that time, length, and energy depend on the frame of reference.<br>Remarks/Examples<br>The energy *E* and the momentum *p* depend on the frame of reference in which they are measured (e.g. Lorentz contraction). |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples |

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| | Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| SC.912.P.8.3: | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and "gold foil" experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

## RELATED GLOSSARY TERM DEFINITIONS (61)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |
| **Asteroid:** | A rocky or metallic object that orbits the Sun and is much smaller than a planet. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |

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| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Comet:** | A celestial body that appears as a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, that consists primarily of ice and dust, and that often develops one or more long tails when near the sun. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electric potential:** | A measure of the work required by an electric field to move electric charges. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |

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| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Galaxy:** | A large collection of stars, gases, and dust that are part of the universe (e.g., the Milky Way galaxy) bound together by gravitational forces. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Gravity:** | The force of attraction between any two objects. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |

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| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Moon:** | A natural satellite that revolves around a planet. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which |

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| | electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Vibration:** | A periodic and repetitive movement around an equilibrium point. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Chemistry 2- 2003360

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4391.aspx

## BASIC INFORMATION

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| **Course Title:** | Chemistry 2 |
| **Course Number:** | 2003360 |
| **Course Abbreviated Title:** | CHEM 2 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br><u>Instructional Practices:</u> Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (69)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information |

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| | when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. |

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| | d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.* |

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| | a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage |

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| | the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions |

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| | and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |

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| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). |

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| | Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.L.17.17:** | Assess the effectiveness of innovative methods of protecting the environment. |
| **SC.912.L.17.19:** | Describe how different natural resources are produced and how their rates of use and renewal limit availability. |

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| SC.912.L.17.20: | Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.17.11, SC.912.L.17.13, SC.912.N.1.3. |
| SC.912.L.18.1: | Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.18.11. |
| SC.912.L.18.11: | Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity. |
| SC.912.L.18.12: | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| SC.912.L.18.2: | Describe the important structural characteristics of monosaccharides, disaccharides, and polysaccharides and explain the functions of carbohydrates in living things. |
| SC.912.L.18.3: | Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes. |
| SC.912.L.18.4: | Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structure and function of enzymes. |
| SC.912.N.1.5: | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |

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| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.2.1: | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| SC.912.N.2.2: | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not |

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| | adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage). |

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| | 7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and**<br>11. **Evaluate the merits of the explanations produced by others.**<br><br>Remarks/Examples |
| | Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science<br><br><u>For Students in Grades 9-10</u><br><br>LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of |

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| | information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and |

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| | critique the reasoning of others |
| [SC.912.N.1.4:]() | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| [SC.912.N.2.4:]() | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| [SC.912.N.2.5:]() | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative |

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| | and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |

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| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe |

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| | the transformation of energy as a pendulum swings. |
| **SC.912.P.10.8:** | Explain entropy's role in determining the efficiency of processes that convert energy to work.<br>Remarks/Examples<br>Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness (entropy). Describe entropy as a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system. |
| **SC.912.P.8.10:** | Describe oxidation-reduction reactions in living and non-living systems.<br>Remarks/Examples<br>Identify the substance(s) losing and gaining electrons in oxidation-reduction reactions. Discuss voltaic cells, various types of batteries, electrolysis of water, smelting and purification of metals, electrolysis of brine versus molten NaCl, neutralization reactions, electrolytic cells, and living systems (photosynthesis and cellular respiration). |
| **SC.912.P.8.12:** | Describe the properties of the carbon atom that make the diversity of carbon compounds possible.<br>Remarks/Examples<br>Explain how the bonding characteristics of carbon lead to a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules. |
| **SC.912.P.8.13:** | Identify selected functional groups and relate how they contribute to properties of carbon compounds.<br>Remarks/Examples<br>Recognize functional groups in structural formulas of carbon molecules (e.g. sugars, proteins, nucleotides, amino acids, hydroxyl groups which form alcohols, carbonyl groups which form aldehydes / ketones, carboxyl groups which form carboxylic acids, etc.). |

## RELATED GLOSSARY TERM DEFINITIONS (45)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Activation energy:** | The least amount of energy required to start a particular chemical reaction. |
| **Amino acid:** | An organic molecule containing an amino group (-NH2), a carboxyl (-COOH) group, and a variable side chain (R group) that distinguishes the amino acid. Proteins are synthesized from amino acids. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Carbohydrate:** | Any of a group of organic compounds that includes sugars, starches, celluloses, and gums and serves as a major energy source in the diet of animals. These compounds are produced by photosynthetic plants and contain only carbon, hydrogen, and oxygen, usually in the ratio 1:2:1. |
| **Catalyst:** | A substance that speeds up or slows down the rate of a reaction without being consumed or altered. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Disaccharide:** | Any of a class of sugars, including lactose and sucrose, that are composed of two monosaccharides. |
| **Diversity:** | The different species in a given area or specific period of time. |

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| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of $9.107 \times 10^{-28}$ grams and an electric charge of approximately $-1.602 \times 10^{-19}$ coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Entropy:** | A measure of the unavailable energy in a closed thermodynamic system that is also usually considered to be a measure of the system's disorder, that is a property of the system's state, and that varies directly with any reversible change in heat in the system and inversely with the temperature of the system. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Enzyme:** | Any of numerous proteins produced in living cells that accelerate or catalyze chemical reactions. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fatty acid:** | Any of a large group of organic acids, especially those found in animal and vegetable fats and oils. Fatty acids are mainly composed of long chains of hydrocarbons ending in a carboxyl group. A fatty acid is saturated when the bonds between carbon atoms are all single bonds. It is unsaturated when any of these bonds is a double bond. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Membrane:** | A thin layer of tissue that surrounds or lines a cell, a group of cells, or a cavity; any barrier separating two fluids. |

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| **Metal:** | Any of a category of electropositive elements that usually have a shiny surface, are generally good conductors of heat and electricity, and can be melted or fused, hammered into thin sheets, or drawn into wires. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Monosaccharide:** | Any of a class of carbohydrates that cannot be broken down to simpler sugars by hydrolysis and that constitute the building blocks of oligosaccharides and polysaccharides. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Natural resource:** | Something, such as a forest, a mineral deposit, or fresh water, that is found in nature and is necessary or useful to humans. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Phospholipid:** | Any of various phosphorus-containing lipids, such as lecithin, that are composed mainly of fatty acids, a phosphate group, and a simple organic molecule such as glycerol. |
| **Polysaccharide:** | Any of a class of carbohydrates, such as starch and cellulose, consisting of a number of monosaccharides joined by glycosidic bonds. |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer |

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| | space is the region of the universe beyond Earth's atmosphere. |
| **Steroid:** | Any of numerous naturally occurring or synthetic fat-soluble organic compounds having, as a basis, 17 carbon atoms arranged in four rings and including the sterols and bile acids, adrenal and sex hormones, certain natural drugs such as digitalis compounds, and the precursors of certain vitamins. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Triglyceride:** | A naturally occurring ester of three fatty acids and glycerol that is the chief constituent of fats and oils. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |

# Course: Chemistry 1 Honors- 2003350

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4380.aspx

## BASIC INFORMATION

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| **Course Title:** | Chemistry 1 Honors |
| **Course Number:** | 2003350 |
| **Course Abbreviated Title:** | CHEM 1 HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | While the content focus of this course is consistent with the Chemistry I course, students will explore these concepts in greater depth. In general, the academic pace and rigor will be greatly increased for honors level course work. Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural |

phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).

**Special Notes:**

Instructional Practices:
Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:

1. Ensuring wide reading from complex text that varies in length.
2. Making close reading and rereading of texts central to lessons.
3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.
4. Emphasizing students supporting answers based upon evidence from the text.
5. Providing extensive research and writing opportunities (claims and evidence).

**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)

- Asking questions (for science) and defining problems (for engineering).
- Developing and using models.
- Planning and carrying out investigations.
- Analyzing and interpreting data.
- Using mathematics, information and computer technology, and computational thinking.
- Constructing explanations (for science) and designing solutions (for engineering).
- Engaging in argument from evidence.
- Obtaining, evaluating, and communicating information.

## STANDARDS (83)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.910.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. |
| **LACC.910.RST.1.2:** | Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. |
| **LACC.910.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. |
| **LACC.910.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. |
| **LACC.910.RST.2.5:** | Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). |
| **LACC.910.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. |
| **LACC.910.RST.3.7:** | Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an |

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| | equation) into words. |
| **LACC.910.RST.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem. |
| **LACC.910.RST.3.9:** | Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **LACC.910.RST.4.10:** | By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or |

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| | distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient |

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| | facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, |

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| | reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more |

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| | complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples |

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| | Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data |

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| | (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.L.17.15:** | Discuss the effects of technology on environmental quality. |
| **SC.912.L.17.19:** | Describe how different natural resources are produced and how their rates of use and renewal limit availability. |

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| **SC.912.L.18.12:** | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and** |

11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

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| | Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br><br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br><br>Recognize that contributions to science can be made and have been made by people from all over the world. |

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| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, |

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| | and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable |

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| | arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |

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| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.<br>Remarks/Examples<br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives |

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| | have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br><br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br><br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br><br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br><br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum. |

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| | Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.10.7:** | Distinguish between endothermic and exothermic chemical processes.<br>Remarks/Examples<br>Classify chemical reactions and phase changes as exothermic (release thermal energy) or endothermic (absorb thermal energy). |
| **SC.912.P.10.8:** | Explain entropy's role in determining the efficiency of processes that convert energy to work.<br>Remarks/Examples<br>Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness (entropy). Describe entropy as a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system. |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship $E = hv$). |
| **SC.912.P.12.10:** | Interpret the behavior of ideal gases in terms of kinetic molecular theory.<br>Remarks/Examples<br>Using the kinetic molecular theory, explain the behavior of gases and the relationship between pressure and volume (Boyle's law), volume and temperature (Charles's law), pressure and temperature (Gay-Lussac's law), and number of particles in a gas sample (Avogadro's hypothesis). |
| **SC.912.P.12.11:** | Describe phase transitions in terms of kinetic molecular theory.<br>Remarks/Examples<br>Explain, at the molecular level, the behavior of matter as it undergoes phase transitions. |

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| SC.912.P.12.12: | Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.<br>Remarks/Examples<br>Various factors could include: temperature, pressure, solvent and/or solute concentration, sterics, surface area, and catalysts. The rate of reaction is determined by the activation energy, and the pathway of the reaction can be shorter in the presence of enzymes or catalysts. Examples may include: decomposition of hydrogen peroxide using manganese (IV) oxide; nitration of benzene using concentrated sulfuric acid; hydrogenation of a C=C double bond using nickel. |
| SC.912.P.12.13: | Explain the concept of dynamic equilibrium in terms of reversible processes occurring at the same rates.<br>Remarks/Examples<br>Identify and explain the factors that affect the rate of dissolving (e.g., temperature, concentration, surface area, pressure, mixing). Explain that equilibrium is established when forward and reverse-reaction rates are equal. |
| SC.912.P.8.1: | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| SC.912.P.8.10: | Describe oxidation-reduction reactions in living and non-living systems.<br>Remarks/Examples<br>Identify the substance(s) losing and gaining electrons in oxidation-reduction reactions. Discuss voltaic cells, various types of batteries, electrolysis of water, smelting and purification of metals, electrolysis of brine versus molten NaCl, neutralization reactions, electrolytic cells, and living systems (photosynthesis and cellular respiration). |
| SC.912.P.8.11: | Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.<br>Remarks/Examples<br>Use experimental data to illustrate and explain the pH scale to |

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| | characterize acid and base solutions. Compare and contrast the strengths of various common acids and bases. |
| **SC.912.P.8.12:** | Describe the properties of the carbon atom that make the diversity of carbon compounds possible.<br>Remarks/Examples<br>Explain how the bonding characteristics of carbon lead to a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules. |
| **SC.912.P.8.13:** | Identify selected functional groups and relate how they contribute to properties of carbon compounds.<br>Remarks/Examples<br>Recognize functional groups in structural formulas of carbon molecules (e.g. sugars, proteins, nucleotides, amino acids, hydroxyl groups which form alcohols, carbonyl groups which form aldehydes / ketones, carboxyl groups which form carboxylic acids, etc.). |
| **SC.912.P.8.2:** | Differentiate between physical and chemical properties and physical and chemical changes of matter.<br>Remarks/Examples<br>Discuss volume, compressibility, density, conductivity, malleability, reactivity, molecular composition, freezing, melting and boiling points. Describe simple laboratory techniques that can be used to separate homogeneous and heterogeneous mixtures (e.g. filtration, distillation, chromatography, evaporation). |
| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and “gold foil” experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

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| SC.912.P.8.4: | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.P.8.5: | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br>Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell. |
| SC.912.P.8.6: | Distinguish between bonding forces holding compounds together and other attractive forces, including hydrogen bonding and van der Waals forces.<br>Remarks/Examples<br>Describe how atoms combine to form molecules through ionic, covalent, and hydrogen bonding. Compare and contrast the characteristics of the interactions between atoms in ionic and covalent compounds and how these bonds form. Use electronegativity to explain the difference between polar and nonpolar covalent bonds. |
| SC.912.P.8.7: | Interpret formula representations of molecules and compounds in terms of composition and structure.<br>Remarks/Examples<br>Write chemical formulas for simple covalent (HCl, SO2, CO2, and CH4), ionic ($Na+ + Cl- \rightarrow NaCl$) and molecular (O2, H2O) compounds. Predict the formulas of ionic compounds based on the number of valence electrons and the charges on the ions. |

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| SC.912.P.8.8: | Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions. Remarks/Examples<br>Classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement, and combustion. |
| SC.912.P.8.9: | Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions. Remarks/Examples<br>Recognize one mole equals 6.02 x 10^23 particles (atoms or molecules). Determine number of particles for elements and compounds using the mole concept, in terms of number of particles, mass, and the volume of an ideal gas at specified conditions of temperature and pressure. Use experimental data to determine percent yield, empirical formulas, molecular formulas, and calculate the mass-to-mass stoichiometry for a chemical reaction. |

## RELATED GLOSSARY TERM DEFINITIONS (69)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Activation energy:** | The least amount of energy required to start a particular chemical reaction. |
| **Amino acid:** | An organic molecule containing an amino group (-NH2), a carboxyl (-COOH) group, and a variable side chain (R group) that distinguishes the amino acid. Proteins are synthesized from amino acids. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |

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| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Base:** | A substance that increases the $OH^-$ concentration of a solution; a proton acceptor. |
| **Boil:** | To change from a liquid to a vapor by the application of heat. |
| **Catalyst:** | A substance that speeds up or slows down the rate of a reaction without being consumed or altered. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Chemical change:** | A reaction or a change in a substance produced by chemical means that results in producing a different chemical. |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |
| **Concentration:** | The relative amount of a particular substance, a solute, or mixture. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductivity:** | The ability or power to conduct or transmit heat, electricity, or sound. |
| **Conservation of Mass:** | The principle that mass cannot be created or destroyed; also conservation of matter. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |
| **Dissolve:** | To cause to pass into solution. |
| **Diversity:** | The different species in a given area or specific period of time. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |

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| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Entropy:** | A measure of the unavailable energy in a closed thermodynamic system that is also usually considered to be a measure of the system's disorder, that is a property of the system's state, and that varies directly with any reversible change in heat in the system and inversely with the temperature of the system. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Enzyme:** | Any of numerous proteins produced in living cells that accelerate or catalyze chemical reactions. |
| **Evaporation:** | The process by which a liquid is converted to its vapor phase by heating the liquid. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |

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| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Melt:** | To be changed from a solid to a liquid state especially by the application of heat. |
| **Metal:** | Any of a category of electropositive elements that usually have a shiny surface, are generally good conductors of heat and electricity, and can be melted or fused, hammered into thin sheets, or drawn into wires. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Mole :** | The amount of a substance that contains as many atoms, molecules, ions, or other elementary units as the number of atoms in 0.012 |

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| | kilogram of carbon 12. The number is 6.0225 × 10^23, Avogadro's number. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Natural resource:** | Something, such as a forest, a mineral deposit, or fresh water, that is found in nature and is necessary or useful to humans. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |

