ALIGNMENT TO THE GEORGIA STANDARDS OF EXCELLENCE FOR SCIENCE

Middle School Science

Grades 6-8

February 2018

Alignment to Georgia Standards of Excellence for Science

Grade 6
Earth Science

Georgia Standards of Excellence	FOSS Alignment
S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.	
a. Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information. (*Clarification statement:* Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the formation of the universe.)	**FOSS Next Generation Planetary Science** Investigation 6, *Beyond the Moon* Planetary Science Investigation Guide (TE), pages 363-422 Planetary Science Science Resources (SE), pages 67-79 Planetary Science Multimedia *Solar System Origin Card Sort* **FOSS Third Edition Motion, Forces, and Models** Science Resources, *Scientists and Models*, pages 44-51
b. Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe.	**FOSS Next Generation Planetary Science** Investigation 6, *Beyond the Moon* Planetary Science Investigation Guide (TE), pages 363-422 Planetary Science Science Resources (SE), pages 67-79 Planetary Science Multimedia *Solar System Origin Card Sort*
c. Analyze and interpret data to compare the planets in terms of : • size relative to Earth • surface and atmospheric features • relative distance from the sun, and • ability to support life	**FOSS Next Generation Planetary Science** Investigation 7, *The Solar System* Planetary Science Investigation Guide (TE), pages 423-490 Planetary Science Science Resources (SE), pages 86-96 Planetary Science Multimedia *Solar System Origin Card Sort*
d. Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.	**FOSS Next Generation Planetary Science** Investigation 6, *Beyond the Moon* Planetary Science Investigation Guide (TE), pages 363-422 Planetary Science Science Resources (SE), pages 80-85 Planetary Science Multimedia *Origin of the Moon*
e. Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids.	**FOSS Next Generation Planetary Science** Investigation 6, *Beyond the Moon* Planetary Science Investigation Guide (TE), pages 363-422 Planetary Science Science Resources (SE), pages 80-85 Planetary Science Multimedia *Origin of the Moon* Investigation 7, *The Solar System* Planetary Science Science Resources (SE), pages 86-96
S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon.	
a. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon.	**FOSS Next Generation Planetary Science** Investigation 4, *Phases of the Moon* Planetary Science Investigation Guide (TE), pages 278-308 Planetary Science Science Resources (SE), pages 42-48 Planetary Science Multimedia Activity, *Lunar Calendar*, *Day/Night Simulation, Phases of the Moon*
b. Construct an explanation of the alignment of the sun, Earth, and moon during solar and lunar eclipses.	**FOSS Next Generation Planetary Science** Investigation 4, *Phases of the Moon* Planetary Science Science Resources (SE), pages 42-48
c. Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.	**FOSS Next Generation Planetary Science** Investigation 2, *Earth/Sun Relationship* Planetary Science Investigation Guide (TE), pages 153-225 Planetary Science Science Resources (SE), pages 15-21 Planetary Science Multimedia Activity, *Seasons*

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Georgia Standards of Excellence	FOSS Alignment
S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes.	
a. Ask questions to determine where water is located on Earth's surface (oceans, rivers, lakes, groundwater, aquifers, and ice), and communicate the relative proportion of water at each location using a circle/pie graph.	**FOSS Next Generation Weather on Earth** Investigation 8, *The Water Planet* Weather and Water Investigation Guide (TE), pages 517-580 (See Part 1) Weather and Water Science Resources (SE), pages 91-95
b. Plan and carry out an investigation to illustrate the role of the sun's energy in atmospheric conditions that lead to the cycling of water. (*Clarification statement:* The water cycle should include evaporation, condensation, precipitation, transpiration, infiltration, groundwater, and runoff.)	**FOSS Next Generation Weather and Water** Investigation 7, *Water in the Air* Weather and Water Investigation Guide (TE), pages 467-516 Weather and Water Science Resources (SE), **Delta Science Module Oceans** Activity 5, *The Water Cycle*, (TE), pages 55-64 *How Do Oceans Affect Weather and Climate* (SE), page 10
c. Ask questions to identify and communicate using graphs and maps the composition, location, and subsurface topography of the world's oceans.	**Delta Science Module Oceans** Activity 4, *Mapping the Ocean Floor*, (TE), pages 43-54 *Features of the Ocean Floor* (SE), pages 4-5
d. Analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides in Earth's systems.	**Delta Science Module Oceans** Activity 6, *Ocean Waves,* (TE), pages 65-74 Activity 7, *Surface Currents,* (TE), pages 75-88 Activity 8, *Density Currents,* (TE), pages 89-98 Activity 9, *Tides* (TE), pages 99-112 *How Does Ocean Water Move?* (SE), pages 7-9 **FOSS Next Generation Weather and Water** Investigation 8, *The Water Planet* Weather and Water Investigation Guide (TE), pages 517-580 (See Parts 2-3, and Extensions) Weather and Water Science Resources (SE), pages 96-102, 103-104 Weather and Water Multimedia, *Tides* and *Perpetual Ocean*
S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.	
a. Analyze and interpret data to compare and contrast the of Earth's atmospheric layers (including the ozone layer) and greenhouse gases. (*Clarification statement:* Earth's atmospheric layers include the troposphere, stratosphere, mesosphere, and thermosphere.)	**FOSS Next Generation Weather and Water** Investigation 1, *What is Weather?* Weather and Water Investigation Guide (TE), pages 93-170 (See Part 3) Weather and Water Science Resources (SE), pages 18-23, 24-31 Investigation 9, *Climate Over Time* Weather and Water Investigation Guide (TE), pages 581-642 (See Part 2) Weather and Water Science Resources (SE), pages 69-75
b. Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to air, land and water at different rates. (*Clarification statement:* Heat transfer should include the processes of conduction, convection and radiation.)	**FOSS Next Generation Weather and Water** Investigation 3, *Convection* Weather and Water Investigation Guide (TE), pages 219-284 Weather and Water Science Resources (SE), pages 41-52 Investigation 4, *Radiation* Weather and Water Investigation Guide (TE), pages 285-346 Investigation 5, *Conduction* Weather and Water Investigation Guide (TE), pages 347-404

