

Alignment to the Alabama Course of Study – Science



Grade K

State Standard	FOSS Alignment
Motion and Stability: Forces and Interactions	
1. Investigate the resulting motion of objects when forces of different strengths and directions act upon them (e.g., object being pushed, object being pulled, two objects colliding).	<p>FOSS Materials and Motion Investigations Guide Investigations 4, Parts 1 and 2, pp. 270-278</p> <p>FOSS Materials and Motion <i>Science Resources</i> Book Pushes and Pulls, pp. 47-59 Collisions, pp. 60-68</p>
2. Use observations and data from investigations to determine if a design solution (e.g., designing a ramp to increase the speed of an object in order to move a stationary object) solves the problem of using force to change the speed or direction of an object. *	<p>FOSS Materials and Motion Investigations Guide Investigations 4, Part 2, pp. 279-288</p>
Ecosystems: Interactions, Energy, and Dynamics	
3. Distinguish between living and nonliving things and verify what living things need to survive (e.g., animals needing food, water, and air; plants needing nutrients, water, sunlight, and air).	<p>FOSS Trees and Weather Investigations Guide Investigations 1, Parts 1, 5 and 6, pp. 74-89, 103-121 Investigations 4, Parts 1-3, 7-9, pp. 212-224, 240-254</p> <p>FOSS Trees and Weather <i>Science Resources</i> Book Where Do Trees Grow, pp. 3-13 What Do Plants Need, pp. 14-19 My Apple Tree, pp. 47-50 Orange Trees, pp. 51-56</p> <p>FOSS Animals Two by Two Investigation Guide Investigations 1-4, pp. 76-230</p> <p>FOSS Animals Two by Two <i>Science Resources</i> Book Fish Same and Different, pp. 3-9 Fish Live in Many Places, pp. 10-19 Birds Outdoors, pp. 20-28 Worms in Soil, pp. 37-47 Animals All Around Us, pp. 55-66 Living and Nonliving, pp. 67-86</p>
4. Gather evidence to support how plants and animals provide for their needs by altering their environment (e.g. 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).	<p>FOSS Trees and Weather Investigations Guide Investigations 1, Parts 1, pp. 78-89</p> <p>FOSS Animals Two by Two Investigation Guide Investigations 3, Part 2, pp. 172-190 Investigations 4, Part 2, pp. 206-212</p> <p>FOSS Animals Two by Two <i>Science Resources</i> Book Birds Outdoors, pp. 20-28 Worms in Soil, pp. 37-47</p>
5. Construct a model of a natural habitat (e.g., terrarium, ant farm, diorama) conducive to meeting the needs of plants and animals native to Alabama.	<p>FOSS Animals Two by Two Investigation Guide Investigations 3, Part 2, pp. 172-179 Investigations 4, Part 4, pp. 222-228</p>
6. Identify and plan possible solutions (e.g. reducing, reusing, recycling) to lessen the human impact on the local environment. *	<p>FOSS Materials and Motion Investigations Guide Investigations 2, Part 4, pp. 186-193 Investigations 3, Part 5, pp. 242-248</p> <p>FOSS Materials and Motion <i>Science Resources</i> Book Land, Air, and Water, pp. 41-45</p> <p>FOSS Materials and Motion Streaming Video Environmental Health</p>

Grade K

State Standard	FOSS Alignment
Earth's Systems	
<p>7. Observe and describe the effects of sunlight on Earth's surface (e.g., heat from the sun causing evaporation of water or increased temperature of soil, rocks, sand, and water).</p>	<p>FOSS Trees and Weather Investigations Guide Investigations 3, Parts 2, pp. 181-187</p> <p>FOSS Trees and Weather <i>Science Resources Book</i> Up in the Sky, pp. 20-31</p>
<p>8. Design and construct a device (e.g., hat, canopy, umbrella, tent) to reduce the effects of sunlight. *</p>	<p>FOSS Materials and Motion Investigations Guide Investigations 3, Part 6, pp. 249-256</p>
<p>9. Observe, record, and share findings of local weather patterns over a period of time (e.g., increase in daily temperature from morning to afternoon, typical rain and storm patterns from season to season).</p>	<p>FOSS Trees and Weather Investigations Guide Investigations 3, Parts 1, 2, 3, pp. 174-197</p> <p>FOSS Trees and Weather <i>Science Resources Book</i> Weather, pp. 32 – 46</p>
Earth and Human Activity	
<p>10. Ask questions to obtain information about the purpose of weather forecasts in planning for, preparing for, and responding to severe weather. *</p>	<p>FOSS Trees and Weather Investigations Guide Investigations 3, Part 3, pp. 191-197</p> <p>FOSS Trees and Weather <i>Science Resources Book</i> Weather, pp. 32-46</p>

