2023 Alabama Course of Study Correlations

Kindergarten Science Content Standards

FOSS FULL OPTION SCIENCE SYSTEM™

Next Generation Curriculum

Motion and Stability: Forces and Interactions	**FOSS Module** **Investigation Part that addresses standard**
Changes in Motion	
1. Plan and carry out investigations to determine the effects of forces of different strengths and directions on the motion of an object, including speed, direction, and distance traveled. *Examples: pushing, pulling, or crashing objects*	Materials and Motion: Investigation 4 Parts 1-4
2. Analyze data from investigations to determine whether a design solution provides sufficient force to change the speed or direction of an object. *Example: constructing a ramp to increase or decrease the speed of a moving object*	Materials and Motion: Investigation 4 Parts 1-4
Ecosystems: Interactions, Energy, and Dynamics	**FOSS Module** **Investigation Part that addresses standard**
Structures and Processes	
3. Use data from observations to distinguish characteristics of living and nonliving things.	Animals Two by Two Investigation 1 Part 2;

	Investigation 2 Part 1; Investigation 3 Part 2; Investigation 4, Part 1 Trees and Weather Investigation 1 Part 6
4. Use observations to determine patterns of what plants and animals (including humans) need to survive, including light, water, and nutrients.	Animals Two by Two Investigation 2 Parts 1 and 3; Investigation 3 Part 1 and 3; Investigation 4 Part 1-4 Trees and Weather Investigation 1 Part 1
Interdependent Relationships	
5. Gather information from observations and media to explain how plants and animals can provide for their needs by changing their environment. *Examples: tree roots breaking a sidewalk to provide space, red fox burrowing to create a den to raise young, humans growing gardens for food and building roads for transportation, birds and beavers using available materials to construct their homes*	Animals Two by Two Investigation 1 Parts 2 and 3; Investigation 2 Part 3; Investigation 3 Part 2 Trees and Weather Investigation 1 Parts 1 and 5; Investigation 4 Parts 1-5
6. Use models of natural habitats to represent the interdependence among plants and animals native to their community. *Examples: school garden, terrarium, aquarium, classroom animal habitat (worms, geckos, butterflies), virtual habitat models*	Animals Two by Two Investigation 1 Part 3; Investigation 3 Part 2

	Trees and Weather Investigation 1 Parts 2-3
Earth's Systems	**FOSS Module** **Investigation Part that addresses standard**
Energy Transfer	
7. Make observations and describe the effects of sunlight on Earth's surface. *Examples: evaporation of water or increased temperature of soil, rocks, and sand caused by direct and indirect sunlight*	Trees and Weather Investigation 3 Parts 1-2
8. Design, construct, and test a device to reduce the effects of sunlight. *Examples: hat, canopy, umbrella, tent*	Materials and Motion Investigation 3 Part 6
Weather	
9. Observe, record, and communicate local weather patterns over a period of time. *Examples: daily increase in temperature from morning to afternoon, typical rain and storm patterns from season to season*	Trees and Weather Investigation 3 Parts 1-3
10. Obtain, evaluate, and communicate information about using weather forecasts to make plans and prepare for severe weather	Trees and Weather Investigation 3 Part 3
Earth and Human Activity	**FOSS Module** **Investigation Part that addresses standard**
Human Impact	
11. Identify a problem and design possible solutions that lessen the human impact on the local environment. *Examples: Notice trash accumulating on the playground and come up with a plan to*	Materials and Motion Investigation 2 Part 4

address it; observe gravel washing from a driveway onto a grassy area and create a barrier to keep the rocks in place	

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Grade One Science Content Standards

Next Generation Curriculum

Waves and Their Applications in Technologies for Information Transfer	**FOSS Module** **Investigation Part that addresses standard**
Wave Properties	
Carry out investigations to provide evidence that the vibrations of matter can make sound and sound can make matter vibrate. *Examples: striking a tuning fork, plucking a guitar string, holding a piece of paper near a sound system speaker*	Sound and Light Investigation 1 Parts 1-3; Investigation 2 Parts 1-4
Use evidence from observations to explain that light is necessary in order for an object to be seen.	Sound and Light Investigation 3 Parts 1-3; Investigation 4 Part 3
Plan and carry out investigations to determine how light is affected when it interacts with various types of materials. *Examples: transparent, translucent, opaque, reflective*	Sound and Light Investigation 3 Part 3; Investigation 4 Parts 1 and 4

Design and construct a device that uses light or sound waves to send a communication signal over a distance. *Examples: using a light or a sound to communicate an action or a warning*	<u>Sound and Light</u> Investigation 2 Part 4; Investigation 4 Part 4
From Molecules to Organisms: Structures and Processes	**<u>FOSS Module</u>** **Investigation Part that addresses standard**
External Structures	
Use information from observations to explain how various external features help living things survive, grow, and meet their needs. *Examples: a rose's thorns, a giraffe's long neck*	<u>Plants and Animals</u> Investigation 1 Parts 1-4; Investigation 2 Parts 1-3; Investigation 3 Parts 1 and 3; Investigation 4 Parts 1-3
Growth and Development	
Obtain information from text and other media to provide evidence that parents and their offspring engage in patterns of behavior that help the offspring survive. *Examples: Offspring send signals such as crying or other vocalization and the parent responds by comforting, feeding, and protecting the offspring.*	<u>Plants and Animals</u> Investigation 3 Part 3; Investigation 4 Part 3
Heredity: Inheritance and Variation of Traits	**<u>FOSS Module</u>** **Investigation Part that addresses standard**
Inherited Traits and Environmental Impact	
Make observations to identify the similarities and differences between offspring and their parents. *Examples: flowers from the same kind of plant being the same shape, but differing in size; dog being same breed as parent, but differing in fur color or pattern*	<u>Plants and Animals</u> Investigation 4 Parts 2-3