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Georgia Standards of Excellence	FOSS Alignment
S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.	
c. Develop a model demonstrating the interaction between unequal heating and the rotation of the Earth that causes local and global wind systems.	**FOSS Next Generation Weather and Water** Investigation 4, *Radiation* Weather and Water Investigation Guide (TE), pages 285-346 Investigation 6, *Air Flow* Weather and Water Investigation Guide (TE), pages 405-466 Weather and Water Science Resources (SE), pages 69-75, 76-84
d. Construct an explanation of the relationship between air pressure, fronts, and air masses and meteorological events such as tornados and thunderstorms.	**FOSS Next Generation Weather and Water** Investigation 1, *What is Weather?* Weather and Water Investigation Guide (TE), pages 93-170 Weather and Water Science Resources (SE), pages 2-17 Weather and Water Multimedia, Video: *Hurricanes and Tornados* Investigation 6, *Air Flow* Weather and Water Investigation Guide (TE), pages 405-466 Weather and Water Science Resources (SE), pages 69-75, 76-84 Investigation 10, *Meteorology* Weather and Water Investigation Guide (TE), pages 643-670 (Part 1) Weather and Water Multimedia, *Weather Maps*
e. Analyze and interpret weather data to explain the effects of moisture evaporating from the ocean on weather patterns and weather events such as hurricanes.	**FOSS Next Generation Weather and Water** Investigation 9, *Climate Over Time* Weather and Water Investigation Guide (TE), pages 581-642 Weather and Water Science Resources (SE), pages 105-110
S6E5. Obtain, evaluate and communicate information to show how Earth's surface is formed.	
a. Ask questions to compare and contrast the Earth's crust, mantle, inner and outer core, including temperature, density, thickness, and composition.	**FOSS Next Generation Earth History** Investigation 5, *Earth's Layers* Earth History Investigation Guide (TE), pages 400-442 Earth History Slide Show, *Earth's Interior*
b. Plan and carry out an investigation of the characteristics of minerals and how minerals contribute to rock composition.	**FOSS Next Generation Earth History** Investigation 5, *Earth's Layers* Earth History Investigation Guide (TE), pages 400-442 Earth History Science Resources Book (SE), *Minerals, Crystals, and Rocks,* pages 68-73
c. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle.	**FOSS Next Generation Earth History** Investigation 3, *Deposition,* Earth History Investigation Guide (TE), pages 246-291 (Sedimentary) Earth History Science Resource Book (SE), *Where in the World Is Calcium Carbonate?,* pages 34-39 Earth History Multimedia Videos, *Sandstone Formation, Shale Formation,* and *Limestone Formation* Earth History Multimedia, *Sedimentary Rocks Tour* Investigation 5, *Earth's Layers* Earth History Investigation Guide (TE), pages 400-442 (Igneous) Earth History Science Resources Book (SE), *Minerals, Crystals, and Rocks,* pages 68-73 Earth History Multimedia Videos, *Extrusive Rock Formation* and *Intrusive Rock Formation* Investigation 7, *Mountains and Metamorphic Rocks* Earth History Investigation Guide (TE), pages 526-583 Earth History Science Resources Book (SE), *Rock Transformations,* pages 88-92; and *How One Rock Becomes Another Rocks,* pages 93 – 98; and *Typical Earth Rocks,* page 179-184 Earth History Multimedia, *Rock Database* Earth History Multimedia Videos, *How Metamorphic Rocks Form*

