Florida Science

Forensic Science (2024)

Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools. SC.912.E.5.8	1 Connect the concepts of radiation and the electromagnetic spectrum to the use of historical and newly-developed observational tools. SC.912.E.5.8
Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science. SC.912.L.14.1	2 Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science. SC.912.L.14.1
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.14.2	3 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.14.2
Compare and contrast structure and function of various types of microscopes. SC.912.L.14.4	4 Compare and contrast structure and function of various types of microscopes. SC.912.L.14.4
Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public he	5 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.14.6

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Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue. SC.912.L.14.11	**6** **Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue.** SC.912.L.14.11
Describe the anatomy and histology of bone tissue. SC.912.L.14.12	**7** **Describe the anatomy and histology of bone tissue.** SC.912.L.14.12
Describe the composition and physiology of blood, including that of the plasma and the formed elements. SC.912.L.14.34	**8** **Describe the composition and physiology of blood, including that of the plasma and the formed elements.** SC.912.L.14.34
Describe the steps in hemostasis, including the mechanism of coagulation. Include the basis for blood typing and transfusion reactions. SC.912.L.14.35	**9** **Describe the steps in hemostasis, including the mechanism of coagulation. Include the basis for blood typing and transfusion reactions.** SC.912.L.14.35
Describe the function of the vertebrate integumentary system. SC.912.L.14.51	**10** **Describe the function of the vertebrate integumentary system.** SC.912.L.14.51
Describe how mutation and genetic recombination increase genetic variation. SC.912.L.15.15	**11** **Describe how mutation and genetic recombination increase genetic variation.** SC.912.L.15.15
Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple all	**12** **Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles.** SC.912.L.16.2

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Explain how and why the genetic code is universal and is common to almost all organisms. SC.912.L.16.9	**13** **Explain how and why the genetic code is universal and is common to almost all organisms.** SC.912.L.16.9
Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues. SC.912.L.16.10	**14** **Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.** SC.912.L.16.10
Discuss the technologies associated with forensic medicine and DNA identification, including restriction fragment length polymorphism (RFLP) analysis. SC.912.L.16.11	**15** **Discuss the technologies associated with forensic medicine and DNA identification, including restriction fragment length polymorphism (RFLP) analysis.** SC.912.L.16.11
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). SC.912.L.16.12	**16** **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).** SC.912.L.16.12
Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution. SC.912.L.17.1	**17** **Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.** SC.912.L.17.1
Describe the basic molecular structures an th	**18** **Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.** SC.912.L.18.1

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categories of biological macromolecules. SC.912.L.18.1

Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: Pose questions about the natural world, (Articulate the purpose of the investigation and identify the relevant scientific concepts). 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). Examine books and other sources of information to see what is already known, 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). Plan inv an investigation). Use tools

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19 Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: Pose questions about the natural world, (Articulate the purpose of the investigation and identify the relevant scientific concepts). 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). Examine books and other sources of information to see what is already known, 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). Plan investigations, (Design and evaluate a scientific investigation). 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). Pose answers, explanations, or descriptions of events, Generate explanations that explicate or describe natural phenomena (inferences), Use appropriate evidence and reasoning to justify these explanations to others, Communicate results of scientific investigations, and Evaluate the merits of the explanations produced by others. SC.912.N.1.1

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). Pose answers, explanations, or descriptions of events, Generate explanations that explicate or describe natural phenomena (inferences), Use appropriate evidence and reasoning to justify these explanations to others, Communicate results of scientific investigations, and Evaluate the merits of the explanations produced by others. SC.912.N.1.1	
Describe and explain what characterizes science and its methods. SC.912.N.1.2	20 Describe and explain what characterizes science and its methods. SC.912.N.1.2
Recognize that the strength or usefulness of a s ev	21 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. SC.912.N.1.3

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scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented. SC.912.N.1.3	
Identify sources of information and assess their reliability according to the strict standards of scientific investigation. SC.912.N.1.4	**22 Identify sources of information and assess their reliability according to the strict standards of scientific investigation.** SC.912.N.1.4
Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied. SC.912.N.1.6	**23 Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.** SC.912.N.1.6
Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science). SC.912.N.2.1	**24 Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).** SC.912.N.2.1
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 str du	**25 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.** SC.912.N.2.4