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Grade 1

State Standard	FOSS Alignment
Waves and Their Applications in Technologies for Information Transfer	
<p>1. Conduct experiments to provide evidence that vibrations of matter can create sound (e.g., striking a tuning fork, plucking a guitar string) and sound can make matter vibrate (e.g., holding a piece of paper near a sound system speaker, touching your throat while speaking).</p>	<p>FOSS Sound and Light Investigations Guide Investigations 1, Parts 1-2, pp. 72-105 Investigations 2, Parts 1-3, pp. 118-152</p> <p>FOSS Sound and Light <i>Science Resources</i> Book Vibrations and Sound, pp. 3-7 Strings in Motion, pp. 24-32 More Musical Instruments, pp. 33 – 37</p>
<p>2. Construct explanations from observations that objects can be seen only when light is available to illuminate them (e.g., moon being illuminated by the sun, colors and patterns in a kaleidoscope being illuminated when held toward a light).</p>	<p>FOSS Sound and Light Investigations Guide Investigations 4, Part 3, pp. 223 -238</p> <p>FOSS Sound and Light <i>Science Resources</i> Book Seeing the Light, pp. 56-68</p> <p>FOSS Sound and Light Streaming Video Light and Darkness</p>
<p>3. Investigate materials to determine which types allow light to pass through (e.g., transparent materials such as clear plastic wrap), allow only partial light to pass through (e.g., translucent materials such as wax paper), block light (e.g., opaque materials such as construction paper), or reflect light (e.g., shiny materials such as aluminum foil).</p>	<p>FOSS Sound and Light Investigations Guide Investigations 3, Part 3, pp. 185-193</p> <p>FOSS Sound and Light Streaming Video All About Light</p>
<p>4. Design and construct a device that uses light or sound to send a communication signal over a distance (e.g., using a flashlight and a piece of cardboard to simulate a signal lamp for sending a coded message to a classmate, using a paper cup and string to simulate a telephone for talking to a classmate). *</p>	<p>FOSS Sound and Light Investigations Guide Investigations 2, Parts 3-4, pp. 143-159 Science Extensions, Page 161 Investigations 4, Part 4, pp. 238-239</p> <p>FOSS Sound and Light <i>Science Resources</i> Book Communicating with Light, pp. 69-76</p>
From Molecules to Organisms: Structures and Processes	
<p>5. Design a solution to a human problem by using materials to imitate how plants and/or animals use their external parts to help them survive, grow, and meet their needs (e.g., outerwear imitating animal furs for insulation, gear mimicking tree bark or shells for protection). *</p>	<p>FOSS Plants and Animals Investigations Guide Investigations 1-3, pp. 72-215</p> <p>FOSS Plants and Animals <i>Science Resources</i> Book What Do Plants Need? pp. 3-9 Plants and Animals Around the World, pp. 34-56 Learning from Nature, pp. 57-70</p> <p>FOSS Plants and Animals Streaming Video Animal Growth</p>
<p>6. Obtain information to provide evidence that parents and their offspring engage in patterns of behavior that help the offspring survive (e.g., crying of offspring indicating need for feeding, quacking or barking by parents indicating protection of young) .</p>	<p>FOSS Plants and Animals Investigations Guide Investigations 4, Part 4, pp. 248-250</p> <p>FOSS Plants and Animals <i>Science Resources</i> Book Animals and Their Young, pp. 71-84</p> <p>FOSS Plants and Animals Streaming Video Animal Offspring Caring for Animals</p>

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Grade 1

State Standard	FOSS Alignment
Heredity: Inheritance and Variation of Traits	
<p>7. Make observations to identify the similarities and differences of offspring to their parents and to other members of the same species (e.g., 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).</p>	<p>FOSS Plants and Animals Investigations Guide Investigations 1-2; 4, pp. 72-155, 224-253</p> <p>FOSS Plants and Animals <i>Science Resources Book</i> Variation, pp. 19 -26</p> <p>FOSS Plants and Animals Online Activities Find the Parent</p>
Earth's Place in the Universe	
<p>8. Observe, describe, and predict patterns of the sun, moon, and stars as they appear in the sky (e.g., sun and moon appearing to rise in one part of the sky, move across the sky, and set; stars other than our sun being visible at night, but not during the day).</p>	<p>FOSS Air and Weather Investigations Guide Investigations 2, Parts 2 and 4, pp. 147-158, 170-182 Investigations 4, Part 1, pp. 242-243</p> <p>FOSS Air and Weather <i>Science Resources Book</i> Changes in the Sky, pp. 26 – 37</p>
<p>9. Observe seasonal patterns of sunrise and sunset to describe the relationship between the number of hours of daylight and the time of year (e.g., more hours of daylight during summer as compared to winter).</p>	<p>FOSS Air and Weather Investigations Guide Investigations 4, Part 2, pp. 244-250</p> <p>FOSS Air and Weather <i>Science Resources Book</i> Changes in the Sky, pp. 26-37 Seasons, pp. 54-61</p>

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Grade 2

State Standard	FOSS Alignment
Matter and Its Interactions	
<p>1. Conduct an investigation to describe and classify various substances according to physical properties (e.g., milk being a liquid, not clear in color, assuming shape of its container, mixing with water; mineral oil being a liquid, clear in color, taking shape of its container, floating in water; a brick being a solid, not clear in color, rough in texture, not taking the shape of its container, sinking in water).</p>	<p>FOSS Solids and Liquids Investigations Guide Investigations 1-3, pp. 70-221</p> <p>FOSS Solids and Liquids <i>Science Resources</i> Book Liquids, pp. 31-37 Pouring, pp. 38-43 Comparing Solids and Liquids, pp. 44-53</p>
<p>2. Collect and evaluate data to determine appropriate uses of materials based on their properties (e.g., strength, flexibility, hardness, texture, absorbency).*</p>	<p>FOSS Solids and Liquids Investigations Guide Investigations 1-4, All Parts, pp. 76-273</p> <p>FOSS Solids and Liquids <i>Science Resources</i> Book Solids Objects and Materials, pp. 12-21 Comparing Solids and Liquids, pp. 44-53</p> <p>FOSS Solids and Liquids Streaming Video All About Properties of Matter Properties of Matter Clothing and Building Materials</p>
<p>3. Demonstrate and explain how structures made from small pieces (e.g., linking cubes, blocks, building bricks, creative construction toys) can be disassembled and then rearranged to make new and different structures.</p>	<p>FOSS Solids and Liquids Investigations Guide Investigations 1, Part 4, pp. 106-122</p> <p>FOSS Solids and Liquids Streaming Video Properties of Material Clothing and Building Materials</p>
<p>4. Provide evidence that some changes in matter caused by heating or cooling can be reversed (e.g., heating or freezing of water) and some changes are irreversible (e.g., baking a cake, boiling an egg).</p>	<p>FOSS Solids and Liquids Investigations Guide Investigations 4, All Parts, pp. 226 -277</p> <p>FOSS Solids and Liquids <i>Science Resources</i> Book Heating and Cooling, pp. 62 – 67 Is Change Reversible? pp. 68-76</p>
Ecosystems: Interactions, Energy, and Dynamics	
<p>5. Plan and carry out an investigation, using one variable at a time (e.g., water, light, soil, air), to determine the growth needs of plants.</p>	<p>FOSS Insects and Plants Investigations Guide Investigations 2, Parts 1-3, pp. 118-156</p> <p>FOSS Insects and Plants <i>Science Resources</i> Book Flowers and Seeds, pp. 18-26</p> <p>FOSS Insects and Plants Streaming Video How Plants Grow</p>
<p>6. Design and construct models to simulate how animals disperse seeds or pollinate plants (e.g., animals brushing fur against seed pods and seeds falling off in other areas, birds and bees extracting nectar from flowers and transferring pollen from one plant to another).*</p>	<p>FOSS Insects and Plants Investigations Guide Investigations 2, Part 4, pp. 157-168 Investigations 5, Part 4, pp. 294-301</p> <p>FOSS Insects and Plants <i>Science Resources</i> Book How Seeds Travel, pp. 27-34</p> <p>FOSS Insects and Plants Streaming Video What is Pollination? How Seeds Get Here... and There</p>

