**A Correlation of**

# Interactive Science
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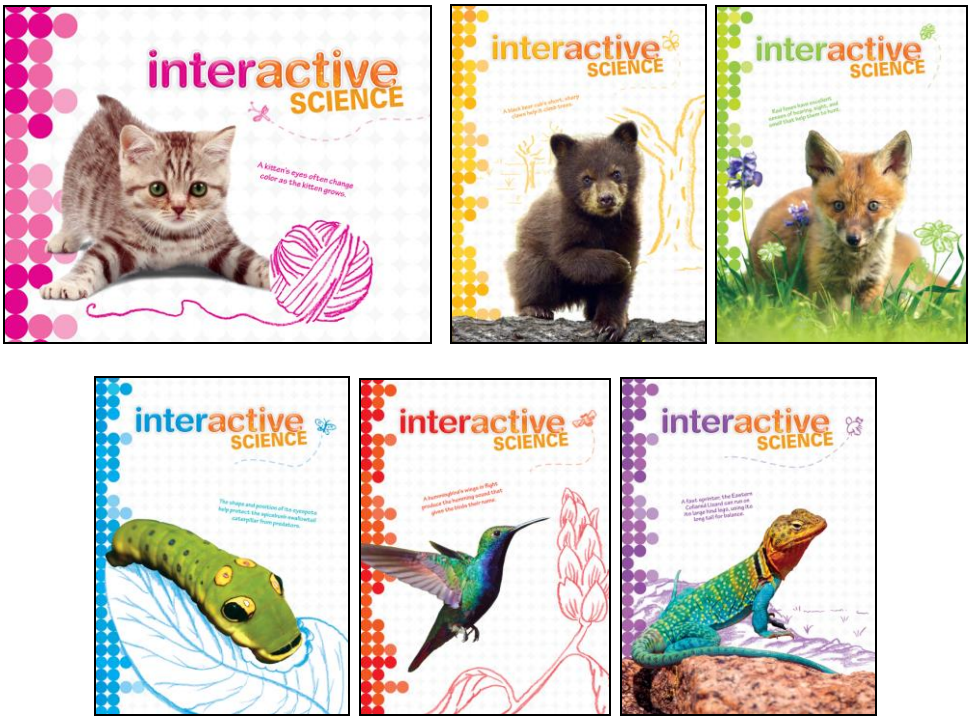


**To the**

## Alabama Math, Science, and Technology Initiative – Grade K-5 Units

**and the**

## 2015 Alabama Course of Study Science

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**2015 Alabama Course of Study, Science**

## Introduction

The following document demonstrates how the **Interactive Science, ©2016, Grades K-5** program corresponds to the Alabama Math, Science, and Technology Initiative (AMSTI) curriculum for Grades K-5, including references to the associated 2015 Alabama Course of Study standards for Science. Correlation references are to the Student Edition and Teacher Edition. Please note that the Kindergarten Student Edition text pages are two-sided; each singular page contains a corresponding Activity Page on the reverse side.

**Interactive Science** is an elementary science program that makes learning personal, engaging, and relevant for today's student. The program features an innovative Write-in Student Edition that enables students to become active participants in their learning and truly connect the Big Ideas of science to their world.

The 2016 editions of **Interactive Science** support the Next Generation Science Standards (NGSS) in several ways. In the Student Edition, lessons provide interactive opportunities for students to acquire the Disciplinary Core Ideas that are the building blocks of the NGSS Performance Expectations at each grade level. STEM Activities, Apply It! activities, Design It! Activities, and Performance-Based Assessments enable students to research, investigate, and apply Science and Engineering Practices to real-world problems in a meaningful way. In the Teacher's Edition, the NGSS Cross-Cutting Concepts that link across grade levels and across disciplines within grade levels are noted at the chapter level, and a detailed and focused Performance Expectation Activity is provided for each NGSS standard.