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Georgia Standards of Excellence	FOSS Alignment
S6E5. Obtain, evaluate and communicate information to show how Earth's surface is formed. (cont.)	
d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. (*Clarification statement:* Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.)	**FOSS Next Generation Earth History** Investigation 2, *Weathering and Erosion,* Earth History Investigation Guide (TE), pages 172-232 Earth History Science Resource Book (SE) , *Grand Canyon Flood,* pages 12-19; *Weathering and Erosion,* pages 20-26; *Modern Sedimentary Environments,* pages 164-165 Earth History Multimedia Videos, *Stream Tables, Debris Flow, Freezing Glass, Frost Wedging,* and *Rock Falls* Investigation 3, *Deposition,* Earth History Investigation Guide (TE), pages 246-292 Earth History Science Resource Book (SE), *Where in the World Is Calcium Carbonate?,* pages 34-39 Earth History Multimedia Videos, *Sandstone Formation, Shale Formation,* and *Limestone Formation* Earth History Multimedia, *Sedimentary Rocks Tour*
e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth.	**FOSS Next Generation Earth History** Investigation 2, *Weathering and Erosion* Earth History Investigation Guide (TE), pages 172-232 Earth History Science Resource Book (SE), *Grand Canyon Flood,* pages 12-19; *Weathering and Erosion,* pages 20-26; *Modern Sedimentary Environments,* pages 164-165 Earth History Multimedia Videos, *Stream Tables, Debris Flow, Freezing Glass, Frost Wedging,* and *Rock Falls* Investigation 3, *Deposition,* Earth History Investigation Guide (TE), pages 246-292 Earth History Science Resource Book (SE), *Where in the World Is Calcium Carbonate?,* pages 34-39 Earth History Multimedia Videos, *Sandstone Formation, Shale Formation,* and *Limestone Formation* Earth History Multimedia, *Sedimentary Rocks Tour*
f. Construct an explanation of how the movement of lithospheric plates (convergent boundary, divergent boundary, transform boundary), called plate tectonics, is due to convection currents below the lithosphere, and can cause major geologic events such as earthquakes and volcanic eruptions.	**FOSS Next Generation Earth History** Investigation 6, *Deposition* Earth History Investigation Guide (TE), pages 462-508 (Parts 2 and 3) Earth History Science Resource Book (SE), *The History of Plate Tectonics,* pages 74-80 Earth History Multimedia Videos, *Plate Tectonics: The Scientist Behind the Theory, Earthquakes Around the World,* and *Volcanoes Around the World* Earth History Multimedia, Google Earth *Plate Boundaries Map* Investigation 7, *Mountains and Metamorphic Rock* Earth History Investigation Guide (TE), pages 526-555 (See Part 1) Earth History Science Resource Book (SE) , *Earth's Dynamic Systems,* pages 81-87 Earth History Multimedia Videos, *Fault Types: Convergent, Divergent, Transform,* and *Folding* Earth History Slide Show, *Mountain Types*

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Georgia Standards of Excellence	FOSS Alignment
S6E5. Obtain, evaluate and communicate information to show how Earth's surface is formed. (cont.)	
g. Construct an argument using maps and data collected to support a claim of how fossils show evidence of the changing surface and climate of the Earth.	**FOSS Next Generation Earth History** Investigation 4, *Fossils and Past Environments* Earth History Investigation Guide (TE), pages 312-381 Earth History Science Resource Book (SE) , *Rocks, Fossils, and Time,* pages 50-63; *Floating on a Prehistoric Sea*, pages 64-67 Investigation 6, *Deposition* Earth History Investigation Guide (TE), pages 246-292 Earth History Science Resource Book (SE), *The History of Plate Tectonics,* pages 74-80
h. Plan and carry out an investigation to provide evidence that soil is composed of layers of weathered rocks and decomposed organic material.	**FOSS Next Generation Earth History** Investigation 2, *Weathering and Erosion* Earth History Investigation Guide (TE), pages 172-232 (See Part 3) Earth History Science Resource Book (SE) , *Soil Stories,* pages 27-33
S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.	
a. Ask questions to determine the differences between renewable/sustainable energy resources (i.e., hydro, solar, wind, geothermal, tidal, and biomass) and nonrenewable energy resources (i.e., nuclear: uranium, and fossil fuels: oil, coal, and natural gas), and how they are used in our everyday lives.	**FOSS Next Generation Earth History** Investigation 8, *Geoscenarios* Earth History Investigation Guide (TE), pages 596-622 Earth History Science Resource Book (SE) , *Geoscenarios,* pages 99-118 Earth History Multimedia, *Geoscenarios* **FOSS Next Generation Planetary Science** Investigation 7, *The Solar System* Planetary Science Science Resources (SE), pages 97-104
b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.	**FOSS Next Generation Weather and Water** Investigation 9, *Climate Change* Earth History Investigation Guide (TE), pages 598-642 (Parts 2 and 3) Earth History Science Resource Book (SE), *Climates: Past, Present, and Future,* pages 105-110 Earth History Video, *Climate Change Basics* **FOSS Next Generation Earth History** Investigation 8, *Geoscenarios,* pages 596-622 Earth History Science Resource Book, *Geoscenarios,* pages 99-118 Earth History Multimedia, *Geoscenarios*
c. Construct an argument evaluating contributions to a rise in global temperatures over the past century. (*Clarification statement:* Tables, graphs, and maps of global and regional temperatures, and atmospheric levels of greenhouse gases such as carbon dioxide and methane, should be used as sources of evidence.)	**FOSS Next Generation Weather and Water** Investigation 9, *Climate Change* Earth History Investigation Guide (TE), pages 598-642 Earth History Science Resource Book (SE), *Climates: Past, Present, and Future,* pages 105-110; See Images and Data section for tables and graphs of climate data, pages 116-117, 120-121, 127-131 Earth History Slide Show, *Earth's Climate Over Time* Earth History Multimedia, *Climate Blog, Greenhouse Gas Simulator, Human-Caused Sources of Carbon Dioxide* Earth History Video, *Carbon Cycle* and *Climate Change Basics*