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Grade 2

State Standard	FOSS Alignment
Earth's Systems	
<p>8. Make observations from media to obtain information about Earth events that happen over a short period of time (e.g., tornados, volcanic explosions, earthquakes) or over a time period longer than one can observe (e.g., erosion of rocks, melting of glaciers) .</p>	<p>FOSS Pebbles, Sand, and Silt Investigations Guide Investigations 1, Parts 1 and 2, pp. 78-93 Investigations 2, Parts 2 and 4, pp. 136-143, 151-162 Investigations 4, Part 4, pp. 248-251</p> <p>FOSS Pebbles, Sand, and Silt <i>Science Resources</i> Book The Story of Sand, pp. 14-21 Rocks Move, pp. 22-23 Landforms, pp. 24-30 Erosion, pp. 68-78</p> <p>FOSS Pebbles, Sand, and Silt Streaming Video All About Volcanoes All About Landforms All About Soil</p>
<p>9. Create models to identify physical features of Earth (e.g., mountains, valleys, plains, deserts, lakes, rivers, oceans).</p>	<p>FOSS Pebbles, Sand, and Silt Investigations Guide Investigations 2, All Parts, pp. 128-162 Investigations 4, Parts 1 and 4, pp. 224 -230, 248-254</p> <p>FOSS Pebbles, Sand, and Silt <i>Science Resources</i> Book Ways to Represent Land and Water, pp. 79-91</p> <p>FOSS Pebbles, Sand, and Silt Streaming Video All About Volcanoes All About Landforms All About Soil</p>
<p>10. Collect and evaluate data to identify water found on Earth and determine whether it is a solid or a liquid (e.g., glaciers as solid forms of water; oceans, lakes, rivers, streams as liquid forms of water).</p>	<p>FOSS Pebbles, Sand, and Silt Investigations Guide Investigations 4, Parts 3-4, pp. 242-254</p> <p>FOSS Pebbles, Sand, and Silt <i>Science Resources</i> Book Where Is Water Found? pp. 50-60 States of Water, pp. 61-67</p>
Earth and Human Activity	
<p>11. Examine and test solutions that address changes caused by Earth's events (e.g., dams for minimizing flooding, plants for controlling erosion).*</p>	<p>FOSS Pebbles, Sand, and Silt Investigations Guide Investigations 4, Part 4, pp. 248-258</p> <p>FOSS Pebbles, Sand, and Silt <i>Science Resources</i> Book Erosion, pp. 68 – 78</p>

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Grade 3

State Standard	FOSS Alignment
Motion and Stability: Forces and Interactions	
<p>1. Plan and carry out an experiment to determine the effects of balanced and unbalanced forces on the motion of an object using one variable at a time, including number, size, direction, speed, position, friction, or air resistance (e.g., balanced forces pushing from both sides on an object, such as a <i>box</i>, producing no motion; unbalanced force on one side of an object, such as a ball, producing motion), and communicate these findings graphically</p>	<p>FOSS Motion and Matter <i>Investigations Guide</i> Investigation 1, Part 3, pp. 104-114 Investigation 2, All Parts, pp. 123-163</p> <p>FOSS Motion and Matter <i>Science Resources Book</i> Change of Motion, pp. 10-15 Patterns of Motion, pp. 15-17 What Goes Around, pp. 18-21</p> <p>FOSS Motion and Matter Streaming Video <i>All About Motion and Balance</i></p>
<p>2. Investigate, measure, and communicate in a graphical format how an observed pattern of motion (e.g., a child swinging in a swing, a ball rolling back and forth in a bowl, two children teetering on a see-saw, a model vehicle rolling down a ramp of varying heights, a pendulum swinging) can be used to predict the future motion of an object.</p>	<p>FOSS Motion and Matter <i>Investigations Guide</i> Investigations 2-3, pp. 123-203</p> <p>FOSS Motion and Matter <i>Science Resources Book</i> Soap Box Derby, pp. 34-37 How Engineers and Scientists Work Together, pp. 40-41</p> <p>FOSS Motion and Matter Online Activities Roller Coaster Builder Measuring Length Measurement Logic</p>
<p>3. Explore objects that can be manipulated in order to determine cause-and-effect relationships (e.g., distance between objects affecting strength of a force, orientation of magnets affecting direction of a magnetic force) of electric interactions between two objects not in contact with one another (e.g., force on hair from an electrically charged balloon, electrical forces between a charged rod and pieces of paper) or magnetic interactions between two objects not in contact with one another (e.g., force between two permanent magnets or between an electromagnet and steel paperclips, force exerted by one magnet versus the force exerted by two magnets).</p>	<p>FOSS Motion and Matter <i>Investigations Guide</i> Investigations 1-2, pp. 78-163</p> <p>FOSS Motion and Matter <i>Science Resources Book</i> Magnetism and Gravity, pp. 3-7 What Scientists Do, pp. 8-9</p> <p>FOSS Motion and Matter Streaming Video <i>All About Magnets</i></p> <p>FOSS Motion and Matter Online Activities Magnetic Poles</p>
<p>4. Apply scientific ideas about magnets to solve a problem through an engineering design project (e.g., constructing a latch to keep a door shut, creating a device to keep two moving objects from touching each other such as a maglev system).*</p>	<p>FOSS Motion and Matter <i>Investigations Guide</i> Investigation 3, All Parts, pp. 171-204</p> <p>FOSS Motion and Matter <i>Science Resources Book</i> What Engineers Do, pp. 22-31 Science Practices, p. 32 Engineering Practices, p. 33 Magnets at Work, pp. 42-45</p>