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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. SC.912.N.3.1	26 **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.** SC.912.N.3.1
Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science. SC.912.N.3.2	27 **Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.** SC.912.N.3.2
Describe the function of models in science, and identify the wide range of models used in science. SC.912.N.3.5	28 **Describe the function of models in science, and identify the wide range of models used in science.** SC.912.N.3.5
Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making. SC.912.N.4.1	29 **Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.** SC.912.N.4.1
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. SC.912.N.4.2	30 **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.** SC.912.N.4.2
Differentiate among the fou ma	31 **Differentiate among the four states of matter.** SC.912.P.8.1

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Differentiate between physical and chemical properties and physical and chemical changes of matter. SC.912.P.8.2	**32** **Differentiate between physical and chemical properties and physical and chemical changes of matter.** SC.912.P.8.2
Interpret formula representations of molecules and compounds in terms of composition and structure. SC.912.P.8.7	**33** **Interpret formula representations of molecules and compounds in terms of composition and structure.** SC.912.P.8.7
Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH. SC.912.P.8.11	**34** **Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.** SC.912.P.8.11
Describe the properties of the carbon atom that make the diversity of carbon compounds possible. SC.912.P.8.12	**35** **Describe the properties of the carbon atom that make the diversity of carbon compounds possible.** SC.912.P.8.12
Differentiate among the various forms of energy and recognize that they can be transformed from one form to others. SC.912.P.10.1	**36** **Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.** SC.912.P.10.1
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. SC.912.P.10.18	**37** **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.** SC.912.P.10.18
Describe the measurable pr ex an	**38** **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.** SC.912.P.10.20

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these properties change when the wave moves from one medium to another. SC.912.P.10.20		
Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver. SC.912.P.10.21	39	Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver. SC.912.P.10.21
Distinguish between scalar and vector quantities and assess which should be used to describe an event. SC.912.P.12.1	40	Distinguish between scalar and vector quantities and assess which should be used to describe an event. SC.912.P.12.1
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. SC.912.P.12.2	41	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. SC.912.P.12.2
Interpret and apply Newton's three laws of motion. SC.912.P.12.3	42	Interpret and apply Newton's three laws of motion. SC.912.P.12.3
Apply the law of conservation of linear momentum to interactions, such as collisions between objects. SC.912.P.12.5	43	Apply the law of conservation of linear momentum to interactions, such as collisions between objects. SC.912.P.12.5
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 mo	44	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. SC.912.P.12.7

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Recognize that time, length, and energy depend on the frame of reference. SC.912.P.12.9	**45** **Recognize that time, length, and energy depend on the frame of reference.** SC.912.P.12.9
Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction. SC.912.P.12.12	**46** **Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.** SC.912.P.12.12
Actively participate in effortful learning both individually and collectively.Mathematicians who participate in effortful learning both individually and with others: Analyze the problem in a way that makes sense given the task.Ask questions that will help with solving the task.Build perseverance by modifying methods as needed while solving a challenging task.Stay engaged and maintain a positive mindset when working to solve tasks.Help and support each other when attempting a new method or approach. MA.K12.MTR.1.1	**47** **Actively participate in effortful learning both individually and collectively.Mathematicians who participate in effortful learning both individually and with others: Analyze the problem in a way that makes sense given the task.Ask questions that will help with solving the task.Build perseverance by modifying methods as needed while solving a challenging task.Stay engaged and maintain a positive mindset when working to solve tasks.Help and support each other when attempting a new method or approach.** MA.K12.MTR.1.1
Demonstrate understanding by representing problems in multiple ways.Mathematicians who demonstrate understanding by re in un	**48** **Demonstrate understanding by representing problems in multiple ways.Mathematicians who demonstrate understanding by representing problems in multiple ways: Build understanding through modeling and using manipulatives.Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.Progress from modeling problems with objects and drawings to using algorithms and equations.Express connections between concepts and representations.Choose a representation based on the given context or purpose.** MA.K12.MTR.2.1

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modeling and using manipulatives.Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.Progress from modeling problems with objects and drawings to using algorithms and equations.Express connections between concepts and representations.Choose a representation based on the given context or purpose. MA.K12.MTR.2.1

Complete tasks with mathematical fluency.Mathematicians who complete tasks with mathematical fluency:Select efficient and appropriate methods for solving problems within the given context.Maintain flexibility and accuracy while performing procedures and mental calculations.Complete tasks accurately and with confidence.Adapt procedures to apply them to a new context.Use feedback to improve efficiency when performing calculations. MA.K12.MTR.3.1

49 Complete tasks with mathematical fluency.Mathematicians who complete tasks with mathematical fluency:Select efficient and appropriate methods for solving problems within the given context.Maintain flexibility and accuracy while performing procedures and mental calculations.Complete tasks accurately and with confidence.Adapt procedures to apply them to a new context.Use feedback to improve efficiency when performing calculations. MA.K12.MTR.3.1