Earth's Place in the Universe	**FOSS Module** **Investigation Part that addresses standard**
Sun, Moon, and Stars	
Observe, describe, and predict patterns of the sun, moon, and stars as they appear in the sky.	Air and Weather Investigation 2 Parts 1-4; Investigation 4 Parts 1-3
Use observations of seasonal sunrise and sunset patterns to describe the relationship between the number of hours of daylight and the time of year.	Air and Weather Investigation 4 Parts 1-3

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Grade Two Science Content Standards

Next Generation Curriculum

Matter and Its Interactions	**FOSS Module** **Investigation Part that addresses standard**
Structure and Properties	
Plan and carry out investigations to compare, contrast, and classify various solid and liquid materials according to physical properties, including color and texture.	Solids and Liquids Investigation 1: Parts 1-5; Investigation 2 Parts 1-3 Pebbles, Sand and Silt Investigation 1 Parts 1-5
Conduct investigations to determine suitable uses of natural and manufactured materials based on their observable properties, including strength, flexibility, hardness, absorbency, and texture.	Solids and Liquids Investigation 1 Parts 1-2 Pebbles, Sand and Silt Investigation 1 Parts 1 and 5
Physical and Chemical Changes	

Demonstrate and explain how structures made from a small set of pieces can be disassembled and then reassembled as new and different structures.	Solids and Liquids Investigation 1 Part 4
Provide evidence that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible.	Solids and Liquids Investigation 4 Part 4
Ecosystems: Interactions, Energy, and Dynamics	**FOSS Module** **Investigation Part that addresses standard**
Interdependent Relationships	
Plan and carry out an investigation, using one variable at a time, to determine how each variable affects plant growth. *Examples: various amounts of light, various amounts of water*	Insects and Plants Investigation 2 Part 2
sign and construct models to simulate how animals disperse seeds or pollinate plants.	Insects and Plants Investigation 5 Part 4
Biodiversity	
Obtain information to explain that there are many different kinds of living things that exist in habitats on land and in water.	Insects and Plants Investigation 1 Parts 1-3; Investigation 3 Part 4; Investigation 4 Part 4
Earth's Systems	**FOSS Module** **Investigation Part that addresses standard**
Physical Features	
Use models to distinguish between the shapes and kinds of land and water on Earth. *Examples: rivers, oceans, mountains, valleys*	Pebbles, Sand and Silt Investigation 4 Parts 3-4

Water	
Obtain information to identify where water is found on Earth and determine whether it is a solid or a liquid.	Pebbles, Sand and Silt Investigation 4 Parts 3
Changes Over Time	
Use a variety of sources to provide evidence that Earth's events can occur slowly or rapidly. *Examples: erosion, melting of glaciers; earthquakes, volcanic eruptions*	Pebbles, Sand and Silt Investigation 1 Parts 1-2; Investigation 2 Part 4
Human Impact	
aluate multiple solutions designed to slow or prevent wind or water from changing the shape of Earth's surface. *Examples: the use of dams and erosion prevention methods*	Pebbles, Sand and Silt Investigation 4 part 4

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Grade Three Science Content Standards

Next Generation Curriculum

Motion and Stability: Forces and Interactions	**FOSS Module** **Investigation Part that addresses standard**
Changes in Motion	
Conduct investigations to explain the effects of balanced and unbalanced forces exerted on an object, varying the size, number, and direction of the forces. *Examples: balanced forces pushing from both sides of an object, such as a box, producing no motion; unbalanced force on one side of an object, such as a ball, producing motion*	Motion Investigation 3 Parts 1-4
Observe and measure an object's motion to provide evidence that a pattern of motion can be used to predict future motion. *Examples: a child swinging on a swing, a ball rolling back and forth in a bowl, two children going up and down on a seesaw, a model vehicle rolling down ramps of varying heights, a swinging pendulum*	Motion Investigation 1 Parts 2-3; Investigation 2 Parts 1-3
Non-Contact Forces	
Conduct investigations to determine cause and effect relationships between objects not in contact with one another, including magnetic and electrostatic forces.	Motion Investigation 1 Parts 1-3

Examples: the force on hair from an electrically charged balloon, the attraction of the plastic wrap to your hand after you remove it from a package, force between two permanent magnets at a distance, force between two magnets and steel paper clips	
Apply scientific ideas about magnetic interactions to solve a problem using the engineering design process. *Examples: constructing maglev systems, constructing a latch to keep a door shut*	Motion Investigation 3 Part 4
From Molecules to Organisms: Structures and Processes	**FOSS Module** **Investigation Part that addresses standard**
Growth and Development	
Develop and use models to compare the diverse life cycles of organisms other than humans, including birth, growth, reproduction, and death. *Examples: flowering plants, frogs, butterflies*	Structures of Life Investigation 1 Parts 1-3; Investigation 2 Parts 1-2; Investigation 3
Heredity: Inheritance and Variation of Traits	**FOSS Module** **Investigation Part that addresses standard**
Inherited Traits and Environmental Impact	
Use data to provide evidence that plants and animals have observable traits inherited from parents and that variations of these traits exist in groups of similar organisms. *Examples: dogs and their offspring have fur and four legs, pine trees and their offspring have needles*	Structures of Life Investigation 2 Parts 1-2
Use evidence to support a claim that traits can be influenced by the environment. *Examples: insufficient nutrients leads to stunted growth in plants and animals; acid in the soil determines the color of the hydrangea blooms; a flamingo's diet determines the color of its feathers*	Structures of Life Investigation 2 Part 2