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State Standard	FOSS Alignment
From Molecules to Organisms: Structures and Processes	
<p>5. Obtain and combine information to describe that organisms are classified as living things, rather than nonliving things, based on their ability to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.</p>	<p>Structures of Life <i>Investigations Guide</i> Investigations 1-3, All Parts, pp. 82-264</p> <p>Structures of Life <i>Science Resources Book</i> The Reason for Fruit, pp. 3-7 The Most Important Seed, pp. 8-11 Germination, pp. 22-25</p> <p>Structures of Life Streaming Video How Plants Get Food</p>
<p>6. Create representations to explain the unique and diverse life cycles of organisms other than humans (e.g., flowering plants, frogs, butterflies), including commonalities such as birth, growth, reproduction, and death.</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 1, Parts 2-4, pp. 100-130 Investigation 2, All Parts, pp. 141-171</p> <p>Structures of Life <i>Science Resources Book</i> Germination, pp. 22-25 Life Cycle, pp. 26-33</p> <p>Structures of Life Streaming Video All About Animal Life Cycles</p> <p>Structures of Life Online Activities Life Cycles</p>
Heredity: Inheritance and Variation of Traits	
<p>7. Examine data to provide evidence that plants and animals, excluding humans, have traits inherited from parents and that variations of these traits exist in groups of similar organisms (e.g., flower colors in pea plants, fur color and pattern in animal offspring).</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 1, Part 3, p. 118 Investigation 2, Parts 2-3, pp. 153-172; Investigation 3, Part 2, p. 224</p> <p>Structures of Life <i>Science Resources Book</i> Barbara McClintock, pp. 12-15</p>
<p>8. Engage in argument from evidence to justify that traits can be influenced by the environment (e.g., stunted growth in normally tall plants due to insufficient water, change in an arctic fox's fur color due to light and/or temperature, stunted growth of a normally large animal due to malnourishment).</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 1, Part 4, pp. 120 -130 Investigation 2, Part Science Extensions, pp. 174-175 Investigation 3, Part 2, pp. 209 -228</p> <p>Structures of Life <i>Science Resources Book</i> Adaptations, pp. 42-49</p> <p>Structures of Life Streaming Video All About Animal Adaptations</p> <p>Structures of Life Online Activity Walking Stick Survival</p>

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Grade 3

State Standard	FOSS Alignment
Unity and Diversity	
<p>9. Analyze and interpret data from fossils (e.g., type, size, distribution) to provide evidence of organisms and the environments in which they lived long ago (e.g., marine fossils on dry land, tropical plant fossils in arctic areas, fossils of extinct organisms in any environment).</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 4, Part 2, pp. 299-301</p> <p>Structures of Life <i>Science Resources Book</i> Barn Owls, pp. 78-80 Fossils, pp. 81-87</p> <p>Structures of Life Streaming Video All About Fossils</p>
<p>10. Investigate how variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing (e.g., 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).</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 3, Parts 2- 4, pp. 208-252</p> <p>Structures of Life <i>Science Resources Book</i> Adaptations, pp. 42-49 Life on Earth, pp. 50-63</p> <p>Structures of Life Streaming Video All About Animal Adaptations</p> <p>Structures of Life Online Activities Walking Stick Survival</p>
<p>11. Construct an argument from evidence to explain the likelihood of an organism's ability to survive when compared to the resources in a certain habitat (e.g. freshwater organisms survive well, less well, or not at all in saltwater; desert organisms survive well, less well, or not at all in woodlands).</p> <p>a. Construct explanations that forming groups helps some organisms survive.</p> <p>b. Create models that illustrate how organisms and their habitats make up a system in which the parts depend on each other.</p> <p>c. Categorize resources in various habitats as basic materials (e.g., sunlight, air, freshwater, soil), produced materials (e.g., food, fuel, shelter), or as nonmaterial (e.g., safety, instinct, nature-learned behaviors).</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 2, Part 1, p. 151(b) Investigation 3, Parts 1 (a), 2 (c), 3 (a, b), 4 (b), 5 (b), pp. 194-260</p> <p>Structures of Life <i>Science Resources Book</i> The Most Important Seed (b), pp. 8-11 Germination (b), pp. 22-25 Adaptations (a, c), pp. 42-49 Life on Earth (c), pp. 50-63</p> <p>Structures of Life Streaming Video How Plants Get Food (b, c) All About Animal Adaptations (b)</p> <p>Structures of Life Online Activities Where Does It Live? What Doesn't Belong?</p>
<p>12. Evaluate engineered solutions to a problem created by environmental changes and any resulting impacts on the types and density of plant and animal populations living in the environment (e.g., replanting of sea oats in coastal areas due to destruction by hurricanes, creating property development restrictions in vacation areas to reduce displacement and loss of native animal populations).*</p>	<p>Structures of Life <i>Investigations Guide</i> Investigation 1, Part 2, pp. 110-111</p> <p>Structures of Life <i>Science Resources Book</i> The Most Important Seed, pp. 8-11 A Change in the Environment, pp. 66-69 Barn Owls, pp. 78-80</p>