Alignment to Georgia Standards of Excellence for Science

Grade 7
Life Science

Georgia Standards of Excellence	FOSS Alignment
S7l1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.	
a. Develop and defend a model that categorizes organisms based on common characteristics.	**FOSS Next Generation Diversity of Life** Investigation 1, *What is Life?* Diversity of Life Investigation Guide (TE), pages 95-157 Diversity of Life Science Resources (SE), pages 2-9 Investigation 3, *The Cell* Diversity of Life Investigation Guide (TE), pages 207-282 Diversity of Life Science Resources (SE), pages 14-27 Investigation 4, *Domains* Diversity of Life Investigation Guide (TE), pages 283-374 Diversity of Life Science Resources (SE), pages 28-43 Investigation 5, *Plants, The Vascular System* Diversity of Life Investigation Guide (TE), pages 375-434 Diversity of Life Science Resources (SE), pages 44-57 Investigation 9, *Diversity of Life* Diversity of Life Investigation Guide (TE), pages 593-643 Diversity of Life Science Resources (SE), pages 90-100
b. Evaluate historical models of how organisms were classified based on physical characteristics and how that led to the six kingdom system (currently archaea, bacteria, protists, fungi, plants, and animals). (*Clarification statement:* This includes common examples and characteristics such as, but not limited to, prokaryotic, eukaryotic, unicellular, multicellular, asexual reproduction, sexual reproduction, autotroph, heterotroph, and unique cell structures. Modern classification will be addressed in high school.)	**FOSS Next Generation Diversity of Life** Investigation 3, *The Cell* Diversity of Life Investigation Guide (TE), pages 207-282 Diversity of Life Science Resources (SE), pages 14-27 Investigation 4, *Domains* Diversity of Life Investigation Guide (TE), pages 283-374 Diversity of Life Science Resources (SE), pages 28-43
S7L2. Obtain, evaluate, and communicate information to construct scientific explanations to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.	
a. Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste. (*Clarification statement:* The intent is for students to demonstrate how the component structures of the cell interact and work together to allow the cell as a whole to carry out various processes. Additional structures, beyond those listed, will be addressed in high school Biology.)	**FOSS Next Generation Diversity of Life** Investigation 3, *The Cell* Diversity of Life Investigation Guide (TE), pages 207-282 Diversity of Life Science Resources (SE), pages 14-27 Diversity of Life Multimedia, *Levels of Complexity*
b. Develop and use a conceptual model of how cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.	**FOSS Next Generation Human Systems Interactions** Investigation 1, *Systems Connections* Human Systems Interactions Investigation Guide (TE), pages 71-112 Human Systems Interactions Multimedia, *Levels of Complexity* Human Systems Interactions Multimedia, *Structural Levels Cards* **FOSS Next Generation Diversity of Life** Investigation 3, *The Cell* Diversity of Life Investigation Guide (TE), pages 207-282 Diversity of Life Science Resources (SE), pages 14-27 Diversity of Life Multimedia, *Levels of Complexity*

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Grade 7
Life Science

Georgia Standards of Excellence	FOSS Alignment
S7L2. Obtain, evaluate, and communicate information to construct scientific explanations to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.	
c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes. (*Clarification statement:* The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)	**FOSS Next Generation Human Systems Interactions** Investigation 1, *Systems Connections* Human Systems Interactions Investigation Guide (TE), pages 71-112 Human Systems Interactions Science Resources (SE), pages 2-49 Human Systems Interactions Multimedia, Human Systems *Structural Levels* Investigation 2, *Supporting Cells* Human Systems Interactions Investigation Guide (TE), pages 113-156 Human Systems Interactions Science Resources (SE), pages 50-54 Human Systems Interactions Multimedia, *Digestive and Excretory Systems Video* Human Systems Interactions Multimedia, *Circulatory and Respiratory Systems Video* Human Systems Interactions Multimedia, *Human Cardiovascular System* Investigation 3, *The Nervous System* Human Systems Interactions Investigation Guide (TE), pages 157-249 Human Systems Interactions Science Resources (SE), pages 55-92 Human Systems Interactions Multimedia, Senses Menus Human Systems Interactions Multimedia, *Brain Synapse Function* Human Systems Interactions Multimedia, *Brain Neuron Growth* Human Systems Interactions Multimedia, *Reaction Timer*
S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring.	
a. Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.	**FOSS Next Generation Heredity and Adaptation** Investigation 2, *Heredity* Heredity and Adaptations Investigation Guide (TE), pages 137-231 Heredity and Adaptation Science Resources (SE), pages 17-40 Heredity and Adaptations Multimedia, *Heredity Slide Show*
b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation. (*Clarification statement:* Models could include, but are not limited to, the use of monohybrid Punnett squares to demonstrate the heritability of genes and the resulting genetic variation, identification of heterozygous and homozygous, and comparison of genotype vs. phenotype.)	**FOSS Next Generation Diversity of Life** Investigation 6, *Plant Reproduction and Growth* Diversity of Life Investigation Guide (TE), pages 207-282 Diversity of Life Science Resources (SE), pages 14-27 Diversity of Life Multimedia, *Levels of Complexity* Investigation 7, *Variation of Traits* Diversity of Life Investigation Guide (TE), pages 207-282 Diversity of Life Science Resources (SE), pages 14-27 Diversity of Life Multimedia, *Levels of Complexity* **FOSS Next Generation Heredity and Adaptation** Investigation 2, *Heredity* Heredity and Adaptations Investigation Guide (TE), pages 137-231 Heredity and Adaptation Science Resources (SE), pages 17-40 Heredity and Adaptations Multimedia, *A Model for Predicting Genetic Variation* Heredity and Adaptations Multimedia, *Larkey Impossible Traits* Heredity and Adaptations Multimedia, *Larkey Punnett Square*