Unity and Diversity	**FOSS Module** **Investigation Part that addresses standard**
Fossil Evidence	
Analyze and interpret data from fossils to provide evidence of the existence of organisms and information about the environments in which they lived. *Examples: marine fossils on dry land, tropical plant fossils in arctic areas, fossils of extinct organisms in any environment*	Structures of Life Investigation 4 Part 2
Biodiversity	
Construct an explanation from evidence of how variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. *Examples: plants having larger thorns being less likely to be eaten by predators, animals having better camouflage coloration being more likely to survive and bear offspring*	Structures of Life Investigation 4 Part 1
Make a claim from evidence that an organism's likelihood of survival depends upon access to sufficient resources in its habitat, including sunlight, air, water, food, and shelter.	Structures of Life Investigation 3 Part 2; Investigation 4 Parts 1-2
Construct explanations of how forming groups helps some organisms survive. *Example: quail form coveys to provide protection for their young*	Structures of Life Investigation 3 Part 3
Human Impact	
Obtain and communicate information regarding the impact of existing solutions on plant and animal populations when environmental changes occur. *Examples: creating barriers in coastal areas to protect sea oats from destruction by hurricanes, trapping and relocating beavers whose dam causes flooding, reseeding a forest following wildfires, cutting a fire break or burning underbrush to contain a wildfire*	Structures of Life Investigation 4 Part 1
Earth's Systems	**FOSS Module** **Investigation Part that addresses standard**

Weather	
Represent data in tables or graphical displays to reveal typical weather patterns during a particular season. *Examples: line graphs of precipitation, bar graphs of wind direction, line plots of temperature*	Water and Climate Investigation 2 Parts 1-2
Climate	
Use information from a variety of sources to describe climates in different regions of the world.	Water and Climate Investigation 4 Part 2
Earth and Human Activity	**FOSS Module** **Investigation Part that addresses standard**
Natural Hazard Solutions	
Obtain and communicate information on the effectiveness of existing solutions designed to reduce the impact of weather-related hazards. *Examples: flood barriers, wind-resistant roofs, tornado warning sirens, hurricane shutters, tornado shelters, weather alert apps on a phone*	Water and Climate Investigation 3 Part 4

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Grade Four Science Content Standards

FOSS FULL OPTION SCIENCE SYSTEM™

Pathways Curriculum

Energy	**FOSS Module** **Investigation Part that addresses standard**
Speed and Energy	
Use evidence to explain the relationship between the speed of an object and its energy.	Energy Investigation 3 Parts 1-2
Transference of Energy	
Plan and carry out investigations to answer questions regarding changes in energy when objects collide, and predict reasonable outcomes based on observed patterns. *Examples: marbles rolling down a ramp and colliding with each other, chain reactions with dominoes*	Energy Investigation 3 Part 2
Plan and carry out investigations to provide evidence that energy is transferred by sound, light, heat, and electric currents. *Examples: creating an electric circuit that requires a complete loop* a. Construct an explanation using evidence to support the claim that	Energy Investigations 1 Parts 1-3; Investigation 2 Parts 1-3

heat can be produced in many ways. *Examples: rubbing hands together, burning leaves* b. Construct an explanation with evidence supporting the claim that different objects can absorb, reflect, and/or conduct energy	
Design, construct, and test a device that changes energy from one form to another. *Examples: electric circuits converting electrical energy into motion, light, or sound energy; a passive solar heater converting light energy into heat energy*	Energy Investigations 1 Parts 2-3; Investigation 2 Parts 1-2
Waves and Their Applications in Technologies for Information Transfer	**FOSS Module** **Investigation Part that addresses standard**
Wave Properties	
Develop and use models to describe amplitude and wavelength patterns and how waves can cause objects to move.	Energy Investigation 4 Part 2
Information Transfer	
Construct an explanation of how light, sound, and digitized information are transferred by waves. *Examples: using a grid of 1s and 0s representing black and white to send information about a picture, using drums to send coded information through sound waves, and using Morse code to send a message*	Energy Investigation 4 Part 2
Wave Properties	
Develop a model to demonstrate that light reflecting from objects and entering the eyes allow objects to be seen. *Example: light reflecting off an apple and back into the eye*	Energy Investigation 4 Part 1
From Molecules to Organisms: Structures and	**FOSS Module**