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Earth's Systems	
<p>13. Display data graphically and in tables to describe typical weather conditions expected during a particular season (e.g., average temperature, precipitation, wind direction).</p>	<p>FOSS Water and Climate <i>Investigations Guide</i> Investigation 3, Part 1, pp. 198-209 Investigation 4, Part 1, pp. 254-261</p> <p>FOSS Water and Climate <i>Science Resources Book</i> Studying Weather, pp. 30-36</p> <p>FOSS Water and Climate Online Activities Weather Grapher</p>
<p>14. Collect information from a variety of sources to describe climates in different regions of the world.</p>	<p>FOSS Water and Climate <i>Investigations Guide</i> Investigation 2, Part 1, pp. 140-149 Investigation 3, Part 1, pp. 198-209 Investigation 4, Part 2, pp. 242-269</p> <p>FOSS Water and Climate <i>Science Resources Book</i> Vacation Aggravation, pp. 16-19 Celsius and Fahrenheit, p. 20 Studying Weather, pp. 30-36 Climate Regions, pp. 48-54</p> <p>FOSS Water and Climate Streaming Video All About Meteorology All About Climates and Regions</p> <p>FOSS Water and Climate Online Activities Climate Regions Maps</p>
Earth and Human Activity	
<p>15. Evaluate a design solution (e.g., flood barriers, wind resistant roofs, lightning rods) that reduces the impact of a weather-related hazard. *</p>	<p>FOSS Water and Climate <i>Investigations Guide</i> Investigation 4, Part 3, pp. 270-279</p> <p>FOSS Water and Climate <i>Science Resources Book</i> Wetlands for Flood Control, pp. 55-60 Conserving Water during Droughts, pp. 61-62</p> <p>FOSS Water and Climate Streaming Video Comes a Tide Flood</p>

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Grade 4

State Standard	FOSS Alignment
Energy	
<p>1. Use evidence to explain the relationship of the speed of an object to the energy of that object.</p>	<p>FOSS Energy Investigations Guide Investigation 4, Parts 2-3, pp. 288-311</p> <p>FOSS Energy Science Resources Book What Causes Change of Motion? pp. 74-77 Bowling, p. 78 Force and Energy, pp. 79-82 Potential and Kinetic Energy at Work, pp. 83-85</p> <p>FOSS Energy Streaming Video All About Transfer of Energy</p>
<p>2. Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents.</p> <p>a. Provide evidence that heat can be produced in many ways (e.g., rubbing hands together, burning leaves) and can move from one object to another by conduction.</p> <p>b. Demonstrate that different objects can absorb, reflect, and/or conduct energy.</p> <p>c. Demonstrate that electric circuits require a complete loop through which an electric current can pass.</p>	<p>FOSS Energy Investigations Guide Investigation 1, Parts 1-4 (c), pp. 102-164 Investigation 4, Part 1(a, b), pp. 278-287</p> <p>FOSS Energy Science Resources Book Edison Sees the Light (c), pp. 3-7 Energy Sources (c), pp. 8-12 Energy (a, b), pp. 65-73</p> <p>FOSS Energy Online Activities Lighting a Bulb Tutorial: Simple Circuits Tutorial: Conductors and Insulators</p>
<p>3. Investigate to determine changes in energy resulting from increases or decreases in speed that occur when objects collide.</p>	<p>FOSS Energy Investigations Guide Investigation 4, Parts 2-3, pp. 288-311</p> <p>FOSS Energy Science Resources Book What Causes Change of Motion? pp. 74-77 Bowling, p. 78 Force and Energy, pp. 79-82 Potential and Kinetic Energy at Work, pp. 83-85</p> <p>FOSS Energy Streaming Video All About Transfer of Energy</p>
<p>4. Design, construct, and test a device that changes energy from one form to another (e.g., electric circuits converting electrical energy into motion, light, or sound energy; a passive solar heater converting light energy into heat energy).*</p>	<p>FOSS Energy Investigations Guide Investigation 1, Parts 1-4, pp. 102-164 Investigation 4, Part 1, pp. 278-287 Investigation 5, Part 3, pp. 361-373</p> <p>FOSS Energy Science Resources Book Engineering a Solar Lighting System, pp. 25 -29 Energy, pp. 65-73 Alternative Sources of Electricity, pp. 114-119</p> <p>FOSS Energy Online Activities Turn on the Switch</p>

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Grade 4

State Standard	FOSS Alignment
<p>5. Compile information to describe how the use of energy derived from natural renewable and nonrenewable resources affects the environment (e.g., constructing dams to harness energy from water, a renewable resource, while causing a loss of animal habitats; burning of fossil fuels, a non-renewable resource, while causing an increase in air pollution; installing solar panels to harness energy from the sun, a renewable resource, while requiring specialized materials that necessitate mining.)</p>	<p>FOSS Soils, Rocks, and Landforms <i>Investigations Guide</i> Investigation 4, Part 1, pp. 264-265</p> <p>FOSS Energy <i>Investigations Guide</i> Investigation 1, Part 1, pp. 264-265 Investigation 5, Part 3, pp. 361-373</p> <p>FOSS Energy <i>Science Resources Book</i> Engineering a Solar Lighting System, pp. 25 -29 Alternative Sources of Electricity, pp. 114-119</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Natural Resources, Chapters. 7 and 8</p>
<p>Waves and Their Applications in Technologies for Information Transfer</p>	
<p>6. Develop a model of waves to describe patterns in terms of amplitude and wavelength, and including that waves can cause objects to move.</p>	<p>FOSS Energy <i>Investigations Guide</i> Investigation 5, Parts 1-2, pp. 324-360</p> <p>FOSS Energy <i>Science Resources Book</i> Waves, pp. 86-90 More About Sounds, pp. 91-99</p> <p>FOSS Energy Streaming Video Sound Energy Waves Real World of Science -Sound All About Waves</p>
<p>7. Develop and use models to show multiple solutions in which patterns are used to transfer information (e.g., 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, using Morse code to send a message). *</p>	<p>FOSS Energy <i>Investigations Guide</i> Investigations 3, Part 3, pp. 253-263</p> <p>FOSS Energy <i>Science Resources Book</i> <i>Morse Gets Clicking</i>, pp. 58-64</p>
<p>8. Construct a model to explain that an object can be seen when light reflected from its surface enters the eyes.</p>	<p>FOSS Energy <i>Investigations Guide</i> Investigation 5, Part 2, pp. 246-340</p> <p>FOSS Energy <i>Science Resources Book</i> Light Interactions, pp. 100-105 Throw a Little Light on Sight, pp. 106-110 More Light on the Subject, pp. 111-113</p> <p>FOSS Energy Streaming Video All About Light</p> <p>FOSS Energy Online Activities Reflecting Light</p>