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| AMSTI Unit | 2015 Alabama Course of Study - Science | Interactive Science Kindergarten, ©2016 |
|---|---|---|
| **KINDERGARTEN** | | |
| **Plants and Animals (Grade K, Year One)** | **Ecosystems: Interactions, Energy, and Dynamics** | **Chapter 2: Living Things Lesson 3.6: What is Recycling?** |
| | 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). | **SE Only:** 20, Activity 20, 21, Activity 21, 33, Activity 33, 34, Activity 34, 35, Activity 35, 36, Activity 36, 37, Activity 37, 38, Activity 38<br><br>**TE Only:** 36-37, 40-41, 42, 48-49, 50-51, 52-53, 54-55, 56-57, 58-59, 61, 62-63, 66-67, 69, 71a, 71c |
| | 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). | **SE Only:** 38, 39<br><br>**TE Only:** 58-59, 60, 64-65, 71b |
| | 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. | **SE Only:** 39<br><br>**TE Only:** 60, 64-65, 69, 71c |
| | 6. Identify and plan possible solutions (e.g. reducing, reusing, recycling) to lessen the human impact on the local environment.* | **SE Only:** 59, Activity 59<br><br>**TE Only:** 96-97, 100, 104 (Chapter Test #2), 109e, 148 (Social Studies) |

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|---|---|---|
| **Weather Walk (Grade K, Year One)** | **Earth's Systems** | **Chapter 3: Earth and Sky** |
| | 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). | **SE Only:** 56, Activity 56, 60, Activity 60<br><br>**TE Only:** 90-91, 98, 100, 102-103, 109c |
| | 8. Design and construct a device (e.g., hat, canopy, umbrella, tent) to reduce the effects of sunlight.* | **SE Only:** 44-53<br><br>**TE Only:** 82-85, 109d |
| | 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). | **SE Only:** 42, Activity 42<br><br>**TE Only:** 75 (Writing), 80, 100, 107-108, 109a |
| | **Earth and Human Activity** | **Chapter 3: Earth and Sky** |
| | 10. Ask questions to obtain information about the purpose of weather forecasts in planning for, preparing for, and responding to severe weather.* | **SE Only:** 61, Activity 61<br><br>**TE Only:** 99, 101, 109b |


SE = Student Edition TE = Teacher's Edition

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|---|---|---|
| **Push and Pull (Grade K, Year Two)** | **Motion and Stability: Forces and Interactions** | **Chapter 1: Motion** |
| | 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). | **SE Only:** 1, 4, 4-13, 15, Activity 15, 16, 17, Activity 17, 18, Activity 18<br><br>**TE Only:** 4 (Reading), 9, 12-13, 14-15, 18-19, 20-21, 22-23, 24, 26, 27, 28-29, 31 (Chapter Test #6), 33a |
| | 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.* | **SE Only:** 4-13<br><br>**TE Only:** 12-15, 33b |

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|---|---|---|
| **GRADE 1** | | |
| **Sound, Light, and Sky (Grade 1, Year One)** | **Waves and Their Applications in Technologies for Information Transfer** | **Chapter 1: Energy** |
| | 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). | **SE/TE:** 28, 31 (At-Home Lab), 32-33<br><br>**TE only:** 33a-33d, 43a |
| | 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). | **TE only:** 43b |
| | 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). | **SE/TE:** 4, 40-41<br><br>**TE only:** 43c |

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|---|---|---|
| **Sound, Light, and Sky (Grade 1, Year One)** | 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).* | **SE/TE:** 6-15, 43 (Send a Message)<br><br>**TE only:** 43d |
| | **Earth's Place in the Universe** | **Chapter 3: Patterns in Space** |
| | 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). | **SE/TE:** 102, 118-123, 139 (Day and Night)<br><br>**TE only:** 100c (Reading, Social Studies), 139a |
| | 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). | **SE/TE:** 124-127, 139 (Sunrise, Sunset)<br><br>**TE only:** 116 (Science Notebook), 126 (Science/Social Studies), 139b |

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|---|---|---|
| **Wild Organisms (Grade 1, Year Two)** | **From Molecules to Organisms: Structures and Processes** | **Chapter 2: Plants and Animals** |
| | 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).* | **TE only:** 99a |
| | 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). | **TE only:** 99b |
| | **Heredity: Inheritance and Variation of Traits** | **Chapter 2: Plants and Animals** |
| | 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). | **SE/TE:** 46, 59-63, 65, 72, 78-81, 82-85<br><br>**TE only:** 99c |