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| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **van der Waals Force:** | A weak force of attraction between electrically neutral molecules that collide with or pass very close to each other. The van der Waals force is caused by the attraction between electron-rich regions of one molecule and electron-poor regions of another (the attraction between the molecules seen as electric dipoles). |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Volume:** | A measure of the amount of space an object takes up; also the loudness of a sound or signal. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Chemistry 1 for Credit Recovery- 2003345

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4367.aspx

## BASIC INFORMATION

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| **Course Title:** | Chemistry 1 for Credit Recovery |
| **Course Number:** | 2003345 |
| **Course Abbreviated Title:** | CHEM 1 CR |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Multiple (M) - Course length can vary |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding |

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| | of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:** *Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.*<br><br>Instructional Practices:<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (69)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science |

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| | or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and |

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| | establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |

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| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the |

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| | major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications** |

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| | i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and |

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| | exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |

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| MACC.912.S-ID.2.6: | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| SC.912.L.18.12: | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples |

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| | Annually assessed on Biology EOC. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.2.2: | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.2.4: | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often |

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| | examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br><br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural** |

phenomena (inferences),

9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a

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| | problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br><br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |

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| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |

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| SC.912.N.3.5: | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br><br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.N.4.1: | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br><br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.P.10.1: | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br><br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| SC.912.P.10.12: | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br><br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| SC.912.P.10.18: | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in |

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| | terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.10.7:** | Distinguish between endothermic and exothermic chemical processes.<br>Remarks/Examples<br>Classify chemical reactions and phase changes as exothermic (release thermal energy) or endothermic (absorb thermal energy). |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship  $E = h\nu$). |
| **SC.912.P.12.10:** | Interpret the behavior of ideal gases in terms of kinetic molecular theory.<br>Remarks/Examples |

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| | Using the kinetic molecular theory, explain the behavior of gases and the relationship between pressure and volume (Boyle's law), volume and temperature (Charles's law), pressure and temperature (Gay-Lussac's law), and number of particles in a gas sample (Avogadro's hypothesis). |
| **SC.912.P.12.11:** | Describe phase transitions in terms of kinetic molecular theory.<br>Remarks/Examples<br>Explain, at the molecular level, the behavior of matter as it undergoes phase transitions. |
| **SC.912.P.12.12:** | Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.<br>Remarks/Examples<br>Various factors could include: temperature, pressure, solvent and/or solute concentration, sterics, surface area, and catalysts. The rate of reaction is determined by the activation energy, and the pathway of the reaction can be shorter in the presence of enzymes or catalysts. Examples may include: decomposition of hydrogen peroxide using manganese (IV) oxide; nitration of benzene using concentrated sulfuric acid; hydrogenation of a C=C double bond using nickel. |
| **SC.912.P.12.13:** | Explain the concept of dynamic equilibrium in terms of reversible processes occurring at the same rates.<br>Remarks/Examples<br>Identify and explain the factors that affect the rate of dissolving (e.g., temperature, concentration, surface area, pressure, mixing). Explain that equilibrium is established when forward and reverse-reaction rates are equal. |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.11:** | Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.<br>Remarks/Examples<br>Use experimental data to illustrate and explain the pH scale to characterize acid and base solutions. Compare and contrast the |

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| | strengths of various common acids and bases. |
| **SC.912.P.8.2:** | Differentiate between physical and chemical properties and physical and chemical changes of matter.<br>Remarks/Examples<br>Discuss volume, compressibility, density, conductivity, malleability, reactivity, molecular composition, freezing, melting and boiling points. Describe simple laboratory techniques that can be used to separate homogeneous and heterogeneous mixtures (e.g. filtration, distillation, chromatography, evaporation). |
| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and "gold foil" experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.5:** | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br>Use the periodic table and electron configuration to determine an |

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| | element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell. |
| **SC.912.P.8.6:** | Distinguish between bonding forces holding compounds together and other attractive forces, including hydrogen bonding and van der Waals forces.<br>Remarks/Examples<br>Describe how atoms combine to form molecules through ionic, covalent, and hydrogen bonding. Compare and contrast the characteristics of the interactions between atoms in ionic and covalent compounds and how these bonds form. Use electronegativity to explain the difference between polar and nonpolar covalent bonds. |
| **SC.912.P.8.7:** | Interpret formula representations of molecules and compounds in terms of composition and structure.<br>Remarks/Examples<br>Write chemical formulas for simple covalent (HCl, SO2, CO2, and CH4), ionic (Na+ + Cl− → NaCl) and molecular (O2, H2O) compounds. Predict the formulas of ionic compounds based on the number of valence electrons and the charges on the ions. |
| **SC.912.P.8.8:** | Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.<br>Remarks/Examples<br>Classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement, and combustion. |
| **SC.912.P.8.9:** | Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions.<br>Remarks/Examples<br>Recognize one mole equals 6.02 x 10^23 particles (atoms or molecules). Determine number of particles for elements and compounds using the mole concept, in terms of number of particles, mass, and the volume of an ideal gas at specified conditions of temperature and pressure. Use experimental data to determine percent yield, empirical formulas, molecular formulas, |

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| | and calculate the mass-to-mass stoichiometry for a chemical reaction. |
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## RELATED GLOSSARY TERM DEFINITIONS (61)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Activation energy:** | The least amount of energy required to start a particular chemical reaction. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Base:** | A substance that increases the OH– concentration of a solution; a proton acceptor. |
| **Boil:** | To change from a liquid to a vapor by the application of heat. |
| **Catalyst:** | A substance that speeds up or slows down the rate of a reaction without being consumed or altered. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Chemical change:** | A reaction or a change in a substance produced by chemical means that results in producing a different chemical. |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |

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| **Concentration:** | The relative amount of a particular substance, a solute, or mixture. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductivity:** | The ability or power to conduct or transmit heat, electricity, or sound. |
| **Conservation of Mass:** | The principle that mass cannot be created or destroyed; also conservation of matter. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |
| **Dissolve:** | To cause to pass into solution. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Enzyme:** | Any of numerous proteins produced in living cells that accelerate or catalyze chemical reactions. |
| **Evaporation:** | The process by which a liquid is converted to its vapor phase by heating the liquid. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |

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| **Frequency:** | The number of cycles or waves per unit time. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Melt:** | To be changed from a solid to a liquid state especially by the application of heat. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Mole :** | The amount of a substance that contains as many atoms, molecules, ions, or other elementary units as the number of atoms in 0.012 kilogram of carbon 12. The number is 6.0225 × 10^23, Avogadro's |

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| | number. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |

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| **van der Waals Force:** | A weak force of attraction between electrically neutral molecules that collide with or pass very close to each other. The van der Waals force is caused by the attraction between electron-rich regions of one molecule and electron-poor regions of another (the attraction between the molecules seen as electric dipoles). |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Volume:** | A measure of the amount of space an object takes up; also the loudness of a sound or signal. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Chemistry 1- 2003340

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4360.aspx

## BASIC INFORMATION

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| **Course Title:** | Chemistry 1 |
| **Course Number:** | 2003340 |
| **Course Abbreviated Title:** | CHEM 1 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (69)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a |

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| | process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to |

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| | deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |

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| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and |

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| | techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root |

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| | functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and |

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| | $y=100^2$ |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and |

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| | describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.L.18.12:** | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br><br>Annually assessed on Biology EOC. |

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| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability. |

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| | Remarks/Examples<br><br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,** |

10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or

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| | technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br><br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome. |

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| | Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| [SC.912.N.2.5:]() | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| [SC.912.N.3.2:]() | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| [SC.912.N.3.3:]() | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| [SC.912.N.3.5:]() | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples |

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| | Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples |

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| | Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.10.7:** | Distinguish between endothermic and exothermic chemical processes.<br>Remarks/Examples<br>Classify chemical reactions and phase changes as exothermic (release thermal energy) or endothermic (absorb thermal energy). |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship  $E = hv$). |
| **SC.912.P.12.10:** | Interpret the behavior of ideal gases in terms of kinetic molecular theory.<br>Remarks/Examples<br>Using the kinetic molecular theory, explain the behavior of gases and the relationship between pressure and volume (Boyle's law), volume and temperature (Charles's law), pressure and temperature (Gay-Lussac's |

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| | law), and number of particles in a gas sample (Avogadro's hypothesis). |
| **SC.912.P.12.11:** | Describe phase transitions in terms of kinetic molecular theory.<br>Remarks/Examples<br>Explain, at the molecular level, the behavior of matter as it undergoes phase transitions. |
| **SC.912.P.12.12:** | Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.<br>Remarks/Examples<br>Various factors could include: temperature, pressure, solvent and/or solute concentration, sterics, surface area, and catalysts. The rate of reaction is determined by the activation energy, and the pathway of the reaction can be shorter in the presence of enzymes or catalysts. Examples may include: decomposition of hydrogen peroxide using manganese (IV) oxide; nitration of benzene using concentrated sulfuric acid; hydrogenation of a C=C double bond using nickel. |
| **SC.912.P.12.13:** | Explain the concept of dynamic equilibrium in terms of reversible processes occurring at the same rates.<br>Remarks/Examples<br>Identify and explain the factors that affect the rate of dissolving (e.g., temperature, concentration, surface area, pressure, mixing). Explain that equilibrium is established when forward and reverse-reaction rates are equal. |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.11:** | Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.<br>Remarks/Examples<br>Use experimental data to illustrate and explain the pH scale to characterize acid and base solutions. Compare and contrast the strengths of various common acids and bases. |

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| SC.912.P.8.2: | Differentiate between physical and chemical properties and physical and chemical changes of matter.<br>Remarks/Examples<br>Discuss volume, compressibility, density, conductivity, malleability, reactivity, molecular composition, freezing, melting and boiling points. Describe simple laboratory techniques that can be used to separate homogeneous and heterogeneous mixtures (e.g. filtration, distillation, chromatography, evaporation). |
| SC.912.P.8.3: | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and “gold foil” experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.P.8.4: | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.P.8.5: | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br>Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend |

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| | almost entirely on the configuration of the outer electron shell. |
| **SC.912.P.8.6:** | Distinguish between bonding forces holding compounds together and other attractive forces, including hydrogen bonding and van der Waals forces.<br>Remarks/Examples<br>Describe how atoms combine to form molecules through ionic, covalent, and hydrogen bonding. Compare and contrast the characteristics of the interactions between atoms in ionic and covalent compounds and how these bonds form. Use electronegativity to explain the difference between polar and nonpolar covalent bonds. |
| **SC.912.P.8.7:** | Interpret formula representations of molecules and compounds in terms of composition and structure.<br>Remarks/Examples<br>Write chemical formulas for simple covalent (HCl, SO2, CO2, and CH4), ionic (Na+ + Cl− → NaCl) and molecular (O2, H2O) compounds. Predict the formulas of ionic compounds based on the number of valence electrons and the charges on the ions. |
| **SC.912.P.8.8:** | Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.<br>Remarks/Examples<br>Classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement, and combustion. |
| **SC.912.P.8.9:** | Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions.<br>Remarks/Examples<br>Recognize one mole equals 6.02 x 10^23 particles (atoms or molecules). Determine number of particles for elements and compounds using the mole concept, in terms of number of particles, mass, and the volume of an ideal gas at specified conditions of temperature and pressure. Use experimental data to determine percent yield, empirical formulas, molecular formulas, and calculate the mass-to-mass stoichiometry for a chemical reaction. |

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## RELATED GLOSSARY TERM DEFINITIONS (61)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Activation energy:** | The least amount of energy required to start a particular chemical reaction. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Base:** | A substance that increases the OH– concentration of a solution; a proton acceptor. |
| **Boil:** | To change from a liquid to a vapor by the application of heat. |
| **Catalyst:** | A substance that speeds up or slows down the rate of a reaction without being consumed or altered. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Chemical change:** | A reaction or a change in a substance produced by chemical means that results in producing a different chemical. |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |
| **Concentration:** | The relative amount of a particular substance, a solute, or mixture. |

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| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductivity:** | The ability or power to conduct or transmit heat, electricity, or sound. |
| **Conservation of Mass:** | The principle that mass cannot be created or destroyed; also conservation of matter. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |
| **Dissolve:** | To cause to pass into solution. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Enzyme:** | Any of numerous proteins produced in living cells that accelerate or catalyze chemical reactions. |
| **Evaporation:** | The process by which a liquid is converted to its vapor phase by heating the liquid. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Frequency:** | The number of cycles or waves per unit time. |

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| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Melt:** | To be changed from a solid to a liquid state especially by the application of heat. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Mole :** | The amount of a substance that contains as many atoms, molecules, ions, or other elementary units as the number of atoms in 0.012 kilogram of carbon 12. The number is $6.0225 \times 10^{23}$, Avogadro's number. |

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| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **van der Waals Force:** | A weak force of attraction between electrically neutral molecules that collide with or pass very close to each other. The van der Waals |

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| | force is caused by the attraction between electron-rich regions of one molecule and electron-poor regions of another (the attraction between the molecules seen as electric dipoles). |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Volume:** | A measure of the amount of space an object takes up; also the loudness of a sound or signal. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Physical Science Honors- 2003320

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4344.aspx

## BASIC INFORMATION

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| **Course Title:** | Physical Science Honors |
| **Course Number:** | 2003320 |
| **Course Abbreviated Title:** | PHY SCI HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | While the content focus of this course is consistent with the Physical Science course, students will explore these concepts in greater depth. In general, the academic pace and rigor will be greatly increased for honors level course work. Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural |

phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).

**Special Notes:**

<u>Instructional Practices:</u> Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:

1. Ensuring wide reading from complex text that varies in length.
2. Making close reading and rereading of texts central to lessons.
3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.
4. Emphasizing students supporting answers based upon evidence from the text.
5. Providing extensive research and writing opportunities (claims and evidence).

**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)

- Asking questions (for science) and defining problems (for engineering).
- Developing and using models.
- Planning and carrying out investigations.
- Analyzing and interpreting data.
- Using mathematics, information and computer technology, and computational thinking.
- Constructing explanations (for science) and designing solutions (for engineering).
- Engaging in argument from evidence.
- Obtaining, evaluating, and communicating information.