Engage in discussions that reflect on the mathematical thinking of self and others.Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:Communicate mathematical ideas, vocabulary and methods effectively.Analyze the mathematical thinking of others.Compare the efficiency of a method to those expressed by others.Recognize errors and suggest how to correctly solve the task.Justify results by explaining methods and processes.Construct possible arguments based on evidence. MA.K12.MTR.4.1

50 Engage in discussions that reflect on the mathematical thinking of self and others.Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:Communicate mathematical ideas, vocabulary and methods effectively.Analyze the mathematical thinking of others.Compare the efficiency of a method to those expressed by others.Recognize errors and suggest how to correctly solve the task.Justify results by explaining methods and processes.Construct possible arguments based on evidence. MA.K12.MTR.4.1

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thinking of self and others:Communicate mathematical ideas, vocabulary and methods effectively.Analyze the mathematical thinking of others.Compare the efficiency of a method to those expressed by others.Recognize errors and suggest how to correctly solve the task.Justify results by explaining methods and processes.Construct possible arguments based on evidence. MA.K12.MTR.4.1

Use patterns and structure to help understand and connect mathematical concepts.Mathematicians who use patterns and structure to help understand and connect mathematical concepts:Focus on relevant details within a problem.Create plans and procedures to logically order events, steps or ideas to solve problems.Decompose a complex problem into manageable parts.Relate previously learned concepts to new concepts.Look for similarities among problems.Connect solutions of problems to more complicated large-scale situations. MA.K12.MTR.5.1

51 Use patterns and structure to help understand and connect mathematical concepts.Mathematicians who use patterns and structure to help understand and connect mathematical concepts:Focus on relevant details within a problem.Create plans and procedures to logically order events, steps or ideas to solve problems.Decompose a complex problem into manageable parts.Relate previously learned concepts to new concepts.Look for similarities among problems.Connect solutions of problems to more complicated large-scale situations. MA.K12.MTR.5.1

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Assess the reasonableness of solutions.Mathematicians who assess the reasonableness of solutions:Estimate to discover possible solutions.Use

solutions.Mathematicians who assess the reasonableness of solutions:Estimate to discover possible solutions.Use benchmark quantities to determine if a solution makes sense.Check calculations when solving problems.Verify possible solutions by explaining the methods used.Evaluate results based on the given context. MA.K12.MTR.6.1		benchmark quantities to determine if a solution makes sense.Check calculations when solving problems.Verify possible solutions by explaining the methods used.Evaluate results based on the given context. MA.K12.MTR.6.1
Apply mathematics to real-world contexts.Mathematicians who apply mathematics to real-world contexts:Connect mathematical concepts to everyday experiences.Use models and methods to understand, represent and solve problems.Perform investigations to gather data or determine if a method is appropriate.Redesign models and methods to improve accuracy or efficiency. MA.K12.MTR.7.1	53	Apply mathematics to real-world contexts.Mathematicians who apply mathematics to real-world contexts:Connect mathematical concepts to everyday experiences.Use models and methods to understand, represent and solve problems.Perform investigations to gather data or determine if a method is appropriate.Redesign models and methods to improve accuracy or efficiency. MA.K12.MTR.7.1
Cite evidence to explain and justify reasoning. ELA.K12.EE.1.1	54	Cite evidence to explain and justify reasoning. ELA.K12.EE.1.1
Read and comprehend grade-level complex texts proficiently. ELA.K12.EE.2.1	55	Read and comprehend grade-level complex texts proficiently. ELA.K12.EE.2.1
Ma su	Skip to main content	Make inferences to support comprehension. ELA.K12.EE.3.1

comprehension. ELA.K12.EE.3.1

Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. ELA.K12.EE.4.1

57 Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. ELA.K12.EE.4.1

Use the accepted rules governing a specific format to create quality work. ELA.K12.EE.5.1

58 Use the accepted rules governing a specific format to create quality work. ELA.K12.EE.5.1

Use appropriate voice and tone when speaking or writing. ELA.K12.EE.6.1

59 Use appropriate voice and tone when speaking or writing. ELA.K12.EE.6.1

English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science. ELD.K12.ELL.SC.1

60 English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science. ELD.K12.ELL.SC.1

English language learners communicate for social and instructional purposes within the school setting. ELD.K12.ELL.SI.1

61 English language learners communicate for social and instructional purposes within the school setting. ELD.K12.ELL.SI.1