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| **GRADE 2** | | |
| **Solids and Liquids (Grade 2, Year One)** | **Matter and Its Interactions** | **Chapter 1: Matter** |
| | 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). | **SE/TE:** 16, 17-23, 58-59, 60 (Group Objects), 61 (Order Objects by Mass)<br><br>**TE only:** 2c (Reading), 21 (Science Notebook), 61a |
| | 2. Collect and evaluate data to determine appropriate uses of materials based on their properties (e.g., strength, flexibility, hardness, texture, absorbency).* | **SE/TE:** 40, 41-47<br><br>**TE only:** 61b |
| | 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. | **SE/TE:** 42-43, 61 (Make a Presentation)<br><br>**TE only:** 2 (CCC Energy and Matter), 61c |
| | 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). | **SE/TE:** 27 (At-Home Lab), 37-39, 60 (Cool a Balloon)<br><br>**TE only:** 61d |

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|---|---|---|
| **Soils and Shores (Grade 2, Year One)** | **Earth's Systems** | **Chapter 3: Earth's Materials** |
| | 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). | **SE/TE:** 138, 139-143<br><br>**TE only:** 118 (CCC Stability and Change), 159a |
| | 9. Create models to identify physical features of Earth (e.g., mountains, valleys, plains, deserts, lakes, rivers, oceans). | **SE/TE:** 121, 134-137<br><br>**TE only:** 159c |
| | 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). | **SE/TE:** 120, 133<br><br>**TE only:** 159d |
| | **Earth and Human Activity** | **Chapter 3: Earth's Materials** |
| | 11. Examine and test solutions that address changes caused by Earth's events (e.g., dams for minimizing flooding, plants for controlling erosion).* | **TE only:** 140 (Differentiated Instruction), 159b |

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|---|---|---|
| **Plants and Bugs (Grade 2, Year Two)** | **Ecosystems: Interactions, Energy, and Dynamics** | **Chapter 2: Plants and Animals** |
| | 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. | **SE/TE:** 64, 77-81, 104-105, 116 (Light and Seeds)<br><br>**TE only:** 105a-105d, 117a |
| | 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).* | **SE/TE:** 79<br><br>**TE only:** 117b |
| | 7. Obtain information from literature and other media to illustrate that there are many different kinds of living things and that they exist in different places on land and in water (e.g., woodland, tundra, desert, rainforest, ocean, river). | **SE/TE:** 65, 76, 95-99, 117<br><br>**TE only:** 62c (Reading, Music), 96 (Science Writing), 99 (Science Notebook), 117c |

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|---|---|---|
| **GRADE 3** | | |
| **Heredity and Diversity (Grade 3, Year One)** | **From Molecules to Organisms: Structures and Processes** | **Chapter 3: Plants**<br>**Chapter 4: Living Things** |
| | 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. | **SE/TE:** 101-141, 153-184<br><br>**TE only:** 152C, 152D, 204-205 |
| | 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. | **SE/TE:** 134-139, 176-183, 245 (Life Cycle Poster)<br><br>**TE only:** 183a, 179 (21st Century Learning), 180 (Science Notebook), 183b (question #6), 245a |
| | **Heredity: Inheritance and Variation of Traits** | **Chapter 4: Living Things** |
| | 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). | **SE/TE:** 168-170, 245 (Matching Traits)<br><br>**TE only:** 245c |
| | 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). | **SE/TE:** 174-175<br><br>**TE only:** 175 (21st Century Learning), 245d<br>. |

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| **Heredity and Diversity (Grade 3, Year One)** | **Unity and Diversity** | **Chapter 4: Living Things**<br>**Chapter 5: Ecosystems** |
| | 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). | **SE/TE:** 224-227<br><br>**TE only:** 227b (questions #4, 5), 245e |
| | 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). | **SE/TE:** 174-175<br><br>**TE only:** 175 (21st Century Learning), 245b |
| | 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). | **SE/TE:** 228-229, 239<br><br>**TE only:** 196 (Predict), 197 (SEP), 229a-229c, 245g |
| | a. Construct explanations that forming groups helps some organisms survive. | **SE/TE:** 168, 208<br><br>**TE only:** 175a, 245f |
| | b. Create models that illustrate how organisms and their habitats make up a system in which the parts depend on each other. | **SE/TE:** 204-209, 211-215<br><br>**TE only:** 207 |