## STANDARDS (93)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.910.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. |
| **LACC.910.RST.1.2:** | Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. |
| **LACC.910.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. |
| **LACC.910.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. |
| **LACC.910.RST.2.5:** | Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). |
| **LACC.910.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. |
| **LACC.910.RST.3.7:** | Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an |

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| | equation) into words. |
| **LACC.910.RST.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. |
| **LACC.910.RST.3.9:** | Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **LACC.910.RST.4.10:** | By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. |
| **MACC.912.A-CED.1.4:** | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*<br>Remarks/Examples<br>Algebra 1, Unit 1: Limit A.CED.4 to formulas which are linear in the variable of interest.<br><br>Algebra 1, Unit 4: Extend A.CED.4 to formulas involving squared variables. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |

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| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.* |

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| | a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while |

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| | attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative* |

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| | *maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes |

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| | when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-VM.1.1:** | Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, \|v\|, \|\|v\|\|, v). |
| **MACC.912.N-VM.1.3:** | Solve problems involving velocity and other quantities that can be |

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| | represented by vectors. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br>Remarks/Examples<br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model model fits by analyzing residuals.<br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course. |

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| | **Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples<br>Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.L.18.12:** | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.L.18.7:** | Identify the reactants, products, and basic functions of photosynthesis. |
| **SC.912.L.18.8:** | Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |

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| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br><br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),** |

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| | 9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and**<br>11. **Evaluate the merits of the explanations produced by others.**<br><br>Remarks/Examples |
| | Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science<br><br><u>For Students in Grades 9-10</u><br><br>LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or |

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| | technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation. |

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| | Remarks/Examples<br><br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br><br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br><br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br><br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and |

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| | the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |

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| SC.912.N.3.1: | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.3.2: | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.3.3: | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| SC.912.N.3.4: | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| SC.912.N.3.5: | Describe the function of models in science, and identify the wide |

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| | range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.N.4.1: | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.4.2: | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.P.10.1: | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential |

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| | energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.<br>Remarks/Examples<br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |

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| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and quantitatively. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |

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| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.10.7:** | Distinguish between endothermic and exothermic chemical processes.<br>Remarks/Examples<br>Classify chemical reactions and phase changes as exothermic (release thermal energy) or endothermic (absorb thermal energy). |
| **SC.912.P.12.1:** | Distinguish between scalar and vector quantities and assess which should be used to describe an event.<br>Remarks/Examples<br>Distinguish between vector quantities (e.g., displacement, velocity, acceleration, force, and linear momentum) and scalar quantities (e.g., distance, speed, energy, mass, work).<br><br>MACC.912.N-VM.1.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.10:** | Interpret the behavior of ideal gases in terms of kinetic molecular theory.<br>Remarks/Examples<br>Using the kinetic molecular theory, explain the behavior of gases and the relationship between pressure and volume (Boyle's law), volume and temperature (Charles's law), pressure and temperature (Gay-Lussac's law), and number of particles in a gas sample (Avogadro's hypothesis). |
| **SC.912.P.12.11:** | Describe phase transitions in terms of kinetic molecular theory.<br>Remarks/Examples<br>Explain, at the molecular level, the behavior of matter as it undergoes phase transitions. |
| **SC.912.P.12.12:** | Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction. |

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| | Remarks/Examples<br>Various factors could include: temperature, pressure, solvent and/or solute concentration, sterics, surface area, and catalysts. The rate of reaction is determined by the activation energy, and the pathway of the reaction can be shorter in the presence of enzymes or catalysts. Examples may include: decomposition of hydrogen peroxide using manganese (IV) oxide; nitration of benzene using concentrated sulfuric acid; hydrogenation of a C=C double bond using nickel. |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, F = ma). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F1 on 1 (Newton's third law). |
| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects. |

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| | Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.12.6:** | Qualitatively apply the concept of angular momentum.<br>Remarks/Examples<br>Explain that angular momentum is rotational analogy to linear momentum (e.g. Because angular momentum is conserved, a change in the distribution of mass about the axis of rotation will cause a change in the rotational speed [ice skater spinning]). |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.11:** | Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.<br>Remarks/Examples<br>Use experimental data to illustrate and explain the pH scale to characterize acid and base solutions. Compare and contrast the strengths of various common acids and bases. |
| **SC.912.P.8.2:** | Differentiate between physical and chemical properties and physical and chemical changes of matter.<br>Remarks/Examples<br>Discuss volume, compressibility, density, conductivity, malleability, reactivity, molecular composition, freezing, melting and boiling points. Describe simple laboratory techniques that can be used to separate homogeneous and heterogeneous mixtures (e.g. filtration, distillation, chromatography, evaporation). |

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| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br><br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and “gold foil” experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br><br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.5:** | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br><br>Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell. |
| **SC.912.P.8.7:** | Interpret formula representations of molecules and compounds in terms of composition and structure.<br>Remarks/Examples<br><br>Write chemical formulas for simple covalent (HCl, SO2, CO2, and CH4), ionic (Na+ + Cl− → NaCl) and molecular (O2, H2O) compounds. Predict the formulas of ionic compounds based on the |

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| | number of valence electrons and the charges on the ions. |
| SC.912.P.8.8: | Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.<br>Remarks/Examples<br>Classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement, and combustion. |

## RELATED GLOSSARY TERM DEFINITIONS (82)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |
| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Activation energy:** | The least amount of energy required to start a particular chemical reaction. |
| **Aerobic:** | Occurring in the presence of oxygen or requiring oxygen to live. In aerobic respiration, which is the process used by the cells of most organisms, the production of energy from glucose metabolism requires the presence of oxygen. |
| **Anaerobic :** | Occurring in the absence of oxygen or not requiring oxygen to live. Anaerobic bacteria produce energy from food molecules without the presence of oxygen. |
| **Angular momentum:** | A vector quantity that is a measure of the rotational momentum of a rotating body or system, that is equal in classical physics to the product of the angular velocity of the body or system and its moment of inertia with respect to the rotation axis, and that is directed along |

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| | the rotation axis. |
| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Axis:** | The imaginary line on which an object rotates (e.g., Earth's axis runs through Earth between the North Pole and the South Pole); an imaginary straight line that runs through a body; a reference to the line in a coordinate system or graph. |
| **Base:** | A substance that increases the $OH^-$ concentration of a solution; a proton acceptor. |
| **Boil:** | To change from a liquid to a vapor by the application of heat. |
| **Catalyst:** | A substance that speeds up or slows down the rate of a reaction without being consumed or altered. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Chemical change:** | A reaction or a change in a substance produced by chemical means that results in producing a different chemical. |
| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |
| **Concentration:** | The relative amount of a particular substance, a solute, or mixture. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductivity:** | The ability or power to conduct or transmit heat, electricity, or sound. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |

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| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Enzyme:** | Any of numerous proteins produced in living cells that accelerate or catalyze chemical reactions. |
| **Evaporation:** | The process by which a liquid is converted to its vapor phase by heating the liquid. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |

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| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Melt:** | To be changed from a solid to a liquid state especially by the application of heat. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |

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| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Photosynthesis:** | A chemical process by which plants use light energy to convert carbon dioxide and water into carbohydrates (sugars). |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |

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| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Volume:** | A measure of the amount of space an object takes up; also the loudness of a sound or signal. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a |

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| | gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Physical Science- 2003310

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4273.aspx

## BASIC INFORMATION

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| **Course Title:** | Physical Science |
| **Course Number:** | 2003310 |
| **Course Abbreviated Title:** | PHY SCI |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>Instructional Practices: Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (74)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.910.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. |
| **LACC.910.RST.1.2:** | Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. |
| **LACC.910.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. |
| **LACC.910.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. |
| **LACC.910.RST.2.5:** | Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). |
| **LACC.910.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. |
| **LACC.910.RST.3.7:** | Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. |
| **LACC.910.RST.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. |
| **LACC.910.RST.3.9:** | Compare and contrast findings presented in a text to those from |

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| | other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **LACC.910.RST.4.10:** | By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |

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| **LACC.910.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. |

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| | d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |

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| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples<br>Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.L.18.12:** | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.L.18.7:** | Identify the reactants, products, and basic functions of photosynthesis. |
| **SC.912.L.18.8:** | Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration. |

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| SC.912.N.1.5: | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.2.1: | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| SC.912.N.2.2: | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, |

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| | philosophy, and religion.<br>Remarks/Examples<br><br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural** |

phenomena (inferences),
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or

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| | technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation. |

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| | Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's |

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| | experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying |

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| | explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of |

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| | transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, |

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| | frequency, and energy. |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and quantitatively. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.10.7:** | Distinguish between endothermic and exothermic chemical processes.<br>Remarks/Examples<br>Classify chemical reactions and phase changes as exothermic (release thermal energy) or endothermic (absorb thermal energy). |
| **SC.912.P.12.10:** | Interpret the behavior of ideal gases in terms of kinetic molecular theory.<br>Remarks/Examples<br>Using the kinetic molecular theory, explain the behavior of gases and the relationship between pressure and volume (Boyle's law), volume and temperature (Charles's law), pressure and temperature (Gay-Lussac's law), and number of particles in a gas sample (Avogadro's hypothesis). |
| **SC.912.P.12.11:** | Describe phase transitions in terms of kinetic molecular theory.<br>Remarks/Examples<br>Explain, at the molecular level, the behavior of matter as it undergoes phase transitions. |

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| **SC.912.P.12.12:** | Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.<br>Remarks/Examples<br>Various factors could include: temperature, pressure, solvent and/or solute concentration, sterics, surface area, and catalysts. The rate of reaction is determined by the activation energy, and the pathway of the reaction can be shorter in the presence of enzymes or catalysts. Examples may include: decomposition of hydrogen peroxide using manganese (IV) oxide; nitration of benzene using concentrated sulfuric acid; hydrogenation of a C=C double bond using nickel. |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, F = ma). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F1 on 1 (Newton's third law). |
| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |

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| SC.912.P.12.7: | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| SC.912.P.8.1: | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| SC.912.P.8.11: | Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.<br>Remarks/Examples<br>Use experimental data to illustrate and explain the pH scale to characterize acid and base solutions. Compare and contrast the strengths of various common acids and bases. |
| SC.912.P.8.2: | Differentiate between physical and chemical properties and physical and chemical changes of matter.<br>Remarks/Examples<br>Discuss volume, compressibility, density, conductivity, malleability, reactivity, molecular composition, freezing, melting and boiling points. Describe simple laboratory techniques that can be used to separate homogeneous and heterogeneous mixtures (e.g. filtration, distillation, chromatography, evaporation). |
| SC.912.P.8.4: | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion |

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| | consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.5:** | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br>Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell. |
| **SC.912.P.8.7:** | Interpret formula representations of molecules and compounds in terms of composition and structure.<br>Remarks/Examples<br>Write chemical formulas for simple covalent (HCl, SO2, CO2, and CH4), ionic (Na+ + Cl− → NaCl) and molecular (O2, H2O) compounds. Predict the formulas of ionic compounds based on the number of valence electrons and the charges on the ions. |
| **SC.912.P.8.8:** | Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.<br>Remarks/Examples<br>Classify chemical reactions as synthesis (combination), decomposition, single displacement (replacement), double displacement, and combustion. |

## RELATED GLOSSARY TERM DEFINITIONS (75)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Activation energy:** | The least amount of energy required to start a particular chemical reaction. |
| **Aerobic:** | Occurring in the presence of oxygen or requiring oxygen to live. In aerobic respiration, which is the process used by the cells of most organisms, the production of energy from glucose metabolism requires the presence of oxygen. |
| **Anaerobic :** | Occurring in the absence of oxygen or not requiring oxygen to live. Anaerobic bacteria produce energy from food molecules without the presence of oxygen. |
| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Base:** | A substance that increases the OH– concentration of a solution; a proton acceptor. |
| **Boil:** | To change from a liquid to a vapor by the application of heat. |
| **Catalyst:** | A substance that speeds up or slows down the rate of a reaction without being consumed or altered. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Chemical change:** | A reaction or a change in a substance produced by chemical means that results in producing a different chemical. |
| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |

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| **Concentration:** | The relative amount of a particular substance, a solute, or mixture. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductivity:** | The ability or power to conduct or transmit heat, electricity, or sound. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of $9.107 \times 10^{-28}$ grams and an electric charge of approximately $-1.602 \times 10^{-19}$ coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Enzyme:** | Any of numerous proteins produced in living cells that accelerate or catalyze chemical reactions. |
| **Evaporation:** | The process by which a liquid is converted to its vapor phase by heating the liquid. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |

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| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Melt:** | To be changed from a solid to a liquid state especially by the application of heat. |

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| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Photosynthesis:** | A chemical process by which plants use light energy to convert carbon dioxide and water into carbohydrates (sugars). |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |

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| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Volume:** | A measure of the amount of space an object takes up; also the loudness of a sound or signal. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Solar Energy 2 Honors- 2002550

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4937.aspx

## BASIC INFORMATION

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| **Course Title:** | Solar Energy 2 Honors |
| **Course Number:** | 2002550 |
| **Course Abbreviated Title:** | SOLAR ENERGY 2 HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Integrated Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Elective |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **Version Description:** | This course is designed to educate students more specifically on the generation of heat from solar energy. Building on concepts from Solar Energy Honors, this course will focus largely on fluid mechanics and heat transfer in solar thermal systems (pool, space, and water heating), especially types of collectors, properties of suitable materials for collectors, open and closed loop systems, and types of heat storage. The course covers scientifics, economic, and global impact analysis of current energy methods and new solar energy technologies for the generation of energy from heat, as well as careers in various areas of solar energy. Students will be guided through the process of certification for a solar energy technician. |

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| | **Special Notes:**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (67)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

**Career and Technical Education: Solar Energy Technician**

19.01 Define basic solar terms (e.g., irradiation, Langley, azimuth)
19.05 Describe angular effects on the irradiance of array

19.06 Identify factors that reduce/enhance solar irradiation
19.07 Determine average solar irradiation on various surfaces
19.08 Describe how a photovoltaic solar cell works
19.09 Draw and label a diagram of PV cells
19.10 Explain the differences between monocrystalline, polycrystalline, thin-film, and nano-solar cells
20.02 Identify personal and environmental safety hazards and accetable practices
21.08 Estimate the peak load and average energy use in order to determine the size and amount of solar equipment needed
22.05 Select appropriate conductor types and rating for each electrical circuit in the open or closed system
22.09 Determine voltage drop for any electrical circuit based on size and length of conductors
29.01 Discuss the role of creativity in constructing scientific questions, methods, and explanations.
29.02 Formulate scientifically investigatable questions, construct investigations, college and evaluate data, and develop scientific recommendations based on findings.
31.04 Conduct technical research to gather information necessary for decision-making

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating |

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| | or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, |

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| | word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.910.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. |

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| | c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |

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| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. |
| **LACC.910.RST.2.5:** | Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). |
| **LACC.910.RST.4.10:** | By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the |

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| | expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships |

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| | between them provides grounding for work with expressions, equations, and functions. |
| **SC.912.E.5.4:** | Explain the physical properties of the Sun and its dynamic nature and connect them to conditions and events on Earth.<br>Remarks/Examples<br>Describe the physical properties of the Sun (sunspot cycles, solar flares, prominences, layers of the Sun, coronal mass ejections, and nuclear reactions) and the impact of the Sun as the main source of external energy for the Earth. |
| **SC.912.E.6.6:** | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.<br>Remarks/Examples<br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples<br>Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.L.17.11:** | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| **SC.912.L.17.13:** | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| **SC.912.L.17.15:** | Discuss the effects of technology on environmental quality. |

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| SC.912.L.17.16: | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| SC.912.L.17.17: | Assess the effectiveness of innovative methods of protecting the environment. |
| SC.912.L.17.18: | Describe how human population size and resource use relate to environmental quality. |
| SC.912.L.17.20: | Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.17.11, SC.912.L.17.13, SC.912.N.1.3. |
| SC.912.N.1.5: | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.1: | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the |

purpose of the investigation and identify the relevant scientific concepts).

2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).
3. **Examine books and other sources of information to see what is already known,**
4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. **Plan investigations,** (Design and evaluate a scientific investigation).
6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure

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| | when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated |

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| | reasoning. |
| SC.912.N.1.2: | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.1.3: | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| SC.912.N.1.4: | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples |

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| | Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |

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| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |

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| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br><br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br><br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br><br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br><br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in |

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| | battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and quantitatively. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.10.8:** | Explain entropy's role in determining the efficiency of processes that convert energy to work.<br>Remarks/Examples<br>Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness (entropy). Describe entropy as a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system. |

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| **SC.912.P.8.12:** | Describe the properties of the carbon atom that make the diversity of carbon compounds possible.<br>Remarks/Examples<br>Explain how the bonding characteristics of carbon lead to a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules. |
| **SS.912.W.9.1:** | Identify major scientific figures and breakthroughs of the 20th century, and assess their impact on contemporary life.<br>Remarks/Examples<br>Examples are Marie Curie, Albert Einstein, Enrico Fermi, Sigmund Freud, Wright Brothers, Charles R. Drew, mass vaccination, atomic energy, transistor, microchip, space exploration, Internet, discovery of DNA, Human Genome Project. |

## RELATED GLOSSARY TERM DEFINITIONS (45)

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| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |

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| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Diversity:** | The different species in a given area or specific period of time. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of $9.107 \times 10^{-28}$ grams and an electric charge of approximately $-1.602 \times 10^{-19}$ coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Entropy:** | A measure of the unavailable energy in a closed thermodynamic system that is also usually considered to be a measure of the system's disorder, that is a property of the system's state, and that varies directly with any reversible change in heat in the system and inversely with the temperature of the system. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |

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| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Observation :** | What one has observed using senses or instruments. |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities. |

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| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |

# Course: Solar Energy Honors- 2002540

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4373.aspx

## BASIC INFORMATION

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| **Course Title:** | Solar Energy Honors |
| **Course Number:** | 2002540 |
| **Course Abbreviated Title:** | SOLAR ENERGY HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Integrated Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Elective |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding |

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| | of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>**Instructional Practices** Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (70)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and |

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| | technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of |

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| | the distribution or the existence of extreme data points. |
| **SC.912.L.17.16:** | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| **SC.912.L.17.17:** | Assess the effectiveness of innovative methods of protecting the environment. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the |

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| | credibility and accuracy of each source and noting any discrepancies among the data. |
| [LACC.1112.SL.1.3:] | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| [LACC.1112.SL.2.4:] | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| [LACC.1112.SL.2.5:] | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| [LACC.1112.WHST.3.8:] | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| [LACC.1112.WHST.3.9:] | Draw evidence from informational texts to support analysis, reflection, and research. |
| [LACC.1112.WHST.4.10:] | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| [SC.912.L.17.15:] | Discuss the effects of technology on environmental quality. |
| [LACC.1112.WHST.1.1:] | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both |