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Georgia Standards of Excellence	FOSS Alignment
S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring.	
c. Ask questions to gather and synthesize information about the ways humans influence the inheritance of desired traits in organisms through selective breeding. (*Clarification statement:* The element specifically refers to artificial selection and the ways in which it is fundamentally different than natural selection.)	**FOSS Next Generation Heredity and Adaptation** Investigation 3, *Heredity* Heredity and Adaptations Investigation Guide (TE), pages 233-308 Heredity and Adaptation Science Resources (SE), pages 41-68 Heredity and Adaptations Multimedia, *Genetic Technology Resources*
S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.	
a. Construct an explanation to describe the patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of the ecosystem. (*Clarification statement:* The interactions include, but are not limited to, predator- prey relationships, competition, mutualism, parasitism, and commensalism.)	**FOSS Next Generation Populations and Ecosystems** Investigation 2, *Sorting Out Life* Populations and Ecosystems Investigation Guide (TE), pages 184-227 Populations and Ecosystems Science Resources (SE), pages 13-34 Populations and Ecosystems Multimedia, *Ecoscenarios* Investigation 3, *Mono Lake* Populations and Ecosystems Investigation Guide (TE), pages 246-282 Populations and Ecosystems Science Resources (SE), pages 35-40 Populations and Ecosystems Video, *The Mono Lake Story* Populations and Ecosystems Multimedia, *The Mono Lake Food Web* Investigation 4, *Minihabitats* Populations and Ecosystems Investigation Guide (TE), pages 298-335 Populations and Ecosystems Science Resources (SE), pages 41-50
b. Develop a model to describe the cycling of matter and the flow of energy among biotic and abiotic components of an ecosystem. (*Clarification statement:* Emphasis is on tracing movement of matter and flow of energy, not on the biochemical mechanisms of photosynthesis and cellular respiration.)	**FOSS Next Generation Populations and Ecosystems** Investigation 3, *Mono Lake* Populations and Ecosystems Investigation Guide (TE), pages 246-282 Populations and Ecosystems Science Resources (SE), pages 35-40 Populations and Ecosystems Multimedia, *The Mono Lake Food Web* Investigation 5, *Producers* Populations and Ecosystems Investigation Guide (TE), pages 354-406 Populations and Ecosystems Science Resources (SE), pages 51-55 Investigation 6, *Following the Energy* Populations and Ecosystems Investigation Guide (TE), pages 420-480 Populations and Ecosystems Science Resources (SE), pages 75-86 Populations and Ecosystems Multimedia, *The Mono Lake Food Web*
c. Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems.	**FOSS Next Generation Populations and Ecosystems** Investigation 7, *Population Size* Populations and Ecosystems Investigation Guide (TE), pages 494-546 Populations and Ecosystems Science Resources (SE), pages 87-99 Populations and Ecosystems Multimedia, *Milkweed Bugs* Investigation 8, *Human Impact* Populations and Ecosystems Investigation Guide (TE), pages 562-606 Populations and Ecosystems Science Resources (SE), pages 100-122 Populations and Ecosystems Video, *Hawaii: Strangers in Paradise* and *The Mono Lake Story* Investigation 9, *Ecoscenarios* Populations and Ecosystems Investigation Guide (TE), pages 618-650 Populations and Ecosystems Science Resources (SE), pages 75-86 Populations and Ecosystems Multimedia, *Ecoscenario Research Center*

