



# Genetics Honors (#2000440)

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<b>Course Number:</b> 2000440	<b>Course Path:</b> Section: Grades PreK to 12 Education Courses > <b>Grade Group:</b> Grades 9 to 12 and Adult Education Courses > <b>Subject:</b> Science > <b>SubSubject:</b> Biological Sciences >
<b>Number of Credits:</b> One (1) credit	<b>Abbreviated Title:</b> GENETICS HON <b>Course Length:</b> Year (Y)
<b>Course Type:</b> Core Academic Course	<b>Course Attributes:</b> • Honors
<b>Course Status:</b> Course Approved	<b>Course Level:</b> 3
<b>Graduation Requirement:</b> Equally Rigorous Science	

## GENERAL NOTES

### 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](mailto:sala@fldoe.org).

## Course Standards

### Integrate 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
<a href="#">SC.912.L.15.8:</a>	Describe the scientific explanations of the origin of life on Earth. <b>Remarks/Examples:</b> Annually assessed on Biology EOC. Also assesses <a href="#">SC.912.N.1.3</a> , <a href="#">SC.912.N.1.4</a> , and <a href="#">SC.912.N.2.1</a> .
<a href="#">SC.912.L.15.9:</a>	Explain the role of reproductive isolation in the process of speciation.
<a href="#">SC.912.L.15.12:</a>	List the conditions for Hardy-Weinberg equilibrium in a population and why these conditions are not likely to appear in nature. Use the Hardy-Weinberg equation to predict genotypes in a population from observed phenotypes.
<a href="#">SC.912.L.15.13:</a>	Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success. <b>Remarks/Examples:</b> Annually assessed on Biology EOC. Also assesses <a href="#">SC.912.L.15.14</a> , <a href="#">SC.912.L.15.15</a> , and <a href="#">SC.912.N.1.3</a> .
<a href="#">SC.912.L.15.14:</a>	Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.
<a href="#">SC.912.L.15.15:</a>	Describe how mutation and genetic recombination increase genetic variation.
<a href="#">SC.912.L.16.1:</a>	Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance. <b>Remarks/Examples:</b> Annually assessed on Biology EOC. Also assesses <a href="#">SC.912.L.16.2</a> .
<a href="#">SC.912.L.16.2:</a>	Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles.
	Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.

