Florida Science

Biology 1 (2024)

Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon. SC.912.E.7.1	1 **Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.** SC.912.E.7.1
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 the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells. SC.912.L.14.3	4 **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
Compare and contrast structure and function of various types of microscopes. SC.912.L.14.4	5 **Compare and contrast structure and function of various types of microscopes.** SC.912.L.14.4
Ex[Skip to main content]of	**xplain the significance of genetic factors, environmental factors, and pathogenic gents to health from the perspectives of both individual and public**

environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. SC.912.L.14.6		health. SC.912.L.14.6
Relate the structure of each of the major plant organs and tissues to physiological processes. SC.912.L.14.7	7	Relate the structure of each of the major plant organs and tissues to physiological processes. SC.912.L.14.7
Identify the major parts of the brain on diagrams or models. SC.912.L.14.26	8	Identify the major parts of the brain on diagrams or models. SC.912.L.14.26
Describe the factors affecting blood flow through the cardiovascular system. SC.912.L.14.36	9	Describe the factors affecting blood flow through the cardiovascular system. SC.912.L.14.36
Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics. SC.912.L.14.52	10	Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics. SC.912.L.14.52
Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change. SC.912.L.15.1	11	Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change. SC.912.L.15.1
Describe how and why organisms are hie an	12	Describe how and why organisms are hierarchically classified and based on evolutionary relationships. SC.912.L.15.4

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evolutionary relationships. SC.912.L.15.4	
Explain the reasons for changes in how organisms are classified. SC.912.L.15.5	**13** **Explain the reasons for changes in how organisms are classified.** SC.912.L.15.5
Discuss distinguishing characteristics of the domains and kingdoms of living organisms. SC.912.L.15.6	**14** **Discuss distinguishing characteristics of the domains and kingdoms of living organisms.** SC.912.L.15.6
Describe the scientific explanations of the origin of life on Earth. SC.912.L.15.8	**15** **Describe the scientific explanations of the origin of life on Earth.** SC.912.L.15.8
Identify basic trends in hominid evolution from early ancestors six million years ago to modern humans, including brain size, jaw size, language, and manufacture of tools. SC.912.L.15.10	**16** **Identify basic trends in hominid evolution from early ancestors six million years ago to modern humans, including brain size, jaw size, language, and manufacture of tools.** SC.912.L.15.10
Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success. SC.912.L.15.13	**17** **Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.** SC.912.L.15.13
Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow. SC.912.L.15.14	**18** **Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.** SC.912.L.15.14

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Describe how mutation and genetic recombination increase genetic variation. SC.912.L.15.15	19 Describe how mutation and genetic recombination increase genetic variation. SC.912.L.15.15
Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance. SC.912.L.16.1	20 Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance. SC.912.L.16.1
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	21 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
Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information. SC.912.L.16.3	22 Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information. SC.912.L.16.3
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. SC.912.L.16.4	23 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. SC.912.L.16.4
Explain the basic processes of transcription and translation, and how they result in the ex ge	24 Explain the basic processes of transcription and translation, and how they result in the expression of genes. SC.912.L.16.5

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Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer. SC.912.L.16.8	**25** **Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.** SC.912.L.16.8
Explain how and why the genetic code is universal and is common to almost all organisms. SC.912.L.16.9	**26** **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	**27** **Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.** SC.912.L.16.10
Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy. SC.912.L.16.13	**28** **Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy.** SC.912.L.16.13
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.L.16.14	**29** **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.L.16.14
Describe the process of meiosis, including inc as: ove Skip to main content	**30** **Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.** SC.912.L.16.16

reduction division results in the formation of haploid gametes or spores. SC.912.L.16.16	
Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation. SC.912.L.16.17	31 Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation. SC.912.L.16.17
Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature. SC.912.L.17.2	32 Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature. SC.912.L.17.2
Describe changes in ecosystems resulting from seasonal variations, climate change and succession. SC.912.L.17.4	33 Describe changes in ecosystems resulting from seasonal variations, climate change and succession. SC.912.L.17.4
Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity. SC.912.L.17.5	34 Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity. SC.912.L.17.5
Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, no sp	35 Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species. SC.912.L.17.8

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Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels. SC.912.L.17.9	36	**Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.** SC.912.L.17.9
Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. SC.912.L.17.11	37	**Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.** SC.912.L.17.11
Discuss the need for adequate monitoring of environmental parameters when making policy decisions. SC.912.L.17.13	38	**Discuss the need for adequate monitoring of environmental parameters when making policy decisions.** SC.912.L.17.13
Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability. SC.912.L.17.20	39	**Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.** SC.912.L.17.20
Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules. SC.912.L.18.1	40	**Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.** SC.912.L.18.1
Identify the reactants, products, and basic functions of photosynthesis. SC.912.L.18.7	41	**Identify the reactants, products, and basic functions of photosynthesis.** SC.912.L.18.7
Ide pr functions of aerobic and		**Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration.** SC.912.L.18.8