Georgia Standards of Excellence	FOSS Alignment
S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments. (continued)	
d. Ask questions to gather and synthesize information from multiple sources to differentiate between Earth's major terrestrial biomes (i.e., tropical rain forest, savanna, temperate forest, desert, grassland, taiga, and tundra) and aquatic ecosystems (i.e., freshwater, estuaries, and marine). (Clarification statement: Emphasis is on the factors that influence patterns across biomes such as the climate, availability of food and water, and location.	**FOSS Next Generation Populations and Ecosystems** Investigation 2, *Sorting Out Life* Populations and Ecosystems Investigation Guide (TE), pages 184-227 Populations and Ecosystems Science Resources (SE), pages 13-34 Populations and Ecosystems Multimedia, *Ecoscenarios* Investigation 3, *Mono Lake* (See Part 3) Populations and Ecosystems Investigation Guide (TE), pages 246-282 Populations and Ecosystems Science Resources (SE), pages 35-40 Investigation 9, *Ecoscenarios* Populations and Ecosystems Investigation Guide (TE), pages 618-650 Populations and Ecosystems Science Resources (SE), pages 75-86 Populations and Ecosystems Multimedia, *Ecoscenario Research Center*
S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics.	
a. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (*Clarification statement:* Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.)	**FOSS Next Generation Heredity and Adaptation** Investigation 3, *Heredity* Heredity and Adaptation Investigation Guide (TE), pages 233-308 Heredity and Adaptation Science Resources (SE), pages 41-68 Heredity and Adaptation Multimedia, *Larkey Natural Selection* Heredity and Adaptation Multimedia, Video, *The Making of the Fittest: Natural Selection and Adaptation* Heredity and Adaptation Multimedia, *Walking Sticks*
b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species.	**FOSS Next Generation Heredity and Adaptation** Investigation 3, *Heredity* Heredity and Adaptations Investigation Guide (TE), pages 233-308 Heredity and Adaptation Science Resources (SE), pages 41-68
c. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, and extinction of organisms and their relationships to modern organisms. (*Clarification statement:* Evidence of evolution found in comparisons of current/modern organisms such as homologous structures, DNA, and fetal development will be addressed in high school.)	**FOSS Next Generation Heredity and Adaptation** Investigation 1, *Heredity* Heredity and Adaptations Investigation Guide (TE), pages 73-135 Heredity and Adaptations Science Resources (SE), pages 2-16 Heredity and Adaptations Multimedia, *Biodiversity Slide Show* Heredity and Adaptations Multimedia, *Fossils Slide Show* Heredity and Adaptations Multimedia, Video *Great Transitions: The Origin of the Tetrapod*

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Grade 8
Physical Science

Georgia Standards of Excellence	FOSS Alignment
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter	
a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures. (*Clarification statement:* Include heterogeneous and homogeneous mixtures. Types of bonds and compounds will be addressed in high school physical science.)	**FOSS Next Generation Chemical Interactions** Investigation Guide (TE), Investigation 1, *Substances*, pages 118-149 Investigation Guide (TE), Investigation 2, *Elements*, pages 166-200 Chemical Interactions Science Resources (SE) *Elements,* pages 2-12 *Substances on Earth,* pages 13-14 *Substances in the Universe,* pages 15-23
b. Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed.	**FOSS Next Generation Chemical Interactions** Investigation Guide (TE), Investigation 3, *Particles*, pages 214-257 Chemical Interactions Science Resources (SE) *Particles,* pages 24-27 *Three Phases of Matter,* pages 28-32 Chemical Interactions Multimedia, *Particles in Solids, Liquids, and Gases* Investigation Guide (TE), Investigation 4, *Kinetic Energy*, pages 270-314 Chemical Interactions Science Resources (SE) *Particles in Motion,* pages 33-39 *Expansion and Contraction,* pages 40-45 Investigation Guide (TE), Investigation 5, *Energy Transfer*, pages 330-372 Chemical Interactions Science Resources (SE) *Energy on the Move,* pages 46-55 Chemical Interactions Multimedia, *Energy Flow* Chemical Interactions Multimedia, *Mixing Hot and Cold Water* Chemical Interactions Multimedia, *Thermometer* Investigation Guide (TE), Investigation 6, *Thermos Engineering,* pages 384-415 Chemical Interactions Science Resources (SE) *Engineering a Better Design,* pages 56-63 Investigation Guide (TE), Investigation 8, *Phase Change*, pages 482-539 Chemical Interactions Science Resources (SE) *Rock Solid,* pages 89-100 *Heat of Fusion,* pages 101-109
c. Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical properties of matter (i.e., density, melting point, boiling point).	**FOSS Next Generation Chemical Interactions** Investigation Guide (TE), Investigation 7, *Solutions*, pages 430-466 Chemical Interactions Science Resources (SE) *How Things Dissolve,* pages 64-73 *Concentration,* pages 74-88 Investigation Guide (TE), Investigation 8, *Phase Change*, pages 482-539 Chemical Interactions Science Resources (SE) *Rock Solid,* pages 89-100 *Heat of Fusion,* pages 101-109 Investigation Guide (TE), Investigation 9, *Reaction*, pages 554-623 Chemical Interactions Science Resources (SE) *How Do Atoms Rearrange,* pages 118-129 *Fireworks,* pages 130-133 *Antoine-Laurent Lavoisier,* pages 134-140 Investigation Guide (TE), Investigation 10, *Limiting Factors*, pages 638-656