Processes	**Investigation Part that addresses standard**
Internal and External Structures	
Make a claim, using evidence, that the functions of both internal and external structures of plants and animals (including humans) support growth, survival, and behavior. *Examples: In plants, thorns provide protection and stems transport nutrients; in animals, heart pumps blood and skin provide protection.* ***Clarification: The emphasis is on the function of individual structures***	Senses and Survival Investigation 1 Parts 1-2; Investigation 2 Parts 1-2; Investigation 3 Parts 1-2
Information Processing	
Carry out investigations to support a claim that different animals receive information through their senses, process that information, and respond in various ways. *Examples: earthworms tunneling into the soil to avoid light, frogs jumping when startled, dogs moving their ears when reacting to sound*	Senses and Survival Investigation 1 Parts 1-3; Investigation 2 Part 2
Earth's Systems	**FOSS Module** **Investigation Part that addresses standard**
Water	
Develop and use a model to describe how water moves through Earth's systems by the processes of evaporation, condensation, and precipitation.	Earth and Sun Investigation 2 Part 1 Water and Climate Investigation 3 Part 3
Changes Over Time	
Construct explanations of Earth's changes over time through slow and rapid processes, citing evidence found in rock formations and fossils in rock layers. *Examples: rock layers containing shell fossils appearing above rock layers containing plant fossils but no shells, indicating a change from land to water over time; a canyon with rock layers in the walls and a river in the bottom, indicating that over time a*	Soils, Rocks and Landforms Investigation 4 Part 2

river cut through the rock	
Plan and carry out investigations to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, and vegetation, investigating a single form of weathering or erosion at a time. *Examples: angle of slope in downhill movement of water flow, cycles of freezing and thawing of water, cycles of heating and cooling water, speed of wind, relative rate of soil deposition, amount of vegetation compared to rate of erosion*	Soils, Rocks and Landforms Investigation 1 Parts 1-2; Investigation 2 Parts 1-3
Physical Features	
Analyze and interpret data from maps to describe patterns of Earth's features on land and in the ocean. *Examples: topographic maps of Earth's land and ocean floor; maps of mountains, continental boundaries, volcanoes, and earthquakes*	Soils, Rocks and Landforms Investigation 3 Parts 1-2; Investigation 4 Part 1
Earth and Human Activity	**FOSS Module** **Investigation Part that addresses standard**
Natural Resources	
Gather information to describe how the use of energy derived from renewable and nonrenewable resources affects the environment. *Examples: Constructing dams harnesses energy from water and changes animal habitats. Burning fossil fuels creates energy and creates air pollution.*	Energy Investigation 1 Part 2
Natural Hazard Solutions	
Design, test, and evaluate a solution that will protect humans from the effects of natural Earth processes. *Examples: designing buildings to resist earthquakes, tornados, or hurricanes; improving monitoring of volcanic activity*	Soils, Rocks and Landforms Investigation 2 Part 3; Investigation 3 Part 2

2023 Alabama Course of Study Correlations

Grade Five Science Content Standards

FOSS FULL OPTION SCIENCE SYSTEM™

Pathways Curriculum

Matter and Its Interactions	**FOSS Module** **Investigation Part that addresses standard**
Structure and Properties	
Plan and carry out investigations to provide evidence that matter is made of particles too small to be seen. *Examples: adding air to expand a basketball, dissolving sugar into water*	Mixtures and Solutions Investigation 1, Parts 1–3; Investigation 2, Parts 1–2
Analyze data collected through observations and measurements to identify materials based on their properties, including color, hardness, and reflectivity.	Mixtures and Solutions Investigation 3, Parts 1–3
Physical and Chemical Changes	
Conduct investigations to provide evidence that the total weight of matter is conserved during phase changes when substances are heated, cooled, or mixed. *Examples: melting a cube of ice in a cup of water; dissolving sugar in*	Mixtures and Solutions Investigation 1, Part 2

hot water; placing a warm water bottle in the refrigerator	Investigation 4, Parts 1–2
Analyze data from tests to determine whether a new substance is formed after two or more substances are combined. *Examples: mixing vinegar and baking soda, sand and water*	Mixtures and Solutions Investigation 4, Parts 1–2
Motion and Stability: Forces and Interactions	**FOSS Module** **Investigation Part that addresses standard**
Non-Contact Forces	
Make a claim, supported by evidence, that the gravitational force exerted by Earth pulls objects towards the center of Earth.	Earth and Sun Investigation 4, Part 1
Design and conduct a test to modify the speed of an object falling due to gravity. *Example: constructing a parachute to slow the speed of a falling object*	Motion Investigation 2 Part 3
Ecosystems: Interactions, Energy, and Dynamics	**FOSS Module** **Investigation Part that addresses standard**
Matter and Energy Flow	
Support an argument from evidence that plants primarily use air and water to process matter needed for growth.	Living Systems Investigation 2, Part 1
Use evidence to explain that energy from the sun is present in animals' food and is used for body repair, growth, motion, and maintenance of body warmth.	Living Systems Investigation 2, Part 1-2
Create and use a model to explain the transfer of matter and energy between the environment and organisms within it.	Living Systems

Examples: producers, consumers, scavengers, decomposers	Investigation 1, Parts 1–2; Investigation 3, Parts 1–3; Investigation 4, Part 1
Earth's Place in the Universe	**FOSS Module** **Investigation Part that addresses standard**
Sun, Moon, and Stars	
Obtain and communicate information to explain why the sun appears to be larger and brighter than other stars.	Earth and Sun Investigation 4, Parts 2–3
Analyze data that reveal patterns of daily changes in length and direction of shadows, day and night, phases of the moon, and seasonal appearance of some stars in the night sky.	Earth and Sun Investigation 3, Parts 1–2; Investigation 4, Parts 2–3
Earth's Systems	**FOSS Module** **Investigation Part that addresses standard**
System Interactions	
Use a model to represent how any two of Earth's systems (atmosphere, biosphere, geosphere, and hydrosphere) interact and support life. *Example: impact of the ocean (hydrosphere) on ecosystems and landforms (geosphere); impact of mountain ranges (geosphere) on weather (atmosphere)*	Earth and Sun Investigation 1, Part 2; Investigation 2, Part 1
Water	