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| | claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, |

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| | organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications** |

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| | i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples |

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| | Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals. |

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| | c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.5.4:** | Explain the physical properties of the Sun and its dynamic nature and connect them to conditions and events on Earth.<br>Remarks/Examples<br><br>Describe the physical properties of the Sun (sunspot cycles, solar flares, prominences, layers of the Sun, coronal mass ejections, and nuclear reactions) and the impact of the Sun as the main source of external energy for the Earth. |
| **SC.912.E.6.6:** | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.<br>Remarks/Examples<br><br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore |

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| | drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples<br>Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.E.7.2:** | Analyze the causes of the various kinds of surface and deep water motion within the oceans and their impacts on the transfer of energy between the poles and the equator.<br>Remarks/Examples<br>Explain how surface and deep-water circulation patterns (Coriolis effect, La Niña, El Niño, Southern Oscillation, upwelling, ocean surface cooling, freshwater influx, density differences, Labrador Current and Gulf Stream) impact energy transfer in the environment. |
| **SC.912.E.7.9:** | Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.<br>Remarks/Examples<br>Explain how the oceans act as sources/sinks of heat energy, store carbon dioxide mostly as dissolved HCO3– and CaCO3 as precipitate or biogenic carbonate deposits, which have an impact on climate change. |
| **SC.912.L.17.11:** | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| **SC.912.L.17.12:** | Discuss the political, social, and environmental consequences of sustainable use of land.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health |

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| | are interrelated. |
| **SC.912.L.17.13:** | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| **SC.912.L.17.18:** | Describe how human population size and resource use relate to environmental quality. |
| **SC.912.L.17.19:** | Describe how different natural resources are produced and how their rates of use and renewal limit availability. |
| **SC.912.L.17.20:** | Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.17.11, SC.912.L.17.13, SC.912.N.1.3. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., |

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| | scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and**<br>11. **Evaluate the merits of the explanations produced by others.**<br><br>Remarks/Examples |
| | Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science<br><br><u>For Students in Grades 9-10</u><br><br>LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing |

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| | technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent |

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| | results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving). |

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| | CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific |

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| | argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples |

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| | Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.N.4.1: | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br><br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.4.2: | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br><br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.P.10.1: | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br><br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the |

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| | ground. |
| SC.912.P.10.2: | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| SC.912.P.10.3: | Compare and contrast work and power qualitatively and quantitatively. |
| SC.912.P.10.4: | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| SC.912.P.10.9: | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship $E = hv$). |
| SC.912.P.8.12: | Describe the properties of the carbon atom that make the diversity of carbon compounds possible.<br>Remarks/Examples<br>Explain how the bonding characteristics of carbon lead to a large variety of structures ranging from simple hydrocarbons to complex polymers and biological molecules. |
| SC.912.P.8.13: | Identify selected functional groups and relate how they contribute to properties of carbon compounds.<br>Remarks/Examples<br>Recognize functional groups in structural formulas of carbon molecules (e.g. sugars, proteins, nucleotides, amino acids, hydroxyl groups which form alcohols, carbonyl groups which form |

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| | aldehydes / ketones, carboxyl groups which form carboxylic acids, etc.). |
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## RELATED GLOSSARY TERM DEFINITIONS (48)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Amino acid:** | An organic molecule containing an amino group (-NH2), a carboxyl (-COOH) group, and a variable side chain (R group) that distinguishes the amino acid. Proteins are synthesized from amino acids. |
| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Compound:** | A substance made up of at least two different elements held together by chemical bonds that can only be broken down into elements by chemical processes. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |

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| **Diversity:** | The different species in a given area or specific period of time. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Equator :** | An imaginary circle around Earth's surface located between the poles and a plane perpendicular to its axis of rotation that divides it into the Northern and Southern Hemispheres. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among |

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| | phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Natural resource:** | Something, such as a forest, a mineral deposit, or fresh water, that is found in nature and is necessary or useful to humans. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Observation :** | What one has observed using senses or instruments. |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Pole:** | Either of the points at which the Earth's axis of rotation intersects the Earth's surface; the North Pole or South Pole. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities. |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Radiation:** | Emission of energy in the form of rays or waves. |

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| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |

# Course: Astronomy Solar/Galactic Honors-2020910

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4252.aspx

## BASIC INFORMATION

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| **Course Title:** | Astronomy Solar/Galactic Honors |
| **Course Number:** | 2020910 |
| **Course Abbreviated Title:** | ASTR S/G HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Earth/Space Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | While the content focus of this course is consistent with the Astronomy Solar/Galactic course, students will explore these concepts in greater depth. In general, the academic pace and rigor will be greatly increased for honors level course work. Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to |

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| | interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>Instructional Practices Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (80)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |

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| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions |

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| | and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, |

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| | reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples |

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| | appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions. |

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| | **Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. |

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| | Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. |

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| | Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |

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| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.5.10:** | Describe and apply the coordinate system used to locate objects in the sky.<br>Remarks/Examples<br><br>Discuss how scientists determine the location of constellations, celestial spheres, and sky maps. Compare and contrast the celestial celestial coordinate system (equatorial system) to the use of latitude and longitude to specify locations on Earth. Recognize the |

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| | use of right ascension and declination in the location of objects in space, including stars and constellations. |
| **SC.912.E.5.11:** | Distinguish the various methods of measuring astronomical distances and apply each in appropriate situations.<br>Remarks/Examples<br>Determine which units of measurement are appropriate to describe distance (e.g. astronomical units, parallax, and light years).<br><br>CCSS Connections: MACC.K12.MP.5: Use appropriate tools strategically; and MACC.K12.MP.6: Attend to precision. |
| **SC.912.E.5.7:** | Relate the history of and explain the justification for future space exploration and continuing technology development.<br>Remarks/Examples<br>Identify examples of historical space exploration (e.g. telescopes, high altitude balloons, lunar landers, deep-space probes, space station) that had significant impact on current space exploration and recognize the importance of continued exploration in space. |
| **SC.912.E.5.8:** | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used to detect and interpret information from electromagnetic radiation sources. |
| **SC.912.E.5.9:** | Analyze the broad effects of space exploration on the economy and culture of Florida.<br>Remarks/Examples<br>Recognize the economic, technical and social benefits of spinoff technology developed through the space program. |
| **SC.912.E.6.2:** | Connect surface features to surface processes that are responsible for their formation. |

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| | Remarks/Examples<br>Identify various landforms (e.g. dunes, lakes, sinkholes, aquifers) and describe how they form (erosion, physical/chemical weathering, and deposition). Explain how sea level changes over time have exposed and inundated continental shelves, created and destroyed inland seas, and shaped the surface of the Earth. |
| **SC.912.E.7.7:** | Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change.<br>Remarks/Examples<br>Explain the possible natural (e.g. increased global temperature, wildfires, volcanic dust) and anthropogenic mechanisms (e.g. air pollution, acid rain, greenhouse gases, burning of fossil fuels) and the effects of these mechanisms on global climate change. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) |

including set-up, calibration, technique, maintenance, and storage).

7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the

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| | text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions. |

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| | CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving). |

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| | CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific |

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| | knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and |

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| | discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |

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| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.<br>Remarks/Examples<br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples |

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| | Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.19:** | Explain that all objects emit and absorb electromagnetic radiation and distinguish between objects that are blackbody radiators and those that are not. |
| **SC.912.P.10.20:** | Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.<br>Remarks/Examples<br>Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.22:** | Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.<br>Remarks/Examples<br>Use examples such as converging/diverging lenses and convex/concave mirrors. Use a ray diagram to determine the approximate location and size of the image, and the mirror equation to obtain numerical information about image distance and image size. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level. |

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| | Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship $E = hv$). |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, $F = ma$). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: $F_{1 \text{ on } 2} = -F_{1 \text{ on } 1}$ (Newton's third law). |
| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |
| **SC.912.P.12.6:** | Qualitatively apply the concept of angular momentum.<br>Remarks/Examples |

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| | Explain that angular momentum is rotational analogy to linear momentum (e.g. Because angular momentum is conserved, a change in the distribution of mass about the axis of rotation will cause a change in the rotational speed [ice skater spinning]). |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.12.8:** | Recognize that Newton's Laws are a limiting case of Einstein's Special Theory of Relativity at speeds that are much smaller than the speed of light.<br>Remarks/Examples<br>Recognize that the speed of light in any reference frame is the central postulate of the Special Theory of Relativity. As speeds approach zero, Special Relativity tends towards equivalence with Newton's Laws of Motion. |
| **SC.912.P.12.9:** | Recognize that time, length, and energy depend on the frame of reference.<br>Remarks/Examples<br>The energy *E* and the momentum *p* depend on the frame of reference in which they are measured (e.g. Lorentz contraction). |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom |

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| | and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

## RELATED GLOSSARY TERM DEFINITIONS (58)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |
| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Angular momentum:** | A vector quantity that is a measure of the rotational momentum of a rotating body or system, that is equal in classical physics to the product of the angular velocity of the body or system and its moment of inertia with respect to the rotation axis, and that is directed along the rotation axis. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Axis:** | The imaginary line on which an object rotates (e.g., Earth's axis runs through Earth between the North Pole and the South Pole); an imaginary straight line that runs through a body; a reference to the line in a coordinate system or graph. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one |

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| | region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Deposition:** | The process by which sediment is carried by forces (e.g., wind, rain, or water currents) and left in a certain area. |
| **Dune:** | A hill or ridge of sand piled up by the wind. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Erosion:** | The wearing away of Earth's surface by the breakdown and transportation of rock and soil. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |

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| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Latitude:** | A measure of relative position north or south on the Earth's surface, measured in degrees from the equator, which has a latitude of 0°, with the poles having a latitude of 90° north and south. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects |

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| | too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Relativity (special theory of):** | The physical theory of space and time developed by Albert Einstein, based on the postulates that all the laws of physics are equally valid in all frames of reference moving at a uniform velocity and that the speed of light from a uniformly moving source is always the same, regardless of how fast or slow the source or its observer is moving. The theory has as consequences the relativistic mass increase of rapidly moving objects, the Lorentz-Fitzgerald contraction, time dilatation, and the principle of mass-energy equivalence. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |

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| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Vibration:** | A periodic and repetitive movement around an equilibrium point. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Nuclear Radiation Honors- 2020710

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4259.aspx

## BASIC INFORMATION

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| **Course Title:** | Nuclear Radiation Honors |
| **Course Number:** | 2020710 |
| **Course Abbreviated Title:** | NUCLEAR RADI HON |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | While the content focus of this course is consistent with the Nuclear Radiation course, students will explore these concepts in greater depth. In general, the academic pace and rigor will be greatly increased for honors level course work. Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural |

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| | phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence. |

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| | • Obtaining, evaluating, and communicating information. |

## STANDARDS (85)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |

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| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to |

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| | make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form |

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| | that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and |

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| | audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context |

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| | ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. |

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| | Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |

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| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications** |

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| | i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.5.1:** | Cite evidence used to develop and verify the scientific theory of the Big Bang (also known as the Big Bang Theory) of the origin of the universe.<br>Remarks/Examples<br>Explain evidence to support the formation of the universe, which has been expanding for approximately 15 billion year (e.g. ratio of gases, red-shift from distant galaxies, and cosmic background radiation). |
| **SC.912.E.5.2:** | Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.<br>Remarks/Examples<br>Identify patterns that influence the formation, heirarchy, and motions of the various kinds of objects in the solar system and the role of gravity and inertia on these motions (include the Sun, Earth, and Moon, planets, satellites, comets, asteroids, star clusters, galaxies, galaxy clusters). Recognize that the universe contains many billions of galaxies, and each galaxy contains many billions of stars. Recognize that constellations are contrived associations of stars that do not reflect functional relationships in space.<br><br>CCSS Connections: MACC.K12.MP.7: Look for and make use of structure. |
| **SC.912.E.5.3:** | Describe and predict how the initial mass of a star determines its evolution.<br>Remarks/Examples<br>Compare and contrast the evolution of stars of different masses (include the three outcomes of stellar evolution based on mass: black hole, neutron star, white dwarf). Differentiate between the different types of stars found on the Hertzsprung-Russell diagram and the balance between gravitational collapse and nuclear fusion in determining the color, brightness, and life span of a star. |
| **SC.912.E.5.4:** | Explain the physical properties of the Sun and its dynamic nature |

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| | and connect them to conditions and events on Earth.<br>Remarks/Examples<br>Describe the physical properties of the Sun (sunspot cycles, solar flares, prominences, layers of the Sun, coronal mass ejections, and nuclear reactions) and the impact of the Sun as the main source of external energy for the Earth. |
| **SC.912.E.5.7:** | Relate the history of and explain the justification for future space exploration and continuing technology development.<br>Remarks/Examples<br>Identify examples of historical space exploration (e.g. telescopes, high altitude balloons, lunar landers, deep-space probes, space station) that had significant impact on current space exploration and recognize the importance of continued exploration in space. |
| **SC.912.E.5.8:** | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used to detect and interpret information from electromagnetic radiation sources. |
| **SC.912.E.6.6:** | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.<br>Remarks/Examples<br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples<br>Describe that the Earth system contains fixed amounts of each |

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| | stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.L.14.6:** | Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. |
| **SC.912.L.15.2:** | Discuss the use of molecular clocks to estimate how long ago various groups of organisms diverged evolutionarily from one another. |
| **SC.912.L.16.10:** | Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.L.17.13:** | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| **SC.912.L.17.14:** | Assess the need for adequate waste management strategies. |
| **SC.912.L.17.15:** | Discuss the effects of technology on environmental quality. |
| **SC.912.L.17.16:** | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| **SC.912.L.17.17:** | Assess the effectiveness of innovative methods of protecting the environment. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific |

concepts).

2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).
3. **Examine books and other sources of information to see what is already known,**
4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. **Plan investigations,** (Design and evaluate a scientific investigation).
6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

<u>For Students in Grades 9-10</u>

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

Common Core State Standards (CCSS) Connections for Mathematical Practices

MACC.K12.MP.1: Make sense of problems and persevere in solving them.
MACC.K12.MP.2: Reason abstractly and quantitatively.
MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]
MACC.K12.MP.4: Model with mathematics.
MACC.K12.MP.5: Use appropriate tools strategically.
MACC.K12.MP.6: Attend to precision.
MACC.K12.MP.7: Look for and make use of structure.
MACC.K12.MP.8: Look for and express regularity in repeated reasoning.