<a href="#">SC.912.L.16.3:</a>	<p><b>Remarks/Examples:</b> Integrate <a href="#">HE.912.C.1.7</a>. Analyze how <a href="#">heredity</a> and family history can impact personal health. Annually assessed on Biology EOC. Also assesses <a href="#">SC.912.L.16.4</a> <a href="#">SC.912.L.16.5</a> <a href="#">SC.912.L.16.9</a>.</p>
<a href="#">SC.912.L.16.4:</a>	Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.
<a href="#">SC.912.L.16.5:</a>	Explain the basic processes of transcription and translation, and how they result in the expression of genes.
<a href="#">SC.912.L.16.6:</a>	Discuss the mechanisms for regulation of gene expression in prokaryotes and eukaryotes at transcription and translation level.
<a href="#">SC.912.L.16.7:</a>	Describe how viruses and bacteria transfer genetic material between cells and the role of this process in biotechnology.
	Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.
<a href="#">SC.912.L.16.8:</a>	<p><b>Remarks/Examples:</b> Integrate <a href="#">HE.912.C.1.7</a>. Analyze how <a href="#">heredity</a> and family history can impact personal health.</p>
<a href="#">SC.912.L.16.9:</a>	Explain how and why the genetic code is universal and is common to almost all organisms.
	Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.
<a href="#">SC.912.L.16.10:</a>	<p><b>Remarks/Examples:</b> Annually assessed on Biology EOC.</p>
<a href="#">SC.912.L.16.11:</a>	Discuss the technologies associated with forensic medicine and DNA identification, including restriction fragment length polymorphism (RFLP) analysis.
<a href="#">SC.912.L.16.12:</a>	Describe how basic DNA technology (restriction digestion by endonucleases, gel electrophoresis, polymerase chain reaction, ligation, and transformation) is used to construct recombinant DNA molecules (DNA cloning).
<a href="#">SC.912.L.16.14:</a>	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.
<a href="#">SC.912.L.16.16:</a>	Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.
	Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.
<a href="#">SC.912.L.16.17:</a>	<p><b>Remarks/Examples:</b> Annually assessed on Biology EOC. Also assesses <a href="#">SC.912.L.16.8</a> <a href="#">SC.912.L.16.14</a> <a href="#">SC.912.L.16.16</a>.</p>
	Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.
<a href="#">SC.912.L.17.1:</a>	<p><b>Remarks/Examples:</b> Florida Standards Connections: MAFS.K12.MP.7: Look for and make use of structure.</p>
<a href="#">SC.912.L.17.8:</a>	Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.
	Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.
<a href="#">SC.912.L.18.1:</a>	<p><b>Remarks/Examples:</b> Annually assessed on Biology EOC. Also assesses <a href="#">SC.912.L.18.11</a>.</p>
<a href="#">SC.912.L.18.11:</a>	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.
	<p>Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> <li>1. <b>Pose questions about the natural world</b>, (Articulate the purpose of the investigation and identify the relevant scientific concepts).</li> <li>2. <b>Conduct systematic observations</b>, (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).</li> <li>3. <b>Examine books and other sources of information</b> to see what is already known,</li> <li>4. <b>Review what is known in light of empirical evidence</b>, (Examine whether available empirical evidence can be interpreted in terms of existing knowledge and models, and if not, modify or develop new models).</li> <li>5. <b>Plan investigations</b>, (Design and evaluate a scientific investigation).</li> <li>6. <b>Use tools to gather, analyze, and interpret data</b> (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).</li> <li>7. <b>Pose answers, explanations, or descriptions of events</b>,</li> <li>8. <b>Generate explanations that explicate or describe natural phenomena (inferences)</b>,</li> <li>9. <b>Use appropriate evidence and reasoning to justify these explanations to others</b>,</li> <li>10. <b>Communicate results of scientific investigations, and</b></li> <li>11. <b>Evaluate the merits of the explanations produced by others.</b></li> </ol>
	<p><b>Remarks/Examples:</b> Florida Standards Connections for 6-12 Literacy in Science <a href="#">For Students in Grades 9-10</a></p> <p>LAFS.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.</p> <p>LAFS.910.RST.1.3 Follow precisely a complex multistep procedure when carrying out <a href="#">experiments</a>, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.</p>
<a href="#">SC.912.N.1.1:</a>	<p>LAFS.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.</p> <p>LAFS.910.WHST.1.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ <a href="#">experiments</a>, or technical processes.</p>

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

For Students in Grades 11-12

LAFS.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.

LAFS.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.

LAFS.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.

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

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

Florida Standards Connections for Mathematical Practices

MAFS.K12.MP.1: Make sense of problems and persevere in solving them.

MAFS.K12.MP.2: Reason abstractly and quantitatively.

MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others. [Viable arguments include evidence.]

MAFS.K12.MP.4: Model with mathematics.

MAFS.K12.MP.5: Use appropriate tools strategically.

MAFS.K12.MP.6: Attend to precision.

MAFS.K12.MP.7: Look for and make use of structure.

MAFS.K12.MP.8: Look for and express regularity in repeated reasoning.

Describe and explain what characterizes science and its methods.

**Remarks/Examples:**

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.

Florida Standards Connections: MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others.

[SC.912.N.1.2:](#)

Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).

**Remarks/Examples:**

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.2.1:](#)

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.

**Remarks/Examples:**

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).

Florida Standards Connections: MAFS.K12.MP.3: Construct viable arguments and critique the reasoning of others.

[SC.912.N.2.2:](#)

Describe the function of models in science, and identify the wide range of models used in science.

**Remarks/Examples:**

Describe how models are used by scientists to explain observations of nature.

Florida Standards Connections: MAFS.K12.MP.4: Model with mathematics.

[SC.912.N.3.5:](#)

Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.

**Remarks/Examples:**

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.12.12:](#)

LAFS.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.

[LAFS.1112.RST.1.1:](#)

LAFS.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.

[LAFS.1112.RST.1.2:](#)

LAFS.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.

[LAFS.1112.RST.1.3:](#)

LAFS.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.

[LAFS.1112.RST.2.4:](#)

LAFS.1112.RST.2.5: Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

[LAFS.1112.RST.2.5:](#)

LAFS.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.

[LAFS.1112.RST.2.6:](#)

LAFS.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.

