



M/J Comprehensive Science 1, Advanced (#2002050)

This document was generated on CPALMS - www.cpalms.org

Course Number: 2002050

Course Path: Section: Grades PreK to 12 Education
Courses > **Grade Group:** Grades 6 to 8 Education
Courses > **Subject:** Science > **SubSubject:** General
Sciences >

Abbreviated Title: M/J COMP SCI 1 ADV

Course Length: Year (Y)

Course Attributes:

- Class Size Core Required

Course Level: 3

Course Status: Course Approved

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 middle school level, all students should have multiple opportunities every week to explore science laboratory investigations (labs). School laboratory investigations 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 middle 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 (NRC 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.

English Language Development ELD Standards Special Notes Section:

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Science. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link:

<http://www.cpalms.org/uploads/docs/standards/eld/SC.pdf>

For additional information on the development and implementation of the ELD standards, please contact the Bureau of Student Achievement through Language Acquisition at sala@fldoe.org.

Course Standards

Integrate Florida Standards for Mathematical Practice (MP) as applicable.

- MAFS.K12.MP.1.1 Make sense of problems and persevere in solving them.
- MAFS.K12.MP.2.1 Reason abstractly and quantitatively.
- MAFS.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.

- MAFS.K12.MP.4.1 Model with mathematics.
- MAFS.K12.MP.5.1 Use appropriate tools strategically.
- MAFS.K12.MP.6.1 Attend to precision.
- MAFS.K12.MP.7.1 Look for and make use of structure.
- MAFS.K12.MP.8.1 Look for and express regularity in repeated reasoning.

Name	Description
SC.6.E.6.1:	Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition.
SC.6.E.6.2:	Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida.
SC.6.E.7.1:	Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through Earth's system.
SC.6.E.7.2:	Investigate and apply how the cycling of water between the atmosphere and hydrosphere has an effect on weather patterns and climate. Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.
SC.6.E.7.3:	Describe how global patterns such as the jet stream and ocean currents influence local weather in measurable terms such as temperature, air pressure, wind direction and speed, and humidity and precipitation. Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.5: Use appropriate tools strategically MAFS.K12.MP.6: Attend to precision and, MAFS.K12.MP.7: Look for and make use of structure.
SC.6.E.7.4:	Differentiate and show interactions among the geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.
SC.6.E.7.5:	Explain how energy provided by the sun influences global patterns of atmospheric movement and the temperature differences between air, water, and land. Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.
SC.6.E.7.6:	Differentiate between weather and climate.
SC.6.E.7.7:	Investigate how natural disasters have affected human life in Florida.
SC.6.E.7.8:	Describe ways human beings protect themselves from hazardous weather and sun exposure.
SC.6.E.7.9:	Describe how the composition and structure of the atmosphere protects life and insulates the planet. Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.
SC.6.L.14.1:	Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms. Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.
SC.6.L.14.2:	Investigate and explain the components of the scientific theory of cells (cell theory): all organisms are composed of cells (single-celled or multi-cellular), all cells come from pre-existing cells, and cells are the basic unit of life.
SC.6.L.14.3:	Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing.
SC.6.L.14.4:	Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles. Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.
SC.6.L.14.5:	Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis.
SC.6.L.14.6:	Compare and contrast types of infectious agents that may infect the human body, including viruses, bacteria, fungi, and parasites. Remarks/Examples: Integrate HE.6.C.1.8 . Explain how body systems are impacted by hereditary factors and infectious agents.
SC.6.L.15.1:	Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains.
SC.6.N.1.1:	Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions. Remarks/Examples: Florida Standards Connections: LAFS.68.RST.1.3 . Follow precisely a multistep procedure when carrying out <i>experiments</i> , taking measurements, or performing technical tasks.
SC.6.N.1.2:	Explain why scientific investigations should be replicable.
SC.6.N.1.3:	Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each. Remarks/Examples: Explain that an <i>investigation</i> is observing or studying the natural world, without interference or manipulation, and an <i>experiment</i> is an <i>investigation</i> that involves <i>variables</i> (independent/manipulated and dependent/ outcome) and establishes cause-and-effect relationships (Schwartz, 2007).
SC.6.N.1.4:	Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.
SC.6.N.1.5:	Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence. Remarks/Examples: Florida Standards Connections: LAFS.68.RST.3.7 LAFS.68.WHST.1.2 and LAFS.68.WHST.3.9 .
	Distinguish science from other activities involving thought.