Construct a model to represent the distribution of freshwater and saltwater on Earth. *Example: graphical display representing the percentages of fresh and saltwater amounts*	<u>Earth and Sun</u> Investigation 2, Part 1
Earth and Human Activity	**<u>FOSS Module</u>** **Investigation Part that addresses standard**
Human Impact	
Obtain and evaluate information to communicate how science-based solutions are being used to protect Earth's natural resources and its environment. *Examples: terracing land to prevent soil erosion, recycling to reduce overuse of landfill areas*	<u>Earth and Sun</u> Investigation 2, Part 2
Design, test, and revise solutions to clean a polluted environment. *Examples: simulating a solution to an oil spill in the ocean, simulating using plants to clean contaminated environments (phytoremediation)*	<u>Mixtures and Solutions</u> Investigation 1, Parts 1–3

2023 Alabama Course of Study Correlations

Grade 6 Earth and Space Science Content Standards

Next Generation Curriculum

Earth's Place in the Universe	**FOSS Module** **Investigation Part that addresses standard**
Sun, Earth, and Moon	
Manipulate models to demonstrate the patterns of motion of the sun, Earth, and moon. a. Construct an evidence-based explanation of how the relative positions of the sun and Earth result in observable phenomena, including day and night cycles, length of year, and seasons. b. Construct an evidence-based explanation of how the relative positions of the sun, moon, and Earth result in observable phenomena, including lunar cycles, eclipses, and tidal cycles	Planetary Science Investigation 1 Part 3; Investigation 2 Parts 1-3; Investigation 3 Parts 1 and 2; Investigation 4 Parts 1-3
The Solar System and the Universe	
Evaluate information to compare and contrast past and current views about the structure of the universe and show how these views have changed over time. *Example: structure of the solar system (heliocentric vs. geocentric)*	Planetary Science Investigation 8 Part 2
Construct an evidence-based explanation of the role of gravity on the movement	Planetary Science

of natural and manmade objects within galaxies and the solar system. *Examples: planets, moons, comets, asteroids, meteors, satellites*	Investigation 1 Part 3; Investigation 6 Parts 1 and 2
Analyze and use data to determine scale properties and characteristics of objects in the solar system including sizes, distances, orbital periods, basic composition, and ability to support life.	<u>Planetary Science</u> Investigation 2 Parts 1-3; Investigation 3 Parts 1 and 2; Investigation 5 Part 1; Investigation 6 Parts 1 and 2; Investigation 7 Parts 1-4; Investigation 9 Part
Earth's Systems: Materials and Processes	**<u>FOSS Module</u> Investigation Part that addresses standard**
Earth's Processes	
Obtain, evaluate, and communicate evidence that explains how constructive and destructive processes shape Earth's surface. a. Develop and use models to demonstrate the processes that form rocks and cycle Earth's materials. *Examples: crystallization, heating and cooling, weathering and erosion* b. Construct an evidence-based explanation of how rocks are classified as metamorphic, igneous, or sedimentary based on their characteristics and the process of the rock cycle. c. Develop and use models to demonstrate types of weathering, effects of agents of erosion and transportation, and the formation of environments of deposition. *Examples: physical and chemical weathering; water, wind, ice, and vegetation; deltas, alluvial fans, sand dunes*	<u>Earth History</u> Investigation 1 Parts 1-3; Investigation 2 Parts 1 –2; Investigation 3 Parts 1-3; Investigation 5 Parts 1-3; Investigation 7 Part 2

d. Use research-based evidence to propose a scientific explanation of how the distribution of Earth's resources, including minerals, fossil fuels, and groundwater, results from ongoing geoscience processes.	
Plate Tectonics	
Construct an evidence-based explanation of how tectonic plate movement impacts Earth's surface over geological time. *Examples: formation of canyons, caverns, volcanic island chains* a. Construct an evidence-based explanation of how Earth's internal energy flows between its surface and its interior. *Examples: transfer of heat from the core to crust; convection currents due to differences* in density b. Construct a scientific explanation of how the movement of lithospheric plates can cause major geologic events and form Earth's surface features, including convergent, divergent, and transform boundaries; earthquakes; and volcanoes. c. Provide evidence of past plate movements, using data regarding the distribution of fossils, rocks, continental shapes, and seafloor structures.	Earth's History Investigation 1 Parts 1-3; Investigation 3 Parts 1-3; Investigation 4 Parts 1-3; Investigation 5 Parts 1-3; Investigation 6 Parts 1-3; Investigation 7 Parts 1 and 2; Investigation 9 Parts 1 and 2
Analyze data from rock strata and the fossil record to construct a chronology of occurrences in Earth's history. *Examples: fossil evidence, sedimentary rock layers, impact craters, and volcanic eruptions*	Earth's History Investigation 1 Parts 1-3; Investigation 4 Parts 1-3; Investigation 9 Parts 1 and 2
Earth's Systems: Energy and Weather	**FOSS Module** **Investigation Part that addresses standard**
Energy Transfer	
Construct an evidence-based explanation of how the sun's energy drives the motion and cycling of water through the hydrosphere.	Weather and Water Investigation 1 Part 1;