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Grade 4

State Standard	FOSS Alignment
From Molecules to Organisms: Structures and Processes	
<p>9. Examine evidence to support an argument that the internal and external structures of plants (e.g., thorns, leaves, stems, roots, colored petals, xylem, phloem) and animals (e.g., heart, stomach, lung, brain, skin) function to support survival, growth, behavior, and reproduction .</p>	<p>FOSS Environments Investigations Guide Investigation 1, Parts 1-3, pp. 88-132 Investigation 2, Parts 1-2, pp. 150-171 Investigation 3, Parts 1-4, pp. 214-254 Investigation 4, Parts 1-3, pp. 274-307</p> <p>FOSS Environments Science Resources Book Two Terrestrial Environments, pp. 3-12 Isopods, pp. 16-17 Amazon Rain Forest, pp. 18-26 What Is an Ecosystem? pp. 32-34 Food Chains and Food Webs, pp. 35 -41 What Happens When Ecosystems Change? pp. 66-70 Variation and Selection, pp. 79-85</p> <p>FOSS Environments Streaming Video All About Plant Adaptations</p>
<p>10. Obtain and communicate information explaining that humans have systems that interact with one another for digestion, respiration, circulation, excretion, movement, control, coordination, and protection from disease.</p>	<p>Delta Science Content Reader Human Body Systems, pp. 3-22</p>
<p>11. Investigate different ways animals receive information through the senses, process that information, and respond to it in different ways (e.g., skunks lifting tails and spraying an odor when threatened, dogs moving ears when reacting to sound, snakes coiling or striking when sensing vibrations).</p>	<p>FOSS Environments Investigations Guide Investigation 2, Part 4, pp. 184-195</p> <p>FOSS Environments Science Resources Book Animals Sensory Systems, p. 48-54</p> <p>FOSS Environments Streaming Video Animal Language and Communication</p>

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Grade 4

State Standard	FOSS Alignment
Earth's Systems	
<p>12. Construct explanations by citing evidence found in patterns of rock formations and fossils in rock layers that Earth changes over time through both slow and rapid processes (e.g., rock layers containing shell fossils appearing above rock layers containing plant fossils and no shells indicating a change from land to water over time, a canyon with different rock layers in the walls and a river in the bottom indicating that over time a river cut through the rock).</p>	<p>FOSS Soils, Rocks, and Landforms Investigations Guide Investigation 2, Parts 1 and 4, pp. 150-161, 182-193 Investigation 3, Parts 3 and 4, pp. 232-250</p> <p>FOSS Soils, Rocks, and Landforms Science Resources Book Erosion and Deposition, pp. 9-14 Landforms Photo Album, pp. 15-22 Fossils Tell a Story, pp. 23-26 It Happened So Fast! pp. 38-49</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Fossils Mount St. Helen's Impact</p> <p>FOSS Soils, Rocks, and Landforms Online Activities Geology Lab Tutorial-Stream Tables: Slope and Flood</p>
<p>13. Plan and carry out investigations to examine properties of soils and soil types (e.g., color, texture, capacity to retain water, ability to support growth of plants).</p>	<p>FOSS Soils, Rocks, and Landforms Investigations Guide Investigation 1, Parts 1 and 4, pp. 81-101; 126-135 Investigation 4, Part 1, pp. 260-266</p> <p>FOSS Soils, Rocks, and Landforms Science Resources Book What Is Soil? pp. 9-14</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Soil</p>
<p>14. Explore information to support the claim that landforms are the result of a combination of constructive forces, including crustal deformation, volcanic eruptions, and sediment deposition as well as a result of destructive forces, including erosion and weathering.</p>	<p>FOSS Soils, Rocks, and Landforms Investigations Guide Investigation 1, Parts 2-3, pp. 102-125 Investigation 2, Parts 1-4, pp. 146-193 Investigation 3, Parts 3-4, pp. 231-248 Investigation 4, Part 1, pp. 260-266</p> <p>FOSS Soils, Rocks, and Landforms Science Resources Book Weathering, pp. 6-8 Erosion and Deposition, pp. 9-14 Landforms Photo Album-Page 15-22 It Happened So Fast! pp. 38-49</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Weathering and Erosion Volcanoes Mount St. Helen's Impact</p>
<p>15. Analyze and interpret data (e.g., angle of slope in downhill movement of water, volume of water flow, cycles of freezing and thawing of water, cycles of heating and cooling of water, speed of wind, relative rate of soil deposition, amount of vegetation) to determine effects of weathering and rate of erosion by water, ice, wind, and vegetation using one single form of weathering or erosion at a time.</p>	<p>FOSS Soils, Rocks, and Landforms Investigations Guide Investigation 1, Parts 2-3, pp. 102-125 Investigation 2, Parts 1-3, pp. 146-181</p> <p>FOSS Soils, Rocks, and Landforms Science Resources Book Weathering, pp. 6-8</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Weathering and Erosion</p> <p>FOSS Soils, Rocks, and Landforms Online Activities Geology Lab: Stream Tables Tutorial-Stream Tables: Slope and Flood Virtual Investigation-Stream Tables</p>