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Georgia Standards of Excellence	FOSS Alignment
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter	
d. Construct an argument to support the claim that when a change occurs it is either chemical or physical. (*Clarification statement:* Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.)	**FOSS Next Generation Chemical Interactions** Investigation Guide (TE), Investigation 7, *Solutions*, pages 430-466 Chemical Interactions Science Resources (SE) *How Things Dissolve,* pages 64-73 *Concentration,* pages 74-88 Chemical Interactions Multimedia, *Explore Dissolving* Investigation Guide (TE), Investigation 8, *Phase Change*, pages 482-539 Chemical Interactions Science Resources (SE) *Rock Solid,* pages 89-100 *Heat of Fusion,* pages 101-109 Investigation Guide (TE), Investigation 9, *Reaction*, pages 554-623 Chemical Interactions Science Resources (SE) *How Do Atoms Rearrange,* pages 118-129 *Fireworks,* pages 130-133 *Antoine-Laurent Lavoisier,* pages 134-140 Investigation Guide (TE), Investigation 10, *Limiting Factors*, pages 638-656
e. Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (including protons, neutrons, and electrons) and simple molecules.	**FOSS Next Generation Chemical Interactions** Investigation Guide (TE), Investigation 1, *Substances*, pages 118-149 Chemical Interactions Multimedia, *Periodic Table* Investigation Guide (TE), Investigation 2, *Elements*, pages 166-200 Chemical Interactions Science Resources (SE) *Elements,* pages 2-12 Investigation Guide (TE), Investigation 9, *Reaction*, pages 554-623 Chemical Interactions Science Resources (SE) *How Do Atoms Rearrange,* pages 118-129 *Fireworks,* pages 130-133 *Antoine-Laurent Lavoisier,* pages 134-140 **Delta Science Reader Matter and Change** *What Makes Up Matter,* pages 2-8
f. Construct an explanation based on evidence to describe conservation of matter and mass in a chemical reaction including the resulting differences between products and reactants. (*Clarification statement:* Evidence could include models with balanced chemical equations.)	**FOSS Next Generation Chemical Interactions** Investigation Guide (TE), Investigation 9, *Reaction*, pages 554-623 Chemical Interactions Science Resources (SE) *How Do Atoms Rearrange,* pages 118-129 *Fireworks,* pages 130-133 *Antoine-Laurent Lavoisier,* pages 134-140 Investigation Guide (TE), Investigation 10, *Limiting Factors*, pages 638-656
S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.	
a. Analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed and potential energy to mass and height of an object.	**FOSS Next Generation Gravity and Kinetic Energy** Investigation 3, *Energy and Collisions* Investigation Guide (TE), Part 1 *Potential and Kinetic Energy*, page 196-215 Investigation Guide (TE), Part 2 *Stop or Crash*, page 216-225
b. Plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller coasters, pendulums, rubber bands).	**FOSS Next Generation Gravity and Kinetic Energy** Investigation 3, *Energy and Collisions* Investigation Guide (TE), Part 1 *Potential and Kinetic Energy*, page 196-215

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S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system. (cont.)	
c. Construct an explanation about energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)].	**FOSS Next Generation Electromagnetic Force** Investigation 3, *Electromagnetism* Electromagnetic Force Investigation Guide (TE), pages 183-244 (See Parts 2 and 3) Electromagnetic Force Science Resources (SE), pages 38-41, 42-46 Investigation 4, *Energy Transfer* Electromagnetic Force Investigation Guide (TE), pages 245-296 Electromagnetic Force Science Resources (SE), pages 47-55, 56-62
d. Plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection).	**FOSS Second Edition Chemical Interactions** Investigation 4, *Kinetic Energy* Investigation 5, *Energy Transfer* Investigation 6, *Thermos Engineering*
S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.	
a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (*Clarification statement:* Students should be able to analyze motion graphs, but students should not be expected to calculate velocity or acceleration.)	**FOSS Next Generation Gravity and Kinetic Energy** Investigation 1, *Acceleration* Gravity and Kinetic Energy Investigation Guide (TE), pages 67-135 Gravity and Kinetic Energy Science Resources (SE), pages 11-17, 18-25 Gravity and Kinetic Energy Science Resources (SE), pages 26-30
b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.	**FOSS Next Generation Electromagnetic Force** Investigation 1, *What is Force?* Electromagnetic Force Investigation Guide (TE), pages 71-125 (See Part 3) Electromagnetic Force Science Resources (SE), pages 8-14, 15-18 **FOSS Next Generation Gravity and Kinetic Energy** Investigation 2, *Force of Gravity* Gravity and Kinetic Energy Investigation Guide (TE), pages 137-184 Investigation 3, *Energy and Collisions* Science Resources, pages 45-49
c. Construct an argument from evidence to support the claim that heavier objects require a greater force to accelerate (inertia).	**FOSS Next Generation Electromagnetic Force** Investigation 1, *What is Force?* Electromagnetic Force Investigation Guide (TE), pages 71-125 (See Part 3) Electromagnetic Force Science Resources (SE), pages 8-14, **FOSS Next Generation Gravity and Kinetic Energy** Investigation 3, *Energy and Collisions* Gravity and Kinetic Energy Investigation Guide (TE), Part 1 *Potential and Kinetic Energy*, page 196-215 Gravity and Kinetic Energy Investigation Guide (TE), Part 2 *Stop or Crash*, page 216-225 Gravity and Kinetic Energy Science Resources (SE), pages 37-40
S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.	
a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves. (*Clarification statement:* Include transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions.)	**FOSS Next Generation Waves** Investigation 2, *Wave Energy* Waves Investigation Guide (TE), pages 113-175 Waves Science Resources (SE), page 81 Investigation 3, *Light Waves* Waves Investigation Guide (TE), pages 177-243