SC.6.N.2.1:	Remarks/Examples: Thought refers to any mental or intellectual activity involving an individual's subjective consciousness. Science is a systematic process that pursues, builds and organizes knowledge in the form of testable explanations and predictions about the natural world.
SC.6.N.2.2:	Explain that scientific knowledge is durable because it is open to change as new evidence or interpretations are encountered.
SC.6.N.2.3:	Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals.
SC.6.N.3.1:	Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life.
SC.6.N.3.2:	Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws.
SC.6.N.3.3:	Give several examples of scientific laws.
SC.6.N.3.4:	Identify the role of models in the context of the sixth grade science benchmarks.
SC.6.P.11.1:	Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.4: <u>Model</u> with mathematics.
SC.6.P.12.1:	Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.
SC.6.P.12.1:	Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.
SC.6.P.12.1:	Remarks/Examples: Florida Standards Connections: MAFS.K12.MP.5: Use appropriate tools strategically and, MAFS.K12.MP.6: Attend to precision.
SC.6.P.13.1:	Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.
SC.6.P.13.2:	Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are.
SC.6.P.13.3:	Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.
SC.912.E.7.3:	Differentiate and describe the various interactions among Earth systems, including: atmosphere, hydrosphere, cryosphere, geosphere, and biosphere.
SC.912.E.7.3:	Remarks/Examples: Interactions include transfer of <u>energy</u> (biogeochemical cycles, <u>water cycle</u> , ground and surface waters, photosynthesis, radiation, plate tectonics, <u>conduction</u> , and <u>convection</u>), storms, winds, waves, <u>erosion</u> , currents, <u>deforestation</u> and wildfires, hurricanes, tsunamis, volcanoes.
SC.912.E.7.5:	Predict future weather conditions based on present observations and conceptual models and recognize limitations and uncertainties of such predictions.
SC.912.E.7.5:	Remarks/Examples: Use <u>models</u> , weather maps and other tools to predict weather conditions and differentiate between accuracy of short-range and long-range weather forecasts.
SC.912.E.7.6:	Relate the formation of severe weather to the various physical factors.
SC.912.E.7.6:	Remarks/Examples: Identify the causes of severe weather. Compare and contrast physical factors that affect the formation of severe weather events (e.g. hurricanes, tornados, flash floods, thunderstorms, and drought).
SC.912.L.14.2:	Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).
SC.912.L.14.3:	Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.
SC.912.L.14.3:	Remarks/Examples: Annually Assessed on Biology EOC. Also assesses SC.912.L.14.2 .
SC.912.L.16.14:	Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.
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.10.4:	Remarks/Examples: Explain the mechanisms (<u>convection</u> , <u>conduction</u> and radiation) of <u>heat</u> transfer. Explain how <u>heat</u> is transferred (<u>energy in motion</u>) from a region of higher temperature to a region of lower temperature until equilibrium is established. Solve problems involving <u>heat</u> flow and temperature changes by using known values of specific <u>heat</u> and/or phase change constants (latent <u>heat</u>). Explain the phase transitions and temperature changes demonstrated by a heating or cooling curve.
LAFS.6.SL.1.1:	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion. b. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed. c. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion. d. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.
LAFS.6.SL.1.2:	Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
LAFS.6.SL.1.3:	Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.
LAFS.6.SL.2.4:	Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.
LAFS.6.SL.2.5:	Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.
LAFS.68.RST.1.1:	Cite specific textual evidence to support analysis of science and technical texts.
LAFS.68.RST.1.2:	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
LAFS.68.RST.1.3:	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

LAFS.68.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 6–8 texts and topics.
LAFS.68.RST.2.5:	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
LAFS.68.RST.2.6:	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
LAFS.68.RST.3.7:	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LAFS.68.RST.3.8:	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
LAFS.68.RST.3.9:	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
	Write arguments focused on discipline-specific content.
LAFS.68.WHST.1.1:	<ol style="list-style-type: none"> Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. Establish and maintain a formal style. Provide a concluding statement or section that follows from and supports the argument presented.
	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
LAFS.68.WHST.1.2:	<ol style="list-style-type: none"> Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. Use precise language and domain-specific vocabulary to inform about or explain the topic. Establish and maintain a formal style and objective tone. Provide a concluding statement or section that follows from and supports the information or explanation presented.
LAFS.68.WHST.2.4:	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
LAFS.68.WHST.2.5:	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
LAFS.68.WHST.2.6:	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
LAFS.68.WHST.3.7:	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
LAFS.68.WHST.3.8:	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
LAFS.68.WHST.3.9:	Draw evidence from informational texts to support analysis, reflection, and research.
LAFS.68.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.
MAFS.6.EE.3.9:	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.
MAFS.6.SP.1.3:	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
MAFS.6.SP.2.4:	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
	Summarize numerical data sets in relation to their context, such as by:
MAFS.6.SP.2.5:	<ol style="list-style-type: none"> Reporting the number of observations. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
MAFS.7.SP.2.4:	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.
MAFS.7.SP.3.5:	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.
ELD.K12.ELL.SI.1:	English language learners communicate for social and instructional purposes within the school setting.
	Identify environmental factors that affect personal health.
HE.6.C.1.3:	<p>Remarks/Examples: Air and water quality, availability of sidewalks, contaminated food, and road hazards.</p>
HE.6.C.1.5:	<p>Explain how body systems are impacted by hereditary factors and infectious agents.</p> <p>Remarks/Examples: Cystic fibrosis affects respiratory and a digestive system, sickle-cell anemia affects the circulatory system, and influenza affects the respiratory system.</p>

Related Certifications

[Science \(Elementary Grades 1-6\)](#)

[Science \(Secondary Grades 7-12\)](#)

[Middle Grades Integrated Curriculum \(Middle Grades 5-9\)](#)

[Chemistry \(Grades 6-12\)](#)

[Biology \(Grades 6-12\)](#)

[Middle Grades General Science \(Middle Grades 5-9\)](#)

[Physics \(Grades 6-12\)](#)

[Earth/Space Science \(Grades 6-12\)](#)

[Elementary Education \(Grades K-6\)](#)

[Elementary Education \(Elementary Grades 1-6\)](#)

There are more than 1242 related instructional/educational resources available for this on CPALMS. Click on the following link to access them: <http://www.cpalms.org/Public/PreviewCourse/Preview/13071>