Alignment to the Alabama Course of Study – Science



Grade 4

State Standard	FOSS Alignment
<p>16. Describe patterns of Earth's features on land and in the ocean using data from maps (e.g., topographic maps of Earth's land and ocean floor; maps of locations of mountains, continental boundaries, volcanoes, and earthquakes).</p>	<p>FOSS Soils, Rocks, and Landforms <i>Investigations Guide</i> Investigation 3, Parts 1-3, Pp. 204-239</p> <p>FOSS Soils, Rocks, and Landforms <i>Science Resources Book</i> Topographic Maps, pp. 31-33 The Story of Mount Shasta, pp. 34-37</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Mount St. Helen's Impact</p> <p>FOSS Soils, Rocks, and Landforms Online Activities Topographer</p>
<p>17. Formulate and evaluate solutions to limit the effects of natural Earth processes on humans (e.g., designing earthquake, tornado, or hurricane-resistant buildings; improving monitoring of volcanic activity). *</p>	<p>FOSS Soils, Rocks, and Landforms <i>Investigations Guide</i> Investigation 3, Part 3, pp. 232-239 Investigation 4, Parts 1, pp. 260-269</p> <p>FOSS Soils, Rocks, and Landforms <i>Science Resources Book</i> Geoscientists at Work, pp. 55-59</p> <p>FOSS Soils, Rocks, and Landforms Streaming Video Mount St. Helen's Impact</p>

Grade 5

State Standard	FOSS Alignment
Matter and Its Interactions	
<p>1. Plan and carry out investigations (e.g., adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, evaporating salt water) to provide evidence that matter is made of particles too small to be seen.</p>	<p>FOSS Mixtures and Solutions <i>Investigations Guide</i> Investigation 1, Parts 1-2, pp. 94-116</p> <p>FOSS Earth and Sun Investigation 3, Part 1, pp. 246-256</p> <p>FOSS Mixtures and Solutions <i>Science Resources Book</i> Mixtures, pp. 3-7 Taking Mixtures Apart, pp. 8-12</p> <p>FOSS Mixtures and Solutions Streaming Video Elements, Compounds, and Mixtures</p>
<p>2. Investigate matter to provide mathematical evidence, including graphs, to show that regardless of the type of reaction (e.g., new substance forming due to dissolving or mixing) or change (e.g., phase change) that occurs when heating, cooling, or mixing substances, the total weight of the matter is conserved.</p>	<p>FOSS Mixtures and Solutions <i>Investigations Guide</i> Investigation 1, Part 2, pp. 108-116 Investigation 2, Part 3, pp. 174-185 Investigation 3, Part 2, pp. 207-216 Investigation 5, Part 2, pp. 321-330</p> <p>FOSS Mixtures and Solutions <i>Science Resources Book</i> Solids to Liquid, pp. 21-22 Liquids and Gas Changes, pp. 23-25</p> <p>FOSS Mixtures and Solutions Streaming Video Changes in the Properties of Matter</p>
<p>3. Examine matter through observations and measurements to identify materials (e.g., powders, metals, minerals, liquids) based on their properties (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility, density).</p>	<p>FOSS Mixtures and Solutions <i>Investigations Guide</i> Investigation 2, Part 1, pp. 154-164 Investigation 4, Part 1-3, pp. 256-284 Investigation 5, Parts 1-2, pp. 312-330</p> <p>FOSS Mixtures and Solutions <i>Science Resources Book</i> East Bay Academy for Young Scientists, pp. 50-53</p>
<p>4. Investigate whether the mixing of two or more substances results in new substances (e.g., mixing of baking soda and vinegar resulting in the formation of a new substance, gas; mixing of sand and water resulting in no new substance being formed).</p>	<p>Mixtures and Solution <i>Investigations Guide</i> Investigation 5, All Parts, pp. 312-341</p> <p>FOSS Mixtures and Solutions <i>Science Resources Book</i> When Substances Change, pp. 74-78 Air Bags, pp. 79-80</p> <p>FOSS Mixtures and Solutions Streaming Video Chemical Reactions Changes in Properties of Matter</p>
<p>5. Construct explanations from observations to determine how the density of an object affects whether the object sinks or floats when placed in a liquid.</p>	<p>FOSS Mixtures and Solutions <i>Investigations Guide</i> Investigation 3, Part 4, pp. 217-237</p> <p>FOSS Mixtures and Solutions Online Activities Tutorial: Density</p>