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| SC.912.N.1.2: | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| SC.912.N.1.3: | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| SC.912.N.1.4: | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| SC.912.N.1.5: | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have |

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| | been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, |

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| | belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative |

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| | and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |

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| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |

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| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.<br>Remarks/Examples<br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.16:** | Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.<br>Remarks/Examples<br>Explain that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy |

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| | in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy.  Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.8:** | Explain entropy's role in determining the efficiency of processes that convert energy to work.<br>Remarks/Examples<br>Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness (entropy). Describe entropy as a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system. |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship  $E = hv$). |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.12.9:** | Recognize that time, length, and energy depend on the frame of reference.<br>Remarks/Examples |

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| | The energy *E* and the momentum *p* depend on the frame of reference in which they are measured (e.g. Lorentz contraction). |
| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and “gold foil” experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.5:** | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br>Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell. |

## RELATED GLOSSARY TERM DEFINITIONS (62)

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| **Asteroid:** | A rocky or metallic object that orbits the Sun and is much smaller than a planet. |
| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Big Bang Theory:** | A cosmological theory holding that the universe originated approximately 20 billion years ago from the violent explosion of a very small agglomeration of matter of extremely high density and temperature. |
| **Biotechnology:** | The manipulation (as through genetic engineering) of living organisms or their components to produce useful usually commercial products (as pest resistant crops, new bacterial strains, or novel pharmaceuticals). |
| **Comet:** | A celestial body that appears as a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, that consists primarily of ice and dust, and that often develops one or more long tails when near the sun. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |

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| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Entropy:** | A measure of the unavailable energy in a closed thermodynamic system that is also usually considered to be a measure of the system's disorder, that is a property of the system's state, and that varies directly with any reversible change in heat in the system and inversely with the temperature of the system. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Evolution :** | A theory that the various types of species arise from pre-existing species and that distinguishable characteristics are due to modifications through successive generations. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Galaxy:** | A large collection of stars, gases, and dust that are part of the universe (e.g., the Milky Way galaxy) bound together by gravitational forces. |

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| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Genetic:** | Affecting or determined by genes. |
| **Gravity:** | The force of attraction between any two objects. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Magnet:** | An object that produces a magnetic field and that has the property, either natural or induced, of attracting iron or steel. |
| **Magnetic:** | Having the property of attracting iron and certain other materials by virtue of a field of force. |
| **Magnetic field:** | The region where magnetic force exists around magnets or electric currents. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Momentum:** | A vector quantity that is the product of an object’s mass and velocity. |
| **Moon:** | A natural satellite that revolves around a planet. |

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| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately |

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| | 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Principles of Technology 2- 2003610

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4287.aspx

## BASIC INFORMATION

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| **Course Title:** | Principles of Technology 2 |
| **Course Number:** | 2003610 |
| **Course Abbreviated Title:** | PRINC TECH 2 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (68)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.910.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. |
| **LACC.910.RST.1.2:** | Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. |
| **LACC.910.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. |
| **LACC.910.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. |
| **LACC.910.RST.2.5:** | Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). |
| **LACC.910.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. |
| **LACC.910.RST.3.7:** | Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. |
| **LACC.910.RST.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. |
| **LACC.910.RST.3.9:** | Compare and contrast findings presented in a text to those from |

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| | other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **LACC.910.RST.4.10:** | By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **SC.912.E.5.7:** | Relate the history of and explain the justification for future space exploration and continuing technology development.<br>Remarks/Examples<br>Identify examples of historical space exploration (e.g. telescopes, high altitude balloons, lunar landers, deep-space probes, space station) that had significant impact on current space exploration and recognize the importance of continued exploration in space. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the |

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| | topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline- |

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| | appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| LACC.910.WHST.1.2: | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| LACC.910.WHST.2.4: | Produce clear and coherent writing in which the development, |

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| | organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SC.912.E.5.8:** | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used to detect and interpret information from electromagnetic radiation sources. |
| **SC.912.E.5.9:** | Analyze the broad effects of space exploration on the economy and culture of Florida.<br>Remarks/Examples<br>Recognize the economic, technical and social benefits of spinoff |

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| | technology developed through the space program. |
| SC.912.E.6.6: | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.<br>Remarks/Examples<br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| SC.912.L.17.11: | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| SC.912.L.17.15: | Discuss the effects of technology on environmental quality. |
| SC.912.N.1.5: | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.7: | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving). |

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| | CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: |

1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).
2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).
3. **Examine books and other sources of information to see what is already known,**
4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. **Plan investigations,** (Design and evaluate a scientific investigation).
6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

<u>For Students in Grades 11-12</u>

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

Common Core State Standards (CCSS) Connections for Mathematical Practices

MACC.K12.MP.1: Make sense of problems and persevere in solving them.
MACC.K12.MP.2: Reason abstractly and quantitatively.
MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]
MACC.K12.MP.4: Model with mathematics.
MACC.K12.MP.5: Use appropriate tools strategically.
MACC.K12.MP.6: Attend to precision.
MACC.K12.MP.7: Look for and make use of structure.
MACC.K12.MP.8: Look for and express regularity in repeated reasoning.

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| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br><br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br><br>Recognize that ideas with the most durable explanatory power |

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| | become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events. |

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| | CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific |

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| | societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.13:** | Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.<br>Remarks/Examples<br>Using Coulomb's law, determine the force on a stationary charge due to other stationary charges, and explain that this force is many times greater than the gravitational force. Recognize the relationship between forces and their associated potential energies and that the electric field is directly related to the rate of change of the electric potential from point to point in space. |

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| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br><br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |
| **SC.912.P.10.16:** | Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.<br>Remarks/Examples<br><br>Explain that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers. |
| **SC.912.P.10.17:** | Explore the theory of electromagnetism by explaining electromagnetic waves in terms of oscillating electric and magnetic fields.<br>Remarks/Examples<br><br>Recognize that an oscillating charge creates an oscillating electric field which gives rise to electromagnetic waves. Recognize a changing magnetic field makes an electric field, and a changing electric field makes a magnetic field, and these phenomena are expressed mathematically through the Faraday law and the Ampere-Maxwell law. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br><br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br><br>Use calorimetry to illustrate conservation of energy. Differentiate between |

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| | the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.20:** | Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.<br>Remarks/Examples<br>Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.22:** | Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.<br>Remarks/Examples<br>Use examples such as converging/diverging lenses and convex/concave mirrors. Use a ray diagram to determine the approximate location and size of the image, and the mirror equation to obtain numerical information about image distance and image size. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |

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| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.12.7:** | Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.<br>Remarks/Examples<br>Recognize that regardless of the speed of an observer or source, *in a vacuum* the speed of light is always *c*. |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

## RELATED GLOSSARY TERM DEFINITIONS (60)

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| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electric potential:** | A measure of the work required by an electric field to move electric charges. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |

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| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Magnet:** | An object that produces a magnetic field and that has the property, |

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| | either natural or induced, of attracting iron or steel. |
| **Magnetic:** | Having the property of attracting iron and certain other materials by virtue of a field of force. |
| **Magnetic field:** | The region where magnetic force exists around magnets or electric currents. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Potential energy:** | Energy stored in a physical system due to the object’s configuration and position. |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Proton:** | A subatomic particle having a positive charge and which is found in |

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| | the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Vacuum:** | A space empty of matter. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Vibration:** | A periodic and repetitive movement around an equilibrium point. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Principles of Technology 1- 2003600

**Direct link to this page:**[http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4292.aspx](http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4292.aspx)

## BASIC INFORMATION

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| **Course Title:** | Principles of Technology 1 |
| **Course Number:** | 2003600 |
| **Course Abbreviated Title:** | PRINC TECH 1 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (64)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.910.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. |
| **LACC.910.RST.1.2:** | Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. |
| **LACC.910.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. |
| **LACC.910.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. |
| **LACC.910.RST.2.5:** | Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy). |
| **LACC.910.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. |
| **LACC.910.RST.3.7:** | Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. |
| **LACC.910.RST.3.8:** | Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. |
| **LACC.910.RST.3.9:** | Compare and contrast findings presented in a text to those from |

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| | other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **LACC.910.RST.4.10:** | By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently. |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **SC.912.L.17.11:** | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| **SC.912.L.17.15:** | Discuss the effects of technology on environmental quality. |
| **LACC.910.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and |

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| | deadlines, and individual roles as needed.<br>c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.<br>d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. |
| **LACC.910.SL.1.2:** | Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. |
| **LACC.910.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. |
| **LACC.910.SL.2.4:** | Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
| **LACC.910.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.910.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.<br>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and |

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| | evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.910.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.<br>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.<br>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). |
| **LACC.910.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.910.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing |

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| | what is most significant for a specific purpose and audience. |
| **LACC.910.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. |
| **LACC.910.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **LACC.910.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **LACC.910.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.910.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation). |

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| | 6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and**<br>11. **Evaluate the merits of the explanations produced by others.**<br><br>Remarks/Examples |
| | Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science<br><br>For Students in Grades 9-10<br><br>LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>For Students in Grades 11-12<br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of |

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| | science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented. |

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| | Remarks/Examples<br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus |

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| | divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often |

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| | examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science. |

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| | Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach. |

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| | MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.13:** | Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.<br>Remarks/Examples<br>Using Coulomb's law, determine the force on a stationary charge due to |

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| | other stationary charges, and explain that this force is many times greater than the gravitational force. Recognize the relationship between forces and their associated potential energies and that the electric field is directly related to the rate of change of the electric potential from point to point in space. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.3:** | Compare and contrast work and power qualitatively and quantitatively. |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.5:** | Relate temperature to the average molecular kinetic energy.<br>Remarks/Examples<br>Recognize that the internal energy of an object includes the energy of random motion of the object's atoms and molecules, often referred to as thermal energy. |
| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: |

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| | chemical reactions, orbits around a central body, motion of a pendulum.<br>Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.12.1:** | Distinguish between scalar and vector quantities and assess which should be used to describe an event.<br>Remarks/Examples<br>Distinguish between vector quantities (e.g., displacement, velocity, acceleration, force, and linear momentum) and scalar quantities (e.g., distance, speed, energy, mass, work).<br><br>MACC.912.N-VM.1.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.2:** | Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.<br>Remarks/Examples<br>Solve problems involving distance, velocity, speed, and acceleration. Create and interpret graphs of 1-dimensional motion, such as position versus time, distance versus time, speed versus time, velocity versus time, and acceleration versus time where acceleration is constant.<br><br>CCSS Connections: MACC.912.N-VM.3 (+) Solve problems involving velocity and other quantities that can be represented by vectors. |
| **SC.912.P.12.3:** | Interpret and apply Newton's three laws of motion.<br>Remarks/Examples<br>Explain that when the net force on an object is zero, no acceleration occurs; thus, a moving object continues to move at a constant speed in the same direction, or, if at rest, it remains at rest (Newton's first law). Explain that when a net force is applied to an object its motion will change, or accelerate (according to Newton's second law, F = ma). Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = –F1 on 1 (Newton's third law). |

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| **SC.912.P.12.4:** | Describe how the gravitational force between two objects depends on their masses and the distance between them.<br>Remarks/Examples<br>Describe Newton's law of universal gravitation in terms of the attraction between two objects, their masses, and the inverse square of the distance between them. |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.8.1:** | Differentiate among the four states of matter.<br>Remarks/Examples<br>Differentiate among the four states of matter (solid, liquid, gas and plasma) in terms of energy, particle motion, and phase transitions. (Note: Currently five states of matter have been identified.) |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples<br>Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

## RELATED GLOSSARY TERM DEFINITIONS (52)

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| **Acceleration:** | Rate of change in velocity, usually expressed in meters per second per second; involves an increase or decrease in speed and/or a change in direction. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electric potential:** | A measure of the work required by an electric field to move electric charges. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Experiment:** | A procedure that is carried out and repeated under controlled |

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| | conditions in order to discover, demonstrate, or test a hypothesis. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Liquid:** | One of the fundamental states of matter with a definite volume but no definite shape. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |

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| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Molecule:** | The smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less |

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| | than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |

# Course: Renewable Energy 1- 2003500

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4938.aspx

## BASIC INFORMATION

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| **Course Title:** | Renewable Energy 1 |
| **Course Number:** | 2003500 |
| **Course Abbreviated Title:** | RENEWABLE ENERGY 1 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Elective |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **Version Description:** | The course content includes: an introduction to energy technology, renewable energy in a sustainable future, the science behind climate change, environmental impacts and economics, and careers in renewable energy. Students will be introduced to different types of renewable energy technologies, how they work, their advantages, disadvantages, and limitations. The types of renewable energies and technologies studied include: wind energy, solar (thermal and photovoltaic), hydro-electric, bio-energy, tidal power, wave energy, geothermal energy, ocean thermal, fuel cells, heat pump systems, and high voltage DC energy transport. The availability and integration of these energy types and technologies are also studied to understand how renewable energy can work as a compliment to and replacement for conventional technologies. |

| General Notes: | Special Notes:<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br><br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |
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## STANDARDS (74)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

**Career and Technical Education: Energy Foundations**

01.09 Discuss the history of the U.S. energy industry/infrastructure
01.11 Explain the role of regulatory bodies in the energy industry
01.12 Discuss environmental laws and regulations that impact the energy industry and explain

importance of proper documentation to ensure compliance
03.01 Explain the conventional electric power generation systems and process
03.03 Identify various conventional electric power generation fuel sources and the cost/efficiency/environmental issues associated with each
03.04 Explain how oil was created and list its advantages and disadvantages
03.05 Explain how coal was created and what are its advantages and disadvantages
03.06 Explain how natural gas was created and what are is advantages and disadvantages
03.09 Discuss emerging and alternative electric power generation technologies and fuel sources
03.16 Discuss pros and cons of various energy producing technologies and fuels in the electrical infrastructure
06.04 Explain the educational pathways available to gain training necessary for entry into energy careers at secondary and post-secondary levels

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| **HE.912.C.1.3:** | Evaluate how environment and personal health are interrelated.<br>Remarks/Examples<br>Some examples may include food options within a community, prenatal care services, availability of recreational facilities. |
| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |

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| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and |

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| | creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **SC.912.E.5.8:** | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used to detect and interpret information from electromagnetic radiation sources. |
| **SC.912.E.5.9:** | Analyze the broad effects of space exploration on the economy and culture of Florida.<br>Remarks/Examples |

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| | Recognize the economic, technical and social benefits of spinoff technology developed through the space program. |
| **SC.912.E.6.4:** | Analyze how specific geologic processes and features are expressed in Florida and elsewhere.<br>Remarks/Examples<br>Describe the effect of ocean and Gulf water currents, gravel mining, beach erosion, dune development, aquifers and ground water, salt water intrusion, springs, and sink holes on the formation of the Florida peninsula. Explain the effects of latitude, elevation, topography (land surface type), proximity to large bodies of water, and temperature of ocean currents, on climate in Florida. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of |

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| | historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **SC.912.E.6.6:** | Analyze past, present, and potential future consequences to the |

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| | environment resulting from various energy production technologies.<br>Remarks/Examples<br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples<br>Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.E.7.2:** | Analyze the causes of the various kinds of surface and deep water motion within the oceans and their impacts on the transfer of energy between the poles and the equator.<br>Remarks/Examples<br>Explain how surface and deep-water circulation patterns (Coriolis effect, La Niña, El Niño, Southern Oscillation, upwelling, ocean surface cooling, freshwater influx, density differences, Labrador Current and Gulf Stream) impact energy transfer in the environment. |
| **SC.912.E.7.3:** | Differentiate and describe the various interactions among Earth systems, including: atmosphere, hydrosphere, cryosphere, geosphere, and biosphere.<br>Remarks/Examples<br>Interactions include transfer of energy (biogeochemical cycles, water cycle, ground and surface waters, photosynthesis, radiation, plate tectonics, conduction, and convection), storms, winds, waves, erosion, currents, deforestation and wildfires, hurricanes, tsunamis, volcanoes. |

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| SC.912.E.7.4: | Summarize the conditions that contribute to the climate of a geographic area, including the relationships to lakes and oceans.<br>Remarks/Examples<br>Describe how latitude, altitude, topography, prevailing winds, proximity to large bodies of water, vegetation and ocean currents determine the climate of a geographic area. |
| SC.912.E.7.7: | Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change.<br>Remarks/Examples<br>Explain the possible natural (e.g. increased global temperature, wildfires, volcanic dust) and anthropogenic mechanisms (e.g. air pollution, acid rain, greenhouse gases, burning of fossil fuels) and the effects of these mechanisms on global climate change. |
| SC.912.E.7.8: | Explain how various atmospheric, oceanic, and hydrologic conditions in Florida have influenced and can influence human behavior, both individually and collectively.<br>Remarks/Examples<br>Describe and discuss the conditions that bring about floods, droughts, wildfires, thunderstorms, hurricanes, rip currents, and tsunamis and how these conditions can influence human behavior (e.g. energy alternatives, conservation, migration, storm preparedness). |
| SC.912.E.7.9: | Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.<br>Remarks/Examples<br>Explain how the oceans act as sources/sinks of heat energy, store carbon dioxide mostly as dissolved $HCO3^–$ and $CaCO3$ as precipitate or biogenic carbonate deposits, which have an impact on climate change. |
| SC.912.L.17.11: | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| SC.912.L.17.12: | Discuss the political, social, and environmental consequences of |

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| | sustainable use of land.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated. |
| SC.912.L.17.13: | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| SC.912.L.17.14: | Assess the need for adequate waste management strategies. |
| SC.912.L.17.15: | Discuss the effects of technology on environmental quality. |
| SC.912.L.17.16: | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| SC.912.L.17.17: | Assess the effectiveness of innovative methods of protecting the environment. |
| SC.912.L.17.18: | Describe how human population size and resource use relate to environmental quality. |
| SC.912.L.17.19: | Describe how different natural resources are produced and how their rates of use and renewal limit availability. |
| SC.912.L.17.20: | Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.17.11, SC.912.L.17.13, SC.912.N.1.3. |
| SC.912.N.1.5: | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific |