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anaerobic cellular respiration. SC.912.L.18.8	
Explain the interrelated nature of photosynthesis and cellular respiration. SC.912.L.18.9	43 Explain the interrelated nature of photosynthesis and cellular respiration. SC.912.L.18.9
Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell. SC.912.L.18.10	44 Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell. SC.912.L.18.10
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.18.11	45 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.18.11
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. SC.912.L.18.12	46 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. SC.912.L.18.12
Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: SC.912.N.1.1	1 Pose questions about the natural world, (Articulate the purpose of the investigation and identify the relevant scientific concepts). SC.912.N.1.1.1
	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). SC.912.N.1.1.2
	:xamine books and other sources of information to see what is already :nown, SC.912.N.1.1.3

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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).** SC.912.N.1.1.4

5 **Plan investigations, (Design and evaluate a scientific investigation).** SC.912.N.1.1.5

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).** SC.912.N.1.1.6

7 **Pose answers, explanations, or descriptions of events,** SC.912.N.1.1.7

8 **Generate explanations that explicate or describe natural phenomena (inferences),** SC.912.N.1.1.8

9 **Use appropriate evidence and reasoning to justify these explanations to others,** SC.912.N.1.1.9

10 **Communicate results of scientific investigations, and** SC.912.N.1.1.10

11 **Evaluate the merits of the explanations produced by others.** SC.912.N.1.1.11

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

48 **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

Identify sources of information and assess their reliability according to the strict standards of scientific investigation. SC.912.N.1.4

49 **Identify sources of information and assess their reliability according to the strict standards of scientific investigation.** SC.912.N.1.4

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Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied. SC.912.N.1.6	**50** **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	**51** **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
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. SC.912.N.2.2	**52** **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.** SC.912.N.2.2
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	**53** **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
Recognize that theories do not become laws, nor do laws become theories; theories are we ex	**54** **Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.** SC.912.N.3.4

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are well supported descriptions. SC.912.N.3.4	
Actively participate in effortful learning both individually and collectively. MA.K12.MTR.1.1	**55** **Actively participate in effortful learning both individually and collectively.** MA.K12.MTR.1.1
Demonstrate understanding by representing problems in multiple ways. MA.K12.MTR.2.1	**56** **Demonstrate understanding by representing problems in multiple ways.** MA.K12.MTR.2.1
Complete tasks with mathematical fluency. MA.K12.MTR.3.1	**57** **Complete tasks with mathematical fluency.** MA.K12.MTR.3.1
Engage in discussions that reflect on the mathematical thinking of self and others. MA.K12.MTR.4.1	**58** **Engage in discussions that reflect on the mathematical thinking of self and others.** MA.K12.MTR.4.1
Use patterns and structure to help understand and connect mathematical concepts. MA.K12.MTR.5.1	**59** **Use patterns and structure to help understand and connect mathematical concepts.** MA.K12.MTR.5.1
Assess the reasonableness of solutions. MA.K12.MTR.6.1	**60** **Assess the reasonableness of solutions.** MA.K12.MTR.6.1
Apply mathematics to real-world contexts. MA.K12.MTR.7.1	**61** **Apply mathematics to real-world contexts.** MA.K12.MTR.7.1
Cite evidence to explain and justify reasoning. ELA.K12.EE.1.1	**62** **Cite evidence to explain and justify reasoning.** ELA.K12.EE.1.1
Read and comprehend grade-level complex te pr Skip to main content	**63** **Read and comprehend grade-level complex texts proficiently.** ELA.K12.EE.2.1

Make inferences to support comprehension. ELA.K12.EE.3.1	**64** **Make inferences to support 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	**65** **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	**66** **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	**67** **Use appropriate voice and tone when speaking or writing.** ELA.K12.EE.6.1
(Archived Standard): Evaluate how environment and personal health are interrelated. HE.912.C.1.3	**68** **(Archived Standard): Evaluate how environment and personal health are interrelated.** HE.912.C.1.3
(Archived Standard): Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases. HE.912.C.1.5	**69** **(Archived Standard): Analyze strategies for prevention, detection, and treatment of communicable and chronic diseases.** HE.912.C.1.5
(Archived Standard): Analyze how heredity and family history can impact personal health. HE.912.C.1.7	**70** **(Archived Standard): Analyze how heredity and family history can impact personal health.** HE.912.C.1.7
English language learners communicate information, ideas and co ac	**71** **English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.** ELD.K12.ELL.SC.1

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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

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