a. Plan and carry out an investigation to determine the differences in rates of energy transfer from the sun to air, to land, and to water via conduction, convection, and radiation. b. Develop and use a model that illustrates how differences in heat and pressure affect density and the relationship between density and convection.	Investigation 2 Parts 1 and 2; Investigation 3 Parts 1-3; Investigation 4 Parts 2-3; Investigation 7 Parts 2 and 3; Investigation 8 Parts 1-3
Weather	
Use data analysis to monitor and predict weather changes and the impact of weather events, including severe weather. *Example: Track and analyze temperature and barometric pressure data collected for the local area to identify trends that result in weather changes and use this analysis to predict future weather events in the area.* a. Obtain, evaluate, and communicate data that describes characteristics of air masses, including temperature, pressure, and humidity. Examples: weather maps, diagrams, radar, and computer simulations b. Construct an explanation of how air pressure, weather fronts, and air masses are related to weather events. c. Design solutions to mitigate the impact of severe weather. *Examples: storm shelter, action plan, weather monitoring tools*	<u>Weather and Water</u> Investigation 1 Parts 1 and 3; Investigation 2 Parts 1 and 2; Investigation 3 Part 3; Investigation 6 Part 3; Investigation 7 Part 3; Investigation 9 Parts 1-3; Investigation 10 Parts 1-2
Climate	
Use observations and data from investigations to demonstrate how the sun, air, land, and water affect Earth's climate. *Examples: simulations of convection in the atmosphere and ocean, comparisons of how soil and water absorb heat* a. Develop models demonstrating how unequal heating and the rotation of the Earth cause local and global wind systems and oceanic currents. b. Construct explanations of how the tilt and curvature of the Earth cause unequal heating of its surface, resulting in regional climates based on patterns of latitude.	<u>Weather and Water</u> Investigation 1 Parts 1 and 3; Investigation 3 Part 3; Investigation 4 Parts 1 and 3 Investigation 6 Part 3; Investigation 8 Parts 1-3;

c. Construct an explanation of how altitude, geothermal activity, and oceanic distribution of heat produce typical regional climate patterns. *Examples: mountains, geothermal features in Iceland, California currents*	Investigation 9 Part 3; Investigation 10 Part 1
Earth and Human Activity	**<u>FOSS Module</u>** **Investigation Part that addresses standard**
Human Impact	
Obtain, evaluate, and communicate information concerning the relationships between human activities and natural processes and how those relationships affect Earth's systems, including human population growth and its impact on the global environment over time. a. Define problems and design solutions to monitor and mitigate human impact on the environment. *Examples: water usage (removal of water from streams and aquifers or construction of dams and levees), land usage (urban development, agriculture, wetlands), pollution of air, water, and land*	<u>Weather and Water</u> Investigation 8 Part 3; Investigation 9 Parts 1-3 <u>Earth History</u> Investigation 8 Parts 1-3 <u>Planetary Science</u> Investigation 7 Part 4

2023 Alabama Course of Study Correlations

Grade Seven Life Science Content Standards

Next Generation Curriculum

From Molecules to Organisms: Structures and Processes	**FOSS Module** **Investigation Part that addresses standard**
Cell Structure and Processes	
Develop and use a model to explain the functions of specific cell structures necessary for maintaining a stable environment, including the cell membrane, cell wall, chloroplasts, endoplasmic reticulum, golgi apparatus, mitochondria, nucleus, ribosomes, and vacuoles. a. Engage in argument from evidence to support claims of cell theory. b. Construct an explanation of how prokaryotic and eukaryotic cells differ in structure and function. c. Plan and carry out an investigation to identify and explain features of a cell's semi-permeable membrane which enable it to control what enters and exits the cell.	Diversity of Life Investigation 1 Part 2; Investigation 2 Parts 2-3; Investigation 3 Parts 1-4; Investigation 4 Parts 1-4; Investigation 5 Part 3; Investigation 9 Parts 1 and 2
Construct an explanation of how photosynthesis and cellular respiration cycle matter and establish the flow of energy into and out of an organism.	Diversity of Life Investigation 4 Part 4;

a. Ask questions and construct an explanation of how anaerobic bacteria produce energy in environments with no oxygen.	Investigation 5 Parts 1-3
Growth and Development	
Construct an explanation of how the process of mitosis maintains complex organisms and ensures new cells with identical genetic information. Structure and Function Ask questions and communicate information regarding how errors in mitosis may affect cell division. *Example: formation of cancer cells*	Diversity of Life Investigation 3 Parts 1-4
Obtain, evaluate, and communicate information explaining how cells, tissues, and organs of various systems of the human body work together for specific functions, including the circulatory, digestive, muscular, nervous, respiratory, and skeletal systems. *Examples: responding to stimuli, moving, breaking down, or transporting nutrients*	Human Systems Interactions Investigation 1 Parts 1-2; Investigation 2 Parts 1-2; Investigation 3 Parts 1-4
Ecosystems: Interactions, Energy, and Dynamics	**FOSS Module** **Investigation Part that addresses standard**
Matter and Energy Flow	
Construct an explanation of how the cycling of matter between abiotic and biotic parts of ecosystems demonstrates the flow of energy and the conservation of matter, including the carbon, nitrogen, and water cycles.	Populations and Ecosystems Investigation 2 Parts 1-3; Investigation 3 Parts 1-3; Investigation 6 Part 1
Population Dynamics	
Analyze and interpret data to predict how environmental conditions, genetic factors, and	Populations and Ecosystems