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| | observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification). |

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| | CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these explanations to others,**<br>10. **Communicate results of scientific investigations, and**<br>11. **Evaluate the merits of the explanations produced by others.** |

| | Remarks/Examples |
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| | Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science<br><br><u>For Students in Grades 9-10</u><br><br>LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br><u>For Students in Grades 11-12</u><br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical |

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| | Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict |

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| | standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis |

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| | supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |

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| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br><br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br><br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.1:** | Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.<br>Remarks/Examples<br><br>Differentiate between kinetic and potential energy. Recognize that energy cannot be created or destroyed, only transformed. Identify examples of transformation of energy: Heat to light in incandescent electric light bulbs; Light to heat in laser drills; Electrical to sound in radios; Sound to electrical in microphones; Electrical to chemical in battery rechargers; Chemical to electrical in dry cells; Mechanical to electrical in generators [power plants]; Nuclear to heat in nuclear reactors; Gravitational potential energy of a falling object is converted to kinetic energy then to heat and sound energy when the object hits the ground. |
| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their |

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| | associated safety issues.<br>Remarks/Examples<br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.14:** | Differentiate among conductors, semiconductors, and insulators.<br>Remarks/Examples<br>Describe band structure, valence electrons, and how the charges flow or rearrange themselves between conductors and insulators. |
| **SC.912.P.10.15:** | Investigate and explain the relationships among current, voltage, resistance, and power.<br>Remarks/Examples<br>Use Ohm's and Kirchhoff's laws to explain the relationships among circuits. |
| **SC.912.P.10.16:** | Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.<br>Remarks/Examples<br>Explain that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers. |
| **SC.912.P.10.17:** | Explore the theory of electromagnetism by explaining electromagnetic waves in terms of oscillating electric and magnetic fields.<br>Remarks/Examples<br>Recognize that an oscillating charge creates an oscillating electric field which gives rise to electromagnetic waves. Recognize a changing magnetic field makes an electric field, and a changing electric field makes a magnetic field, and these phenomena are expressed mathematically through the Faraday law and the Ampere-Maxwell law. |

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| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SS.912.C.2.8:** | Analyze the impact of citizen participation as a means of achieving political and social change.<br>Remarks/Examples<br>Examples are e-mail campaigns, boycotts, blogs, podcasts, protests, demonstrations, letters to editors. |

## RELATED GLOSSARY TERM DEFINITIONS (68)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |

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| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Biosphere:** | The part of the earth and its atmosphere in which living organisms exist or that is capable of supporting life. |
| **Cell:** | The smallest structural unit of an organism that is capable of independent functioning, consisting of cytoplasm and various organelles, all surrounded by a semipermeable cell membrane, which in some cells, is surrounded by a cell wall |
| **Circuit:** | An interconnection of electrical elements forming a complete path for the flow of current. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Conductor:** | A material or an object that conducts heat, electricity, light, or sound. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Deforestation:** | The cutting down and removal of all or most of the trees in a forested area. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |
| **Dune:** | A hill or ridge of sand piled up by the wind. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, |

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| | called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Equator :** | An imaginary circle around Earth's surface located between the poles and a plane perpendicular to its axis of rotation that divides it into the Northern and Southern Hemispheres. |
| **Erosion:** | The wearing away of Earth's surface by the breakdown and transportation of rock and soil. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Geosphere:** | The solid part of the earth consisting of the crust and outer mantle. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hydrosphere:** | All of the Earth's water, including surface water (water in oceans, lakes, and rivers), groundwater (water in soil and beneath the Earth's |

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| | surface), snowcover, ice, and water in the atmosphere, including water vapor. |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Insulator:** | A material or an object that does not easily allow heat, electricity, light, or sound to pass through it. Air, cloth and rubber are good electrical insulators; feathers and wool make good thermal insulators. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Kinetic energy:** | The energy possessed by a body because of its motion. |
| **Latitude:** | A measure of relative position north or south on the Earth's surface, measured in degrees from the equator, which has a latitude of 0°, with the poles having a latitude of 90° north and south. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Magnet:** | An object that produces a magnetic field and that has the property, either natural or induced, of attracting iron or steel. |
| **Magnetic:** | Having the property of attracting iron and certain other materials by virtue of a field of force. |
| **Magnetic field:** | The region where magnetic force exists around magnets or electric currents. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific |

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| | models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Natural resource:** | Something, such as a forest, a mineral deposit, or fresh water, that is found in nature and is necessary or useful to humans. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Observation :** | What one has observed using senses or instruments. |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Pole:** | Either of the points at which the Earth's axis of rotation intersects the Earth's surface; the North Pole or South Pole. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities. |
| **Power:** | The rate at which work is done, expressed as the amount of work per unit time and commonly measured in units such as the watt and horsepower. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Resistance :** | The opposition of a body or substance to current passing through it, resulting in a change of electrical energy into heat or another form of energy. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Semiconductor:** | Any of various solid crystalline substances, such as germanium or silicon, having electrical conductivity greater than insulators but less than good conductors, and used especially as a base material for computer chips and other electronic devices. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Theory :** | A set of statements or principles devised to explain a group of facts |

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| | or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Voltage:** | A measure of the difference in electric potential between two points in space, a material, or an electric circuit, expressed in volts. |
| **Water cycle:** | The path water takes as it is being cycled through the environment, including condensation, evaporation, and precipitation. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Physics 2- 2003410

**Direct link to this page:**http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4303.aspx

## BASIC INFORMATION

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| **Course Title:** | Physics 2 |
| **Course Number:** | 2003410 |
| **Course Abbreviated Title:** | PHYS 2 |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 3 |
| **Status:** | Draft - Board Approval Pending |
| **Honors?** | Yes |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding |

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| | of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes**<br><br>**Instructional Practices**<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence).<br><br>**Science and Engineering Practices** (NRC *Framework for K-12 Science Education, 2010*)<br><br>• Asking questions (for science) and defining problems (for engineering).<br>• Developing and using models.<br>• Planning and carrying out investigations.<br>• Analyzing and interpreting data.<br>• Using mathematics, information and computer technology, and computational thinking.<br>• Constructing explanations (for science) and designing solutions (for engineering).<br>• Engaging in argument from evidence.<br>• Obtaining, evaluating, and communicating information. |

## STANDARDS (87)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| **LACC.1112.RST.1.3:** | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| **LACC.1112.RST.2.4:** | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| **LACC.1112.RST.2.5:** | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| **LACC.1112.RST.2.6:** | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| **LACC.1112.RST.3.7:** | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| **LACC.1112.RST.3.8:** | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| **LACC.1112.RST.3.9:** | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a |

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| | process, phenomenon, or concept, resolving conflicting information when possible. |
| **LACC.1112.RST.4.10:** | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| **LACC.1112.SL.1.1:** | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.<br>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line |

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| | of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |
| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience’s knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the |

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| | discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |

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| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of |

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| | the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples |

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| | Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-VM.1.1:** | Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, \|v\|, \|\|v\|\|, v). |
| **MACC.912.N-VM.1.2:** | Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point. |
| **MACC.912.N-VM.1.3:** | Solve problems involving velocity and other quantities that can be represented by vectors. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of |

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| | the distribution or the existence of extreme data points. |
| MACC.912.S-ID.1.4: | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| MACC.912.S-ID.2.5: | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| MACC.912.S-ID.2.6: | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br><br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications** |

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| | i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.5.10:** | Describe and apply the coordinate system used to locate objects in the sky.<br>Remarks/Examples<br>Discuss how scientists determine the location of constellations, celestial spheres, and sky maps. Compare and contrast the celestial coordinate system (equatorial system) to the use of latitude and longitude to specify locations on Earth. Recognize the use of right ascension and declination in the location of objects in space, including stars and constellations. |
| **SC.912.E.5.11:** | Distinguish the various methods of measuring astronomical distances and apply each in appropriate situations.<br>Remarks/Examples<br>Determine which units of measurement are appropriate to describe distance (e.g. astronomical units, parallax, and light years).<br><br>CCSS Connections: MACC.K12.MP.5: Use appropriate tools strategically; and MACC.K12.MP.6: Attend to precision. |
| **SC.912.E.5.7:** | Relate the history of and explain the justification for future space exploration and continuing technology development.<br>Remarks/Examples<br>Identify examples of historical space exploration (e.g. telescopes, high altitude balloons, lunar landers, deep-space probes, space station) that had significant impact on current space exploration and recognize the importance of continued exploration in space. |
| **SC.912.E.5.8:** | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used |

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| | to detect and interpret information from electromagnetic radiation radiation sources. |
| **SC.912.E.5.9:** | Analyze the broad effects of space exploration on the economy and culture of Florida.<br>Remarks/Examples<br>Recognize the economic, technical and social benefits of spinoff technology developed through the space program. |
| **SC.912.E.6.6:** | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.<br>Remarks/Examples<br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| **SC.912.E.7.7:** | Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change.<br>Remarks/Examples<br>Explain the possible natural (e.g. increased global temperature, wildfires, volcanic dust) and anthropogenic mechanisms (e.g. air pollution, acid rain, greenhouse gases, burning of fossil fuels) and the effects of these mechanisms on global climate change. |
| **SC.912.L.15.2:** | Discuss the use of molecular clocks to estimate how long ago various groups of organisms diverged evolutionarily from one another. |
| **SC.912.L.16.10:** | Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.L.17.11:** | Evaluate the costs and benefits of renewable and nonrenewable |

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| | resources, such as water, energy, fossil fuels, wildlife, and forests. |
| **SC.912.L.17.15:** | Discuss the effects of technology on environmental quality. |
| **SC.912.L.18.12:** | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.N.1.1:** | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural phenomena (inferences),**<br>9. **Use appropriate evidence and reasoning to justify these** |

explanations to others,
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

LACC.1112.WHST.1.2 Write informative/explanatory texts, including the

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| | narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according |

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| | to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for |

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| | science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples<br>Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and |

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| | persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |

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| SC.912.N.3.3: | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| SC.912.N.3.4: | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. Recognize that not all scientific laws have accompanying explanatory theories. |
| SC.912.N.3.5: | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| SC.912.N.4.1: | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| SC.912.N.4.2: | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that |

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| | have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br><br>Recognize and discuss the effect of each force on the structure of matter and the evidence for it. |
| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.<br>Remarks/Examples<br><br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br><br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.16:** | Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.<br>Remarks/Examples<br><br>Explain that moving electric charges produce magnetic forces and |

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| | moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers. |
| **SC.912.P.10.17:** | Explore the theory of electromagnetism by explaining electromagnetic waves in terms of oscillating electric and magnetic fields.<br>Remarks/Examples<br>Recognize that an oscillating charge creates an oscillating electric field which gives rise to electromagnetic waves. Recognize a changing magnetic field makes an electric field, and a changing electric field makes a magnetic field, and these phenomena are expressed mathematically through the Faraday law and the Ampere-Maxwell law. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |
| **SC.912.P.10.19:** | Explain that all objects emit and absorb electromagnetic radiation and distinguish between objects that are blackbody radiators and those that are not. |
| **SC.912.P.10.21:** | Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.<br>Remarks/Examples<br>Describe the apparent change in frequency of waves due to the motion of a source or a receiver (the Doppler effect). |
| **SC.912.P.10.4:** | Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter. |
| **SC.912.P.10.6:** | Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum. |

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| | Remarks/Examples<br>Construct and interpret potential energy diagrams for endothermic and exothermic chemical reactions, and for rising or falling objects. Describe the transformation of energy as a pendulum swings. |
| **SC.912.P.10.8:** | Explain entropy's role in determining the efficiency of processes that convert energy to work.<br>Remarks/Examples<br>Recognize that there is a natural tendency for systems to move in a direction of disorder or randomness (entropy). Describe entropy as a quantity that measures the order or disorder of a system and that this quantity is larger for a more disordered system. |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship $E = hv$). |
| **SC.912.P.12.10:** | Interpret the behavior of ideal gases in terms of kinetic molecular theory.<br>Remarks/Examples<br>Using the kinetic molecular theory, explain the behavior of gases and the relationship between pressure and volume (Boyle's law), volume and temperature (Charles's law), pressure and temperature (Gay-Lussac's law), and number of particles in a gas sample (Avogadro's hypothesis). |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.12.6:** | Qualitatively apply the concept of angular momentum.<br>Remarks/Examples<br>Explain that angular momentum is rotational analogy to linear momentum (e.g. Because angular momentum is conserved, a change in the distribution of mass about the axis of rotation will cause a change in |

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| | the rotational speed [ice skater spinning]). |
| [**SC.912.P.12.8:**]() | Recognize that Newton's Laws are a limiting case of Einstein's Special Theory of Relativity at speeds that are much smaller than the speed of light.<br>Remarks/Examples<br>Recognize that the speed of light in any reference frame is the central postulate of the Special Theory of Relativity. As speeds approach zero, Special Relativity tends towards equivalence with Newton's Laws of Motion. |
| [**SC.912.P.12.9:**]() | Recognize that time, length, and energy depend on the frame of reference.<br>Remarks/Examples<br>The energy *E* and the momentum *p* depend on the frame of reference in which they are measured (e.g. Lorentz contraction). |

## RELATED GLOSSARY TERM DEFINITIONS (60)

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| **Acid:** | A substance that increases the H+ concentration when added to a water solution Acids turn blue litmus paper red, have a pH of less than 7, and their aqueous solutions react with bases and certain metals to form salts. |
| **Angular momentum:** | A vector quantity that is a measure of the rotational momentum of a rotating body or system, that is equal in classical physics to the product of the angular velocity of the body or system and its moment of inertia with respect to the rotation axis, and that is directed along the rotation axis. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Axis:** | The imaginary line on which an object rotates (e.g., Earth’s axis runs through Earth between the North Pole and the South Pole); an imaginary straight line that runs through a body; a reference to the |

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| | line in a coordinate system or graph. |
| **Biotechnology:** | The manipulation (as through genetic engineering) of living organisms or their components to produce useful usually commercial products (as pest resistant crops, new bacterial strains, or novel pharmaceuticals). |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of $9.107 \times 10^{-28}$ grams and an electric charge of approximately $-1.602 \times 10^{-19}$ coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Entropy:** | A measure of the unavailable energy in a closed thermodynamic system that is also usually considered to be a measure of the system's disorder, that is a property of the system's state, and that varies directly with any reversible change in heat in the system and inversely with the temperature of the system. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Experiment:** | A procedure that is carried out and repeated under controlled |

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| | conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Frame of reference:** | A set of coordinate axes in terms of which position or movement may be specified or with reference to which physical laws may be mathematically stated. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Latitude:** | A measure of relative position north or south on the Earth's surface, |

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| | measured in degrees from the equator, which has a latitude of 0°, with the poles having a latitude of 90° north and south. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Magnet:** | An object that produces a magnetic field and that has the property, either natural or induced, of attracting iron or steel. |
| **Magnetic:** | Having the property of attracting iron and certain other materials by virtue of a field of force. |
| **Magnetic field:** | The region where magnetic force exists around magnets or electric currents. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Orbit:** | A path described by one body in its revolution about another (as by the earth about the sun or by an electron about an atomic nucleus). |

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| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Potential energy:** | Energy stored in a physical system due to the object's configuration and position. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Relativity (special theory of):** | The physical theory of space and time developed by Albert Einstein, based on the postulates that all the laws of physics are equally valid in all frames of reference moving at a uniform velocity and that the speed of light from a uniformly moving source is always the same, regardless of how fast or slow the source or its observer is moving. The theory has as consequences the relativistic mass increase of rapidly moving objects, the Lorentz-Fitzgerald contraction, time dilatation, and the principle of mass-energy equivalence. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Speed of light:** | A fundamental physical constant that is the speed at which electromagnetic radiation propagates in a vacuum and that has a value fixed by international convention of 299,792,458 meters per second. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Volume:** | A measure of the amount of space an object takes up; also the loudness of a sound or signal. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

# Course: Nuclear Radiation- 2003400

**Direct link to this page:**[http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4308.aspx](http://www.cpalms.org/Courses/CoursePagePublicPreviewCourse4308.aspx)

## BASIC INFORMATION

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| **Course Title:** | Nuclear Radiation |
| **Course Number:** | 2003400 |
| **Course Abbreviated Title:** | NUCLEAR RADI |
| **Course Path:** | **Section:** Grades PreK to 12 Education Courses **Grade Group:** Grades 9 to 12 and Adult Education Courses **Subject:** Science **SubSubject:** Physical Sciences |
| **Number of Credits:** | One credit (1) |
| **Course length:** | Year (Y) |
| **Course Type:** | Core |
| **Course Level:** | 2 |
| **Status:** | Draft - Board Approval Pending |
| **General Notes:** | Laboratory investigations that include the use of scientific inquiry, research, measurement, problem solving, laboratory apparatus and technologies, experimental procedures, and safety procedures are an integral part of this course. The National Science Teachers Association (NSTA) recommends that at the high school level, all students should be in the science lab or field, collecting data every week. School laboratory investigations (labs) are defined by the National Research Council (NRC) as an experience in the laboratory, classroom, or the field that provides students with opportunities to interact directly with natural phenomena or with data collected by others using tools, materials, data collection techniques, and models (NRC, 2006, p. 3). Laboratory investigations in the high school classroom should help all students develop a growing understanding of the complexity and ambiguity of empirical work, as well as the skills to calibrate and troubleshoot equipment used to make |

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| | observations. Learners should understand measurement error; and have the skills to aggregate, interpret, and present the resulting data (National Research Council, 2006, p.77; NSTA, 2007).<br><br>**Special Notes:** Instructional Practices<br>Teaching from a range of complex text is optimized when teachers in all subject areas implement the following strategies on a routine basis:<br>1. Ensuring wide reading from complex text that varies in length.<br>2. Making close reading and rereading of texts central to lessons.<br>3. Emphasizing text-specific complex questions, and cognitively complex tasks, reinforce focus on the text and cultivate independence.<br>4. Emphasizing students supporting answers based upon evidence from the text.<br>5. Providing extensive research and writing opportunities (claims and evidence). |

## STANDARDS (79)

**Integrate Common Core Standards for Mathematical Practice (MP) as applicable.**

- MACC.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MACC.K12.MP.2.1 Reason abstractly and quantitatively.
- MACC.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
- MACC.K12.MP.4.1 Model with mathematics.
- MACC.K12.MP.5.1 Use appropriate tools strategically.
- MACC.K12.MP.6.1 Attend to precision.
- MACC.K12.MP.7.1 Look for and make use of structure.
- MACC.K12.MP.8.1 Look for and express regularity in repeated reasoning.