[LAFS.1112.RST.3.7:](#)

LAFS.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.

[LAFS.1112.RST.3.8:](#)

LAFS.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.

[LAFS.1112.RST.3.9:](#)

<a href="#">LAFS.1112.RST.4.10:</a>	By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently. 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.
<a href="#">LAFS.1112.SL.1.1:</a>	<ul style="list-style-type: none"> <li>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.</li> <li>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</li> <li>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.</li> <li>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.</li> </ul>
<a href="#">LAFS.1112.SL.1.2:</a>	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.
<a href="#">LAFS.1112.SL.1.3:</a>	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.
<a href="#">LAFS.1112.SL.2.4:</a>	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.
<a href="#">LAFS.1112.SL.2.5:</a>	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.
<a href="#">LAFS.1112.WHST.1.1:</a>	<p>Write arguments focused on discipline-specific content.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>e. Provide a concluding statement or section that follows from or supports the argument presented.</li> </ul>
<a href="#">LAFS.1112.WHST.1.2:</a>	<p>Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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).</li> </ul>
<a href="#">LAFS.1112.WHST.2.4:</a>	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
<a href="#">LAFS.1112.WHST.2.5:</a>	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.
<a href="#">LAFS.1112.WHST.2.6:</a>	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.
<a href="#">LAFS.1112.WHST.3.7:</a>	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.
<a href="#">LAFS.1112.WHST.3.8:</a>	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.
<a href="#">LAFS.1112.WHST.3.9:</a>	Draw evidence from informational texts to support analysis, reflection, and research.
<a href="#">LAFS.1112.WHST.4.10:</a>	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.
<a href="#">MAFS.912.F-IF.2.4:</a>	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. ★
<a href="#">MAFS.912.F-IF.3.7:</a>	<p>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★</p> <ul style="list-style-type: none"> <li>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.</li> <li>b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.</li> <li>c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.</li> <li>d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.</li> <li>e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift.</li> </ul>
<a href="#">MAFS.912.G-MG.1.2:</a>	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). ★
<a href="#">MAFS.912.N-Q.1.1:</a>	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. ★

<a href="#">MAFS.912.N-Q.1.3:</a>	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. ★
<a href="#">MAFS.912.S-IC.2.6:</a>	Evaluate reports based on data. ★
	Represent data with plots on the real number line (dot plots, histograms, and box plots). ★
<a href="#">MAFS.912.S-ID.1.1:</a>	<p><b>Remarks/Examples:</b> 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.</p>
	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. ★
<a href="#">MAFS.912.S-ID.1.2:</a>	<p><b>Remarks/Examples:</b> 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.</p>
	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ★
<a href="#">MAFS.912.S-ID.1.3:</a>	<p><b>Remarks/Examples:</b> 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.</p>
<a href="#">MAFS.912.S-ID.1.4:</a>	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. ★
<a href="#">MAFS.912.S-ID.2.5:</a>	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. ★
	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. ★
	<ol style="list-style-type: none"> <li>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, and exponential models.</li> <li>Informally assess the fit of a function by plotting and analyzing residuals.</li> <li>Fit a linear function for a scatter plot that suggests a linear association.</li> </ol>
<a href="#">MAFS.912.S-ID.2.6:</a>	<p><b>Remarks/Examples:</b> 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.</p>
<a href="#">ELD.K12.ELL.SC.1:</a>	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.
<a href="#">ELD.K12.ELL.SI.1:</a>	English language learners communicate for social and instructional purposes within the school setting.
	Evaluate how environment and personal health are interrelated.
<a href="#">HE.912.C.1.3:</a>	<p><b>Remarks/Examples:</b> Food options within a community; prenatal-care services; availability of recreational facilities; air quality; weather-safety awareness; and weather, air, and water conditions.</p>
	Analyze how heredity and family history can impact personal health.
<a href="#">HE.912.C.1.7:</a>	<p><b>Remarks/Examples:</b> Drug use, family obesity, heart disease, mental health, and non-communicable illness or disease.</p>

## Related Certifications

[Science \(Secondary Grades 7-12\)](#)  
[Biology \(Grades 6-12\)](#)

There are more than 1106 related instructional/educational resources available for this on CPALMS. Click on the following link to access them: <http://www.cpalms.org/Public/PreviewCourse/Preview/13099>