resource availability will impact the growth of individual organisms and populations of organisms in an ecosystem. *Examples: location, population size, weather*	Investigation 1 Parts 1-3; Investigation 2 Parts 1-3; Investigation 3 Parts 1-3; Investigation 4 Parts 1-3; Investigation 6 Parts 1-4; Investigation 7 Parts 1-3; Investigation 8 Parts 1-3
Analyze and interpret data to explain how density-independent and density-dependent limiting factors in an ecosystem can lead to shifts in populations. *Examples: deforestation, disease, drought, fire, human activities, invasive species, succession*	<u>Populations and Ecosystems</u> Investigation 7 Parts 1-3; Investigation 8 Parts 1-3; Investigation 9 Parts 1-3
Interdependent Relationships	
Construct an explanation that predicts patterns of interactions between and among organisms in different ecosystems. *Examples: competition, predation, mutualism, commensalism, parasitism*	<u>Populations and Ecosystems</u> Investigation 1 Parts 1-3; Investigation 2 Parts 1-3; Investigation 3 Parts 1-3; Investigation 4 Parts 1-3; Investigation 6 Parts 1-4; Investigation 7 Parts 1-3; Investigation 8 Parts 1-3

Biodiversity	
Design a solution to maintain biodiversity and ecosystem services in a given scenario. *Examples: considering economic and social factors when making decisions about purifying water, recycling nutrients, preventing soil erosion, improving conditions for threatened and endangered species*	Populations and Ecosystems Investigation 8 Parts 1-3; Investigation 9 Parts 1-3
Obtain, evaluate, and communicate information about characteristic animal behaviors and specialized plant structures and their effect on the probability of successful reproduction. *Examples: building nest to protect young from cold, flower characteristics that attract pollinators*	Populations and Ecosystems Investigation 1 Parts 1-3; Investigation 7 Parts 1-3 Diversity of Life Investigation 6 Parts 2-4
Heredity: Inheritance and Variation of Traits	**FOSS Module** **Investigation Part that addresses standard**
Genetics and Biotechnology	
Develop and use models to demonstrate how genetic variations between parents and offspring result from differences in inherited genes located on chromosomes. *Examples: monohybrid crosses using Punnett squares, homozygous and heterozygous allele pairs, phenotypes and genotypes, variants*	Diversity of Life Investigation 7 Parts 1-2 Heredity and Adaptation Investigation 2 Parts 1-4; Investigation 3 Parts 1-3
Develop and use models to explain how genes are expressed through the flow of genetic information from DNA to RNA to a functional protein.	Diversity of Life Investigation 7 Parts 1-2
Develop and use models to explain that meiosis results in new genetic combinations with increased variation. a. Construct an explanation of the advantages and disadvantages of asexual and sexual	Diversity of Life Investigation 7 Parts 1-2

reproduction. *Examples: budding and binary fission occurring quickly, but with little variation; sexual reproduction requiring two organisms, but with increased variation* b. Construct an explanation from evidence of how genetic variants may result in harmful, beneficial, or neutral effects on the structure and function of an organism.	Heredity and Adaptation Investigation 2 Parts 1-4
Obtain, evaluate, and communicate information on the use of technologies that impact the inheritance and appearance of traits in organisms. *Examples: genetic engineering, gene therapy, selective breeding, genetically modified organisms*	Heredity and Adaptation Investigation 3 Parts 1-3
Unity and Diversity	
Phylogenetics	
Analyze and interpret data from examination of fossils, relict species, and modern organisms to determine patterns of change in anatomical structures over time. *Example: Use a cladogram or phylogenetic tree.*	Heredity and Adaptation Investigation 1 Parts 1-2; Investigation 2 Parts 1-4
Obtain, evaluate, and communicate evidence comparing patterns in the embryological development of multiple species to identify relationships not evident in the fully formed adult anatomy. *Example: Use pictorial evidence of development of different species.*	Heredity and Adaptation Investigation 2 Parts 1-4
Natural Selection	
Ask questions to clarify how natural selection over generations may lead to changes in the frequency of specific traits to enhance survival and reproduction of a population.	Heredity and Adaptation Investigation 2 Parts 1-4; Investigation 3 Parts 1-3

2023 Alabama Course of Study Correlations

Grade Eight Physical Science Content Standards

Next Generation Curriculum

Matter and Its Interactions	**FOSS Module** **Investigation Part that addresses standard**
Structure and Properties	
Plan and carry out investigations to support the claim that pure substances can be described and defined by their properties, including solubility, electrical conductivity, and density.	Chemical Interactions Investigation 1 Part 1 –2; Investigation 7 Parts 1-2
Develop and manipulate models to explain changes in particle motion, temperature, and state of a pure substance when thermal energy is added to or removed from a system.	Chemical Interactions Investigation 4 Parts 1-3; Investigation 5 Parts 1-3; Investigation 8 Parts 1-4
Justify a claim, based on evidence from investigations, that pure substances differ from mixtures, including solutions.	Chemical Interactions Investigation 1 Part 1 –2; Investigation 7 Parts 1-2
Obtain and communicate information from the periodic table, including atomic number, number of electrons and neutrons, average atomic mass, groups, and periods, to illustrate the structure and composition of atoms of different elements. a. Analyze and interpret data to differentiate among elements based	Chemical Interactions Investigation 2 Parts 1-2; Investigation 9 Parts 1-Part 3