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| **LACC.1112.RST.1.1:** | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| **LACC.1112.RST.1.2:** | Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |

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| LACC.1112.RST.1.3: | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| LACC.1112.RST.2.4: | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. |
| LACC.1112.RST.2.5: | Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. |
| LACC.1112.RST.2.6: | Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. |
| LACC.1112.RST.3.7: | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| LACC.1112.RST.3.8: | Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |
| LACC.1112.RST.3.9: | Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. |
| LACC.1112.RST.4.10: | By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. |
| LACC.1112.SL.1.1: | Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.<br><br>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.<br>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed. |

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| | c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.<br>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. |
| **LACC.1112.SL.1.2:** | Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| **LACC.1112.SL.1.3:** | Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used. |
| **LACC.1112.SL.2.4:** | Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
| **LACC.1112.SL.2.5:** | Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. |
| **LACC.1112.WHST.3.8:** | Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| **LACC.1112.WHST.3.9:** | Draw evidence from informational texts to support analysis, reflection, and research. |

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| **LACC.1112.WHST.4.10:** | Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. |
| **LACC.1112.WHST.1.1:** | Write arguments focused on *discipline-specific content.*<br><br>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.<br>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.<br>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.<br>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.<br>e. Provide a concluding statement or section that follows from or supports the argument presented. |
| **LACC.1112.WHST.1.2:** | Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.<br>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.<br>c. Use varied transitions and sentence structures to link the |

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| | major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.<br>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.<br>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). |
| **LACC.1112.WHST.2.4:** | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |
| **LACC.1112.WHST.2.5:** | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. |
| **LACC.1112.WHST.2.6:** | Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. |
| **LACC.1112.WHST.3.7:** | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| **MACC.912.F-IF.2.4:** | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications** |

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| | i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br><br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and |

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| | exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| MACC.912.N-Q.1.1: | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| MACC.912.N-Q.1.3: | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| MACC.912.S-IC.2.6: | Evaluate reports based on data. |
| MACC.912.S-ID.1.1: | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| MACC.912.S-ID.1.2: | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to |

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| | the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **[MACC.912.S-ID.1.3:]** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **[MACC.912.S-ID.2.6:]** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers. |

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| | **Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.5.1:** | Cite evidence used to develop and verify the scientific theory of the Big Bang (also known as the Big Bang Theory) of the origin of the universe.<br>Remarks/Examples<br><br>Explain evidence to support the formation of the universe, which has been expanding for approximately 15 billion year (e.g. ratio of gases, red-shift from distant galaxies, and cosmic background radiation). |
| **SC.912.E.5.2:** | Identify patterns in the organization and distribution of matter in the universe and the forces that determine them.<br>Remarks/Examples<br><br>Identify patterns that influence the formation, heirarchy, and motions of the various kinds of objects in the solar system and the role of gravity and inertia on these motions (include the Sun, Earth, and Moon, planets, satellites, comets, asteroids, star clusters, galaxies, galaxy clusters). Recognize that the universe contains many billions of galaxies, and each galaxy contains many billions of stars. Recognize that constellations are contrived associations of stars that do not reflect functional relationships in space.<br><br>CCSS Connections: MACC.K12.MP.7: Look for and make use of structure. |
| **SC.912.E.5.3:** | Describe and predict how the initial mass of a star determines its evolution.<br>Remarks/Examples<br><br>Compare and contrast the evolution of stars of different masses (include the three outcomes of stellar evolution based on mass: black hole, neutron star, white dwarf). Differentiate between the different types of stars found on the Hertzsprung-Russell diagram and the balance between gravitational collapse and nuclear fusion in determining the color, brightness, and life span of a star. |

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| **SC.912.E.5.4:** | Explain the physical properties of the Sun and its dynamic nature and connect them to conditions and events on Earth.<br>Remarks/Examples<br>Describe the physical properties of the Sun (sunspot cycles, solar flares, prominences, layers of the Sun, coronal mass ejections, and nuclear reactions) and the impact of the Sun as the main source of external energy for the Earth. |
| **SC.912.E.5.7:** | Relate the history of and explain the justification for future space exploration and continuing technology development.<br>Remarks/Examples<br>Identify examples of historical space exploration (e.g. telescopes, high altitude balloons, lunar landers, deep-space probes, space station) that had significant impact on current space exploration and recognize the importance of continued exploration in space. |
| **SC.912.E.5.8:** | Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools.<br>Remarks/Examples<br>Describe how frequency is related to the characteristics of electromagnetic radiation and recognize how spectroscopy is used to detect and interpret information from electromagnetic radiation sources. |
| **SC.912.E.6.6:** | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.<br>Remarks/Examples<br>Investigate and discuss how humans affect and are affected by geological systems and processes by describing the possible long-term consequences (costs and benefits) that increased human consumption (e.g. mining and extraction techniques; off-shore drilling; petrochemical refining) has placed on the environment (e.g. pollution, health, habitat destruction) and the impact on future energy production. |
| **SC.912.E.7.1:** | Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.<br>Remarks/Examples |

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| | Describe that the Earth system contains fixed amounts of each stable chemical element and that each element moves among reservoirs in the solid earth, oceans, atmosphere and living organisms as part of biogeochemical cycles (i.e., nitrogen, water, carbon, oxygen and phosphorus), which are driven by energy from within the Earth and from the Sun. |
| **SC.912.L.14.6:** | Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. |
| **SC.912.L.15.2:** | Discuss the use of molecular clocks to estimate how long ago various groups of organisms diverged evolutionarily from one another. |
| **SC.912.L.16.10:** | Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| **SC.912.L.17.13:** | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| **SC.912.L.17.14:** | Assess the need for adequate waste management strategies. |
| **SC.912.L.17.15:** | Discuss the effects of technology on environmental quality. |
| **SC.912.L.17.16:** | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| **SC.912.L.17.17:** | Assess the effectiveness of innovative methods of protecting the environment. |
| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have |

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| | been made by people from all over the world. |
| SC.912.N.1.6: | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| SC.912.N.1.1: | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:<br><br>1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).<br>2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).<br>3. **Examine books and other sources of information to see what is already known,**<br>4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).<br>5. **Plan investigations,** (Design and evaluate a scientific investigation).<br>6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).<br>7. **Pose answers, explanations, or descriptions of events,**<br>8. **Generate explanations that explicate or describe natural** |

**phenomena (inferences),**

9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.

For Students in Grades 11-12

LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a

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| | problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]<br>MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br><br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br><br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |

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| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.2:** | Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.<br>Remarks/Examples |

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| | Identify scientific questions that can be disproved by experimentation/testing. Recognize that pseudoscience is a claim, belief, or practice which is presented as scientific, but does not adhere to strict standards of science (e.g. controlled variables, sample size, replicability, empirical and measurable evidence, and the concept of falsification).<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.3:** | Identify examples of pseudoscience (such as astrology, phrenology) in society.<br>Remarks/Examples<br>Determine if the phenomenon (event) can be observed, measured, and tested through scientific experimentation. |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the |

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| | social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.2:** | Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.<br>Remarks/Examples<br>Recognize that scientific argument, disagreement, discourse, and discussion create a broader and more accurate understanding of natural processes and events.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.3:** | Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.<br>Remarks/Examples<br>Recognize that a scientific theory provides a broad explanation of many observed phenomena while a scientific law describes how something behaves. |
| **SC.912.N.3.4:** | Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.<br>Remarks/Examples<br>Recognize that theories do not become laws, theories explain laws. |

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| | Recognize that not all scientific laws have accompanying explanatory theories. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples<br>Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.10:** | Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).<br>Remarks/Examples<br>Recognize and discuss the effect of each force on the structure of matter |

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| | and the evidence for it. |
| **SC.912.P.10.11:** | Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.<br>Remarks/Examples<br><br>Identify the three main types of radioactive decay (alpha, beta, and gamma) and compare their properties (composition, mass, charge, and penetrating power). Explain the concept of half-life for an isotope (e.g. C-14 is used to determine the age of objects) and calculate the amount of a radioactive substance remaining after an integral number of half-lives have passed. Recognize that the energy release per gram of material is much larger in nuclear fusion or fission reactions than in chemical reactions due to the large amount of energy related to small amounts of mass by equation E=mc^2. |
| **SC.912.P.10.12:** | Differentiate between chemical and nuclear reactions.<br>Remarks/Examples<br><br>Describe how chemical reactions involve the rearranging of atoms to form new substances, while nuclear reactions involve the change of atomic nuclei into entirely new atoms. Identify real-world examples where chemical and nuclear reactions occur every day. |
| **SC.912.P.10.16:** | Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.<br>Remarks/Examples<br><br>Explain that moving electric charges produce magnetic forces and moving magnets produce electric forces. Recognize the Lorentz force is the force on a point charge due to electromagnetic fields and occurs in many devices, including mass spectrometers. |
| **SC.912.P.10.18:** | Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.<br>Remarks/Examples<br><br>Describe the electromagnetic spectrum (i.e., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays) in terms of frequency, wavelength and energy. Solve problems involving wavelength, frequency, and energy. |

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| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br><br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |
| **SC.912.P.10.9:** | Describe the quantization of energy at the atomic level.<br>Remarks/Examples<br><br>Explain that when electrons transition to higher energy levels they absorb energy, and when they transition to lower energy levels they emit energy. Recognize that spectral lines are the result of transitions of electrons between energy levels that correspond to photons of light with an energy and frequency related to the energy spacing between levels (Planck's relationship $E = hv$). |
| **SC.912.P.12.5:** | Apply the law of conservation of linear momentum to interactions, such as collisions between objects.<br>Remarks/Examples<br><br>(e.g. elastic and completely inelastic collisions). |
| **SC.912.P.8.3:** | Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.<br>Remarks/Examples<br><br>Describe the development and historical importance of atomic theory from Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus and "gold foil" experiment), and Bohr (planetary model of atom), and understand how each discovery leads to modern atomic theory.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.4:** | Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.<br>Remarks/Examples |

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| | Explain that electrons, protons and neutrons are parts of the atom and that the nuclei of atoms are composed of protons and neutrons, which experience forces of attraction and repulsion consistent with their charges and masses.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.P.8.5:** | Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.<br>Remarks/Examples<br>Use the periodic table and electron configuration to determine an element's number of valence electrons and its chemical and physical properties. Explain how chemical properties depend almost entirely on the configuration of the outer electron shell. |

## RELATED GLOSSARY TERM DEFINITIONS (58)

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| **Asteroid:** | A rocky or metallic object that orbits the Sun and is much smaller than a planet. |
| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Atom:** | The smallest unit of a chemical element that can still retain the properties of that element. |
| **Attraction :** | A term used to describe the electric or magnetic force exerted by oppositely charged objects or to describe the gravitational force that pulls objects toward each other. |
| **Big Bang Theory:** | A cosmological theory holding that the universe originated approximately 20 billion years ago from the violent explosion of a very small agglomeration of matter of extremely high density and temperature. |
| **Biotechnology:** | The manipulation (as through genetic engineering) of living organisms or their components to produce useful usually commercial |

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| | products (as pest resistant crops, new bacterial strains, or novel pharmaceuticals). |
| **Comet:** | A celestial body that appears as a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, that consists primarily of ice and dust, and that often develops one or more long tails when near the sun. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Electric field:** | A region associated with a distribution of electric charge or a varying magnetic field in which forces due to that charge or field act upon other electric charges. |
| **Electromagnetic radiation:** | The emission and propagation of the entire range of the electromagnetic spectrum, including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves. |
| **Electromagnetic spectrum:** | The entire range of electromagnetic radiation. At one end of the spectrum are gamma rays, which have the shortest wavelengths and high frequencies. At the other end are radio waves, which have the longest wavelengths and low frequencies. Visible light is near the center of the spectrum. |
| **Electron:** | A stable elementary particle in the lepton family having a mass at rest of 9.107 × 10^-28 grams and an electric charge of approximately -1.602 × 10^-19 coulombs. Electrons orbit about the positively charged nuclei of atoms in distinct orbitals of different energy levels, called shells. |
| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Evolution :** | A theory that the various types of species arise from pre-existing species and that distinguishable characteristics are due to modifications through successive generations. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fission :** | The process by which an atomic nucleus splits into two or more large fragments of comparable mass, simultaneously producing additional |

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| | neutrons and vast amounts of energy; or, a process by which single-cell organisms reproduce asexually. |
| **Force:** | A vector quantity that exists between two objects and, when unbalanced by another force, causes changes in velocity of objects in the direction of its application; a push or pull. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Fusion :** | The process by which two lighter atomic nuclei combine at extremely high temperatures to form a heavier nucleus and release vast amounts of energy. |
| **Galaxy:** | A large collection of stars, gases, and dust that are part of the universe (e.g., the Milky Way galaxy) bound together by gravitational forces. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Genetic:** | Affecting or determined by genes. |
| **Gravity:** | The force of attraction between any two objects. |
| **Habitat:** | A place in an ecosystem where an organism normally lives. |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Infrared :** | Relating to the invisible part of the electromagnetic spectrum with wavelengths longer than those of visible red light but shorter than those of microwaves. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Magnet:** | An object that produces a magnetic field and that has the property, either natural or induced, of attracting iron or steel. |
| **Magnetic:** | Having the property of attracting iron and certain other materials by virtue of a field of force. |
| **Magnetic field:** | The region where magnetic force exists around magnets or electric |

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| | currents. |
| **Mass:** | The amount of matter an object contains. |
| **Matter:** | Substance that possesses inertia and occupies space, of which all objects are constituted. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Momentum:** | A vector quantity that is the product of an object's mass and velocity. |
| **Moon:** | A natural satellite that revolves around a planet. |
| **Neutron:** | A subatomic particle having zero charge, found in the nucleus of an atom. |
| **Nuclear reaction:** | A process, such as fission, fusion, or radioactive decay, in which the structure of an atomic nucleus is altered through release of energy or mass or by being broken apart. |
| **Nucleus:** | The center region of an atom where protons and neutrons are located; also a cell structure that contains the cell genetic material of the cell. |
| **Observation :** | What one has observed using senses or instruments. |
| **Organism:** | An individual form of life of one or more cells that maintains various vital processes necessary for life. |
| **Periodic table:** | A tabular arrangement of the elements according to their atomic numbers so that elements with similar properties are in the same column. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities. |
| **Proton:** | A subatomic particle having a positive charge and which is found in the nucleus of an atom. |
| **Radiation:** | Emission of energy in the form of rays or waves. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |