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S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.	
b. Construct an explanation using data to illustrate the relationship between the electromagnet spectrum and energy.	**FOSS Next Generation Waves** Investigation 3, *Light Waves* Waves Investigation Guide (TE), pages 177-243 Waves Science Resources (SE), pages 32-41, 82
c. Obtain, evaluate, and communicate information to explain practical applications of the electromagnetic spectrum (e.g., communication, medical, military).	**FOSS Next Generation Waves** Investigation 4, *Communication Waves* Waves Investigation Guide (TE), pages 245-295 Waves Science Resources (SE), pages 58-78
d. Develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted, or transmitted through various materials. (*Clarification statement:* Include echo and how color is seen but not interference and scattering.)	**FOSS Next Generation Waves** Investigation 1, *Make Waves* Waves Investigation Guide (TE), pages 79-112 Waves Science Resources (SE), page 81 Investigation 2, *Wave Energy* Waves Investigation Guide (TE), pages 113-175 Waves Science Resources (SE), pages 17-27 Investigation 3, *Light Waves* Waves Investigation Guide (TE), pages 177-243 Waves Science Resources (SE), pages 28-31, 49-53, 54-57 Waves Multimedia, *Refraction*
e. Analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed).	**FOSS Next Generation Waves** Investigation 3, *Light Waves* Waves Investigation Guide (TE), pages 177-243
f. Develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, and wavelength) and energy.	**FOSS Next Generation Waves** Investigation 1, *Make Waves* Waves Investigation Guide (TE), pages 79-112 (See Part 2) Investigation 2, *Wave Energy* Waves Investigation Guide (TE), pages 113-175 (See Part 3) Waves Science Resources (SE), pages 2-6 Waves Multimedia, *Oscilloscope* Investigation 3, *Light Waves* Waves Investigation Guide (TE), pages 177-243 Waves Science Resources (SE), pages 32-41, 82, 84
g. Develop and use models to demonstrate the effects and functions of lenses.	**FOSS Next Generation Waves** Investigation 3, *Light Waves* Waves Investigation Guide (TE), pages 177-243 (See Part 4)

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S8P5. Obtain, evaluate, and communicate information about the phenomena of gravity, electricity, and magnetism as major forces acting in nature.	
a. Construct an argument using evidence to support the claim that fields (i.e., magnetic fields, gravitational fields, and electric fields) exist between objects exerting forces on each other even when the objects are not in contact.	**FOSS Next Generation Electromagnetic Force** Investigation 1, *What is Force* Electromagnetic Force Science Resources (SE), pages 2-7, 8-14 Investigation 2, *The Force of Magnetism* Electromagnetic Force Investigation Guide (TE), pages 127-181 Electromagnetic Force Science Resources (SE), pages 19-24 Investigation 3, *Electromagnetism* Electromagnetic Force Investigation Guide (TE), pages 183-244 (See Parts 2 and 3) Electromagnetic Force Science Resources (SE), pages 38-41, 42-46 **FOSS Next Generation Gravity and Kinetic Energy** Investigation 1, *Acceleration* Gravity and Kinetic Energy Investigation Guide (TE), pages 67-135 Gravity and Kinetic Energy Science Resources (SE), pages 18-25 Investigation 2, *Force of Gravity* Gravity and Kinetic Energy Investigation Guide (TE), pages 137-184 Gravity and Kinetic Energy Science Resources (SE), pages 31-36
b. Plan and carry out investigations to demonstrate the distribution of charge in conductors and insulators. (*Clarification statement:* Include conduction, induction, and friction.)	**FOSS Next Generation Electromagnetic Force** Investigation 3, *Electromagnetism* Electromagnetic Force Investigation Guide (TE), pages 183-244 (See Part 1) Electromagnetic Force Science Resources (SE), pages 25-30, 31-37, 42-46
c. Plan and carry out investigations to identify factors (e.g., distance between objects, magnetic force produced by an electromagnet with varying number of wire turns, varying number or size of dry cells, and varying size of iron core) that affect the strength of electric and magnetic forces. (*Clarification statement:* The investigations included, but are not limited to, generators or motors.)	**FOSS Next Generation Electromagnetic Force** Investigation 3, *Electromagnetism* Electromagnetic Force Investigation Guide (TE), pages 183-244 (See Parts 2 and 3) Electromagnetic Force Science Resources (SE), pages 38-41, 42-46