on their properties and classify the elements as metals, nonmetals, or metalloids.	
Obtain, evaluate, and communicate information from the periodic table to make predictions about the reactivity of the main group elements. a. Use valence electron configuration to model ionic and covalent bonds.	Chemical Interactions Investigation 2 Parts 1-2
Chemical Reactions	
Observe and analyze data regarding characteristic properties of substances before and after they are combined to determine whether a chemical reaction has occurred. *Examples: color change, temperature change, production of a gas, formation of a precipitate*	Chemical Interactions Investigation 1 Parts 1 and 2; Investigation 2 Parts 1 and 2; Investigation 3 Parts 1-3; Investigation 4 Part 1; Investigation 7 Parts 1 and 2; Investigation 8 Parts 1-4; Investigation 9 Part 1; Investigation 10 Part 2
Analyze data from an investigation to determine whether thermal energy is released or absorbed in a chemical reaction. a. Design and test a device that can release or absorb thermal energy by chemical reactions.	Chemical Interactions Investigation 1 Part 2; Investigation 3 Parts 1-3; Investigation 9 Parts 1-3; Investigation 10 Parts 1 and 2
Engage in an argument from evidence to support the claim that matter is conserved in a chemical reaction. a. Use a model to verify that atoms of reactants are conserved as products in a chemical reaction. *Examples: simulations, atomic and molecular drawings, or equations to compare atoms in the reactants and products*	Chemical Interactions Investigation 1 Part 2; Investigation 3 Parts 1-3; Investigation 9 Parts 1-3; Investigation 10 Parts 1 and 2
Motion and Stability: Forces and Interactions	**FOSS Module** **Investigation Part that addresses standard**
Forces and Motion	

Use data from an investigation to identify factors that affect acceleration. *Examples: velocity vs. time graphs, data tables, diagrams*	<u>Gravity and Kinetic Energy</u> Investigation 1 Parts 1-2; Investigation 2 Part 1-2
Develop and use models to illustrate how individual external forces affect the motion of objects. *Examples: frictional forces, gravitational force, applied forces*	<u>Gravity and Kinetic Energy</u> Investigation 1 Parts 1-2; Investigation 2 Part 1-2 Investigation 3 Parts 1-3; Investigation 4 Part 1-2
Use models to demonstrate each of Newton's laws of motion and explain the effect of net force on objects. *Examples: A model car on a table remains at rest until pushed, and a marble rolls across the floor until friction causes it to stop (first law of inertia); a bicycle rider's leg muscles apply force to the mass of the bicycle, causing the bicycle to move, and greater acceleration results when pedaling harder creates a greater net force (second law); a ball hitting the ground applies downward action force and the ground applies an Cause and Effect upward reaction force, causing the ball to bounce (third law).* a. Use mathematical representations to explain how the sum of external forces on an object and the object's mass affect its acceleration. *Examples: data tables, graphs, diagrams*	<u>Electromagnetic Force</u> Investigation 1 Parts 1-3; Investigation 2 Parts 1-3; Investigation 4 Parts 1-3 <u>Gravity and Kinetic Energy</u> Investigation 1 Parts 1-2; Investigation 2 Part 1-2 Investigation 3 Parts 1-3; Investigation 4 Part 1-2
Use a model to identify factors affecting the strength of noncontact forces, including magnetic, gravitational, and electrical forces, and demonstrate that fields exist even though the objects are not in contact. a. Design and construct an electromagnet and modify the design to change its strength	<u>Electromagnetic Force</u> Investigation 1 Parts 1-3; Investigation 2 Parts 1-3; Investigation 3 Parts 1-3; Investigation 4 Parts 1-3
Energy	**<u>FOSS Module</u> Investigation Part that addresses standard**
Types of Energy	

Analyze graphical displays of data to describe the relationship of mass and velocity of an object to its kinetic energy (KE). *Examples: mass vs. KE graph, velocity vs. KE graph, data table*	Gravity and Kinetic Energy Investigation 3 Parts 1-3
Use models to construct an explanation of how a system of objects may contain varying amounts of potential energy, including gravitational, elastic, and chemical.	Gravity and Kinetic Energy Investigation 1 Parts 1-2; Investigation 2 Part 1-2; Investigation 3 Parts 1-3; Investigation 4 Part 1-2
Conservation Models of Energy	
Use models to construct an explanation of how energy is transformed but still conserved. *Example: kinetic energy to potential energy*	Gravity and Kinetic Energy Investigation 3 Part 1-3; Investigation 4
Develop and use a model to construct an explanation of how electrical energy is transferred and transformed. *Example: In a circuit, there is an energy source (battery) that has chemical potential energy. Chemical energy is transformed into electrical energy (current), transferred through the wires, and transformed again into light and heat in the light bulb. Add a resistor and analyze its effect on current.*	Electromagnetic Force Investigation 2 Parts 1-3; Investigation 3 Parts 1-3; Investigation 4 Parts 1-3
Waves and Their Applications in Technologies for Information Transfer	**FOSS Module** **Investigation Part that addresses standard**
Wave Properties	
Use models of mechanical and electromagnetic waves to qualitatively describe the relationships among wave properties, including amplitude, wavelength, and frequency. *Example: Use a model to show that frequency and wavelength are inversely proportional.* a. Use models to compare and contrast light and sound wave behaviors, including	Waves Investigation 1 Parts 1 and 2; Investigation 2 Parts 1-3; Investigation 3 Parts 1-4

reflection, refraction, diffraction, and speed, as waves propagate and interact with matter	
Information Transfer	
Construct an argument from evidence that digital and analog signals encode and transmit information differently .	Waves Investigation 4 Part 1-3