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| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Sun:** | The closest star to Earth and the center of our solar system. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Ultraviolet :** | Relating to electromagnetic radiation having frequencies higher than those of visible light but lower than those of x-rays, approximately 1015 -1016 hertz. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Wavelength:** | The distance between crests of a wave. |
| **X-ray:** | A high-energy stream of electromagnetic radiation having a frequency higher than that of ultraviolet light but less than that of a gamma ray (in the range of approximately 1016 - 1019 hertz). |

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| | *negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*<br><br>Remarks/Examples<br><br>**Algebra 1, Unit 2**: For F.IF.4 and 5, focus on linear and exponential functions.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context. ii) Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra I column for standards F-IF.6 and F-IF.9.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context<br>ii) Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.<br><br>Compare note (ii) with standard F-IF.7. The function types listed here are the same as those listed in the Algebra II column for standards F-IF.6 and F-IF.9. |
| **MACC.912.F-IF.3.7:** | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.<br><br>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.<br>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.<br>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.<br>d. Graph rational functions, identifying zeros and asymptotes |

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| | when suitable factorizations are available, and showing end behavior.<br>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.<br><br>Remarks/Examples<br>Algebra 1, Unit 2: For F.IF.7a, 7e, and 9 focus on linear and exponentials functions. Include comparisons of two functions presented algebraically. For example, compare the growth of two linear functions, or two exponential functions such as $y=3^n$ and $y=100^2$ |
| **MACC.912.G-MG.1.2:** | Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). |
| **MACC.912.N-Q.1.1:** | Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.N-Q.1.3:** | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br>Remarks/Examples<br>Algebra 1, Unit 1: Working with quantities and the relationships between them provides grounding for work with expressions, equations, and functions. |
| **MACC.912.S-IC.2.6:** | Evaluate reports based on data. |
| **MACC.912.S-ID.1.1:** | Represent data with plots on the real number line (dot plots, histograms, and box plots).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data |

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| | distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.2:** | Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.3:** | Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br>Remarks/Examples<br>In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points. |
| **MACC.912.S-ID.1.4:** | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |
| **MACC.912.S-ID.2.5:** | Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. |
| **MACC.912.S-ID.2.6:** | Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.<br><br>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*<br>b. Informally assess the fit of a function by plotting and |

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| | analyzing residuals.<br>c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>Remarks/Examples<br>Students take a more sophisticated look at using a linear function to model the relationship between two numerical variables. In addition to fitting a line to data, students assess how well the model fits by analyzing residuals.<br><br>S.ID.6b should be focused on linear models, but may be used to preview quadratic functions in Unit 5 of this course.<br><br>**Algebra 1 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Exponential functions are limited to those with domains in the integers.<br><br>**Algebra 2 Assessment Limits and Clarifications**<br><br>i) Tasks have a real-world context.<br>ii) Tasks are limited to exponential functions with domains not in the integers and trigonometric functions. |
| **SC.912.E.7.2:** | Analyze the causes of the various kinds of surface and deep water motion within the oceans and their impacts on the transfer of energy between the poles and the equator.<br>Remarks/Examples<br>Explain how surface and deep-water circulation patterns (Coriolis effect, La Niña, El Niño, Southern Oscillation, upwelling, ocean surface cooling, freshwater influx, density differences, Labrador Current and Gulf Stream) impact energy transfer in the environment. |
| **SC.912.E.7.3:** | Differentiate and describe the various interactions among Earth systems, including: atmosphere, hydrosphere, cryosphere, geosphere, and biosphere.<br>Remarks/Examples |

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| | Interactions include transfer of energy (biogeochemical cycles, water cycle, ground and surface waters, photosynthesis, radiation, plate tectonics, conduction, and convection), storms, winds, waves, erosion, currents, deforestation and wildfires, hurricanes, tsunamis, volcanoes. |
| **SC.912.E.7.4:** | Summarize the conditions that contribute to the climate of a geographic area, including the relationships to lakes and oceans.<br>Remarks/Examples<br>Describe how latitude, altitude, topography, prevailing winds, proximity to large bodies of water, vegetation and ocean currents determine the climate of a geographic area. |
| **SC.912.E.7.5:** | Predict future weather conditions based on present observations and conceptual models and recognize limitations and uncertainties of such predictions.<br>Remarks/Examples<br>Use models, weather maps and other tools to predict weather conditions and differentiate between accuracy of short-range and long-range weather forecasts. |
| **SC.912.E.7.8:** | Explain how various atmospheric, oceanic, and hydrologic conditions in Florida have influenced and can influence human behavior, both individually and collectively.<br>Remarks/Examples<br>Describe and discuss the conditions that bring about floods, droughts, wildfires, thunderstorms, hurricanes, rip currents, and tsunamis and how these conditions can influence human behavior (e.g. energy alternatives, conservation, migration, storm preparedness). |
| **SC.912.E.7.9:** | Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.<br>Remarks/Examples<br>Explain how the oceans act as sources/sinks of heat energy, store carbon dioxide mostly as dissolved $HCO_3^-$ and $CaCO_3$ as precipitate or biogenic carbonate deposits, which have an impact |

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| | on climate change. |
| SC.912.L.17.10: | Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle. |
| SC.912.L.17.11: | Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. |
| SC.912.L.17.13: | Discuss the need for adequate monitoring of environmental parameters when making policy decisions. |
| SC.912.L.17.15: | Discuss the effects of technology on environmental quality. |
| SC.912.L.17.16: | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.<br>Remarks/Examples<br>Integrate HE.912.C.1.3. Evaluate how environment and personal health are interrelated; and, HE.912.C.1.8. Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. |
| SC.912.L.17.4: | Describe changes in ecosystems resulting from seasonal variations, climate change and succession. |
| SC.912.L.17.5: | Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.<br>Remarks/Examples<br>Annually assessed on Biology EOC. Also assesses SC.912.L.17.2; SC.912.L.17.4; SC.912.L.17.8; SC.912.N.1.4. |
| SC.912.L.17.7: | Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems. |
| SC.912.L.18.12: | Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.<br>Remarks/Examples<br>Annually assessed on Biology EOC. |
| SC.912.N.1.1: | Define a problem based on a specific body of knowledge, for |

example: biology, chemistry, physics, and earth/space science, and do the following:

1. **Pose questions about the natural world,** (Articulate the purpose of the investigation and identify the relevant scientific concepts).
2. **Conduct systematic observations,** (Write procedures that are clear and replicable. Identify observables and examine relationships between test (independent) variable and outcome (dependent) variable. Employ appropriate methods for accurate and consistent observations; conduct and record measurements at appropriate levels of precision. Follow safety guidelines).
3. **Examine books and other sources of information to see what is already known,**
4. **Review what is known in light of empirical evidence,** (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).
5. **Plan investigations,** (Design and evaluate a scientific investigation).
6. **Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),** (Collect data or evidence in an organized way. Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration, technique, maintenance, and storage).
7. **Pose answers, explanations, or descriptions of events,**
8. **Generate explanations that explicate or describe natural phenomena (inferences),**
9. **Use appropriate evidence and reasoning to justify these explanations to others,**
10. **Communicate results of scientific investigations, and**
11. **Evaluate the merits of the explanations produced by others.**

Remarks/Examples

Common Core State Standards (CCSS) Connections for 6-12 Literacy in Science

For Students in Grades 9-10

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| | LACC.910.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.<br><br>LACC.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.<br><br>LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.<br><br>LACC.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.910.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>For Students in Grades 11-12<br><br>LACC.1112.RST.1.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.<br><br>LACC.1112.RST.1.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.<br><br>LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.<br><br>LACC.1112.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.<br><br>LACC.1112.WHST.3.9 Draw evidence from informational texts to support analysis, reflection, and research.<br><br>Common Core State Standards (CCSS) Connections for Mathematical Practices<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them.<br>MACC.K12.MP.2: Reason abstractly and quantitatively.<br>MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.] |

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| | MACC.K12.MP.4: Model with mathematics.<br>MACC.K12.MP.5: Use appropriate tools strategically.<br>MACC.K12.MP.6: Attend to precision.<br>MACC.K12.MP.7: Look for and make use of structure.<br>MACC.K12.MP.8: Look for and express regularity in repeated reasoning. |
| **SC.912.N.1.2:** | Describe and explain what characterizes science and its methods.<br>Remarks/Examples<br>Science is characterized by empirical observations, testable questions, formation of hypotheses, and experimentation that results in stable and replicable results, logical reasoning, and coherent theoretical constructs.<br><br>CCSS Connections: MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.1.3:** | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.<br>Remarks/Examples<br>Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.<br><br>CCSS Connections: MACC.K12.MP.2: Reason abstractly and quantitatively; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others |
| **SC.912.N.1.4:** | Identify sources of information and assess their reliability according to the strict standards of scientific investigation.<br>Remarks/Examples<br>Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories. Strict standards of science include controlled variables, sufficient sample size, replication of results, empirical and measurable evidence, and the concept of falsification.<br><br>CCSS Connections: LACC.910.RST.1.1 / LACC.1112.RST.1.1. |

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| **SC.912.N.1.5:** | Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.<br>Remarks/Examples<br>Recognize that contributions to science can be made and have been made by people from all over the world. |
| **SC.912.N.1.6:** | Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.<br>Remarks/Examples<br>Collect data/evidence and use tables/graphs to draw conclusions and make inferences based on patterns or trends in the data.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them. |
| **SC.912.N.1.7:** | Recognize the role of creativity in constructing scientific questions, methods and explanations.<br>Remarks/Examples<br>Work through difficult problems using creativity, and critical and analytical thinking in problem solving (e.g. convergent versus divergent thinking and creativity in problem solving).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.2.1:** | Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).<br>Remarks/Examples<br>Science is the systematic and organized inquiry that is derived from observations and experimentation that can be verified or tested by further investigation to explain natural phenomena (e.g. Science is testable, pseudo-science is not; science seeks falsifications, pseudo-science seeks confirmations.) |
| **SC.912.N.2.4:** | Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific |

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| | argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.<br>Remarks/Examples<br>Recognize that ideas with the most durable explanatory power become established theories, but scientific explanations are continually subjected to change in the face of new evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.2.5:** | Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.<br>Remarks/Examples<br>Recognize that scientific questions, observations, and conclusions may be influenced by the existing state of scientific knowledge, the social and cultural context of the researcher, and the observer's experiences and expectations. Identify possible bias in qualitative and quantitative data analysis. |
| **SC.912.N.3.1:** | Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.<br>Remarks/Examples<br>Explain that a scientific theory is a well-tested hypothesis supported by a preponderance of empirical evidence.<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them; and, MACC.K12.MP.3: Construct viable arguments and critique the reasoning of others. |
| **SC.912.N.3.5:** | Describe the function of models in science, and identify the wide range of models used in science.<br>Remarks/Examples |

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| | Describe how models are used by scientists to explain observations of nature.<br><br>CCSS Connections: MACC.K12.MP.4: Model with mathematics. |
| **SC.912.N.4.1:** | Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.<br>Remarks/Examples<br>Recognize that no single universal step-by-step scientific method captures the complexity of doing science. A number of shared values and perspectives characterize a scientific approach.<br><br>MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.N.4.2:** | Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.<br>Remarks/Examples<br>Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified. Discuss ethics in scientific research to advance society (e.g. global climate change, historical development of medicine and medical practices).<br><br>CCSS Connections: MACC.K12.MP.1: Make sense of problems and persevere in solving them, and MACC.K12.MP.2: Reason abstractly and quantitatively. |
| **SC.912.P.10.2:** | Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.<br>Remarks/Examples<br>Use calorimetry to illustrate conservation of energy. Differentiate between the different types of systems and solve problems involving conservation of energy in simple systems (Physics).Explain how conservation of energy is important in chemical reactions with bond formation and bond breaking (Chemistry). |

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| **SC.912.P.10.20:** | Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.<br>Remarks/Examples<br>Describe the measurable properties of waves (velocity, frequency, wavelength, amplitude, period, reflection and refraction) and explain the relationships among them. Recognize that the source of all waves is a vibration and waves carry energy from one place to another. Distinguish between transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves). Describe sound as a longitudinal wave whose speed depends on the properties of the medium in which it propagates. |

## RELATED GLOSSARY TERM DEFINITIONS (42)

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| **Abiotic:** | An environmental factor not associated with or derived from living organisms. |
| **Atmosphere:** | The layers of gas that surround Earth, other planets, or stars. |
| **Biosphere:** | The part of the earth and its atmosphere in which living organisms exist or that is capable of supporting life. |
| **Biotic:** | Factors in an environment relating to, caused by, or produced by living organisms. |
| **Conduction:** | To transmit heat, sound, or electricity through a medium. |
| **Convection:** | Heat transfer in a gas or liquid by the circulation of currents from one region to another. |
| **Current :** | The amount of electric charge flowing past a specified circuit point per unit time. |
| **Deforestation:** | The cutting down and removal of all or most of the trees in a forested area. |
| **Density:** | Concentration of matter of an object; number of individuals in the same species that live in a given area; the mass per unit volume. |

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| **Energy:** | The capacity to do work. |
| **Environment:** | The sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animals, water, soil, weather, landforms, and air. |
| **Equator :** | An imaginary circle around Earth's surface located between the poles and a plane perpendicular to its axis of rotation that divides it into the Northern and Southern Hemispheres. |
| **Erosion:** | The wearing away of Earth's surface by the breakdown and transportation of rock and soil. |
| **Experiment:** | A procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test a hypothesis. |
| **Fossil:** | A whole or part of an organism that has been preserved in sedimentary rock. |
| **Freeze:** | To pass from the liquid to the solid state by loss of heat from the substance/system. |
| **Frequency:** | The number of cycles or waves per unit time. |
| **Gas:** | One of the fundamental states of matter in which the molecules do not have a fixed volume or shape. |
| **Geosphere:** | The solid part of the earth consisting of the crust and outer mantle. |
| **Heat:** | Energy that transfers between substances because of a temperature difference between the substances; the transfer of energy is always from the warmer substance to the cooler substance |
| **Hydrosphere:** | All of the Earth's water, including surface water (water in oceans, lakes, and rivers), groundwater (water in soil and beneath the Earth's surface), snowcover, ice, and water in the atmosphere, including water vapor. |
| **Hypothesis :** | A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. |
| **Inference :** | The act of reasoning from factual knowledge or evidence. |
| **Investigation :** | A systematic process that uses various types of data and logic and reasoning to better understand something or answer a question. |
| **Latitude:** | A measure of relative position north or south on the Earth's surface, measured in degrees from the equator, which has a latitude of 0°, with the poles having a latitude of 90° north and south. |

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| **Law :** | A statement that describes invariable relationships among phenomena under a specified set of conditions. |
| **Light:** | Electromagnetic radiation that lies within the visible range. |
| **Microscope:** | An instrument with lenses and light that is used to observe objects too small to be visible with only the eyes. |
| **Model :** | A systematic description of an object or phenomenon that shares important characteristics with the object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. |
| **Motion:** | The act or process of changing position and/or direction. |
| **Nonrenewable resource:** | A resource that can only be replenished over millions of years. |
| **Observation :** | What one has observed using senses or instruments. |
| **Pole:** | Either of the points at which the Earth's axis of rotation intersects the Earth's surface; the North Pole or South Pole. |
| **Pollution:** | Any alteration of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
| **Theory :** | A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. |
| **Variable:** | An event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment. |
| **Velocity:** | The time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time. |
| **Vibration:** | A periodic and repetitive movement around an equilibrium point. |
| **Water cycle:** | The path water takes as it is being cycled through the environment, including condensation, evaporation, and precipitation. |
| **Wavelength:** | The distance between crests of a wave. |

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| | human activities. |
| **Polysaccharide:** | Any of a class of carbohydrates, such as starch and cellulose, consisting of a number of monosaccharides joined by glycosidic bonds. |
| **Scientist:** | A person with expert knowledge of one or more sciences, that engages in processes to acquire and communicate knowledge. |
| **Space:** | The limitless expanse where all objects and events occur. Outer space is the region of the universe beyond Earth's atmosphere. |
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