Alignment to the Alabama Course of Study – Science



Grade 5

State Standard	FOSS Alignment
Motion and Stability: Forces and Interactions	
6. Construct an explanation from evidence to illustrate that the gravitational force exerted by Earth on objects is directed downward towards the center of Earth.	<p>FOSS Earth and Sun Investigations Guide Investigation 2, Part 4, pp. 200-213</p> <p>FOSS Earth and Sun Science Resources Book Why Doesn't Earth Fly Off into Space? pp. 62-65</p> <p>FOSS Earth and Sun Streaming Video The Planets and the Solar System</p>
7. Design and conduct a test to modify the speed of a falling object due to gravity (e.g., constructing a parachute to keep an attached object from breaking). *	<p>FOSS Earth and Sun Investigations Guide Investigation 2, Part 4, pp. 200-213</p> <p>FOSS Earth and Sun Science Resources Book Why Doesn't Earth Fly Off into Space? pp. 62-65</p>
Ecosystems: Interactions, Energy, and Dynamics	
8. Defend the position that plants obtain materials needed for growth primarily from air and water.	<p>FOSS Living Systems Investigations Guide Investigation 2, Part 2, pp. 162-172 Investigation 3, Part 1, pp. 208-225</p> <p>FOSS Living Systems Science Resources Book Producers, pp. 23-26 Plant Vascular Systems, pp. 36-42</p> <p>FOSS Living Systems Streaming Video Plant Structure and Growth</p>
9. Construct an illustration to explain how plants use light energy to convert carbon dioxide and water into a storable fuel, carbohydrates, and a waste product, oxygen, during the process of photosynthesis.	<p>FOSS Living Systems Investigations Guide Investigation 2, Part 2, pp. 162-172 Investigation 3, Part 1, pp. 208-225</p> <p>FOSS Living Systems Science Resources Book Leaf Classification, pp. 34-35 Plant Vascular Systems, pp. 36-42 The Story of Maple Syrup, pp. 43-47</p> <p>FOSS Living Systems Streaming Video Plant Structure and Growth</p> <p>FOSS Living Systems Online Activities Plant Vascular System</p>
10. Construct and interpret models (e.g., diagrams, flow charts) to explain that energy in animals' food is used for body repair, growth, motion, and maintenance of body warmth and was once energy from the sun.	<p>FOSS Living Systems Investigations Guide Investigation 2, Part 3, pp. 173-189 Investigation 3, Parts 2-3, pp. 226-250</p> <p>FOSS Living Systems Science Resources Book Getting Nutrients, pp. 27-32 The Human Digestive System, pp. 32-33 The Human Circulatory System, pp. 48-53 The Human Respiratory System Page 54-55 Other Circulatory and Respiratory Systems, pp. 56-57</p> <p>FOSS Living Systems Streaming Video Circulatory and Respiratory Systems</p> <p>FOSS Living Systems Online Activities Mammalian Circulatory System</p>

Grade 5

State Standard	FOSS Alignment
<p>11. Create a model to illustrate the transfer of matter among producers; consumers, including scavengers and decomposers; and the environment.</p>	<p>FOSS Living Systems Investigations Guide Investigation 1, Parts 1-3, pp. 88-122 Investigation 2, Part 3, pp. 173-189 Investigation 4, Part 4, pp. 300-309</p> <p>FOSS Living Systems Science Resources Book The Biosphere, pp. 7-11 Monterey Bay National Marine Sanctuary, pp. 12-15 Nature's Recycling System, pp. 18-20 North Atlantic Ocean Ecosystem, pp. 74-80</p> <p>FOSS Living Systems Streaming Video Web of Life: Life in the Sea Food Chains Marine Ecosystems</p>
<p>Earth's Place in the Universe</p>	
<p>12. Defend the claim that one factor determining the apparent brightness of the sun compared to other stars is the relative distance from Earth.</p>	<p>FOSS Earth and Sun Investigations Guide Investigation 2, Parts 2, 4 and 5, pp. 180-188; 200-228</p> <p>FOSS Earth and Sun Science Resources Book Exploring the Solar System, pp. 47-60 Stargazing, pp. 66-70 Star Scientists, pp. 71-76 Our Galaxy, pp. 77-80</p> <p>FOSS Earth and Sun Streaming Video The Planets and the Solar System All About Stars</p>
<p>13. Analyze data and represent with graphs to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky (e.g., shadows and the position and motion of Earth with respect to the sun, visibility of select stars only in particular months).</p>	<p>FOSS Earth and Sun Investigations Guide Investigation 1, All Parts, pp. 96-140 Investigation 2, Part 5, pp. 214-228</p> <p>FOSS Earth and Sun Science Resources Book Changing Shadows, pp. 3-7 Sunrise and Sunset, pp. 8-13</p> <p>FOSS Earth and Sun Streaming Video All About Stars</p> <p>FOSS Earth and Sun Online Activities Shadow Tracker Tutorial: Sun Tracking Seasons</p>

Grade 5

State Standard	FOSS Alignment
Earth's Systems	
	<p>FOSS Earth and Sun Investigations Guide Investigations 3-4, All Parts, pp. 246-339 Investigation 5, Part 4, pp. 404-415</p> <p>FOSS Earth and Sun Science Resources Book What is Air? pp. 81-84 Earth's Atmosphere, pp. 85-91 Uneven Heating, pp. 95-98 Heating the Air: Radiation and Conduction, pp. 99-104 Wind Power, pp. 110-111 Earth's Climates, pp. 139-143</p> <p>FOSS Earth and Sun Streaming Video Earth's Atmosphere Climate and Seasons</p> <p>FOSS Earth and Sun Online Activities Tutorial: Air and Atmosphere Tutorial: Radiation Virtual Investigation: Uneven Heating</p>
<p>15. Identify the distribution of freshwater and salt water on Earth (e.g., oceans, lakes, rivers, glaciers, ground water, polar ice caps) and construct a graphical representation depicting the amounts and percentages found in different reservoirs.</p>	<p>FOSS Earth and Sun Investigations Guide Investigation 5, Part 3, pp. 388 -403</p> <p>FOSS Earth and Sun Science Resources Book Where Is Earth Water? p. 124 Water Cycle, pp. 125-129</p> <p>FOSS Earth and Sun Online Activities Water Cycle</p>
Earth and Human Activity	
<p>16. Collect and organize scientific ideas that individuals and communities can use to protect Earth's natural resources and its environment (e.g., terracing land to prevent soil erosion, utilizing no-till farming to improve soil fertility, regulating emissions from factories and automobiles to reduce air pollution, recycling to reduce overuse of landfill areas).</p>	<p>FOSS Earth and Sun Investigations Guide Investigation 4, Part 4, pp. 340-358</p> <p>FOSS Earth and Sun Science Resources Book Solar Technology, pp. 112-119</p>
<p>17. Design solutions, test, and revise a process for cleaning a polluted environment (e.g., simulating an oil spill in the ocean or a flood in a city and creating a solution for containment and/or cleanup).*</p>	<p>FOSS Mixtures and Solutions Investigations Guide Investigation 4 (Extension), pgs. 299-300</p>