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| **Heredity and Diversity (Grade 3, Year One)** | 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). | **SE/TE:** 205-209<br><br>**TE only:** 207 (Science Notebook) |
| | 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). | **SE/TE:** 216-223<br><br>**TE only:** 245h |
| **Weather and Climate (Grade 3, Year One)** | **Earth's Systems** | **Chapter 6: Weather Patterns** |
| | 13. Display data graphically and in tables to describe typical weather conditions expected during a particular season (e.g., average temperature, precipitation, wind direction). | **SE/TE:** 264-265, 276-277<br><br>**TE only:** 265a, 277b-277d, 289a |
| | 14. Collect information from a variety of sources to describe climates in different regions of the world. | **SE/TE:** 254, 260-261<br><br>**TE only:** 261 (Science Notebook), 289b |
| | **Earth and Human Activity** | |
| | 15. Evaluate a design solution (e.g., flood barriers, wind resistant roofs, lightning rods) that reduces the impact of a weather-related hazard.* | **SE/TE:** 270-275<br><br>**TE only:** 275 (21st Century Learning), 289c |

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| **Forces and Interactions (Grade 3, Year Two)** | **Motion and Stability: Forces and Interactions** | **Chapter 1: Forces and Motion** |
| | 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 box, producing no motion; unbalanced force on one side of an object, such as a ball, producing motion), and communicate these findings graphically. | **SE/TE:** 14, 16 (Lightning Lab), 18-19, 26-27<br><br>**TE only:** 27a-27d, 99a |
| | 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. | **SE/TE:** 9-13, 14-19, 26-27<br><br>**TE only:** 27a-27c, 99b |

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| **Forces and Interactions (Grade 3, Year Two)** | 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). | **SE/TE:** 2, 20-21, 77<br><br>**TE only:** 99c |
| | 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).* | **SE/TE:** 2, 99 (Solve a Problem)<br><br>**TE only:** 99d |

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| **GRADE 4** | | |
| **Energy and Waves (Grade 4, Year One)** | **Energy** | **Chapter 1: Energy and Heat**<br>**Chapter 3: Electricity** |
| | 1. Use evidence to explain the relationship of the speed of an object to the energy of that object. | **SE/TE:** 14, 62-63<br><br>**TE only:** 15 (Differentiated Instruction), 111a |
| | 2. Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents. | **SE/TE:** 2**,** 4-6, 106-109<br><br>**TE only:** 111b |
| | 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. | **SE/TE:** 28-33, 95, 194 |
| | b. Demonstrate that different objects can absorb, reflect, and/or conduct energy. | **SE/TE:** 28, 34-36, 82-85, 194 |
| | c. Demonstrate that electric circuits require a complete loop through which an electric current can pass. | **SE/TE:** 80, 86-91, 92, 96-97<br><br>**TE only:** 90 (in Science Notebook), 97a-97d |
| | 3. Investigate to determine changes in energy resulting from increases or decreases in speed that occur when objects collide. | **SE/TE:** 58-59, 110<br><br>**TE only:** 111c |
| | 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).* | **SE/TE:** 91-92, 96-97, 194<br><br>**TE only:** 97a-97d, 111d |

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| **Energy and Waves (Grade 4, Year One)** | 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 nonrenewable 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). | **SE/TE:** 195-199, 211<br><br>**TE only:** 196 (21st Century Learning), 198 (Science Notebook), 229d |
| | 6. Develop a model of waves to describe patterns in terms of amplitude and wavelength, and including that waves can cause objects to move. | **SE/TE:** 17-21<br><br>**TE only:** 18 (Content Refresher), 111e |
| | 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).* | **SE/TE:** 19<br><br>**TE only:** 111f |
| | 8. Construct a model to explain that an object can be seen when light reflected from its surface enters the eyes. | **SE/TE:** 26-27<br><br>**TE only:** 1G-1H (On-Level Reader Support), 111g |

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| **Water and Landforms (Grade 4, Year Two)** | **Earth's Systems** | **Chapter 4: Ecosystems**<br>**Chapter 5: Earth's Resources** |
| | 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). | **SE/TE:** 201-205, 206-210, 255-259, 261-264<br><br>**TE only:** 209 (Science/Writing), 229c, 295d |
| | 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). | **SE/TE:** 178-181, 234-236 |
| | 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. | **SE/TE:** 254-259, 261-264<br><br>**TE only:** 257 (Science Notebook) |

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| **Water and Landforms (Grade 4, Year Two)** | 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. | **SE/TE:** 254-259, 278-279, 290-293<br><br>**TE only:** 258 (Science Notebook), 279a-279d, 295a |
| | 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). | **SE/TE:** The online "Topographic Map" activity for Chapter 6, Lesson 3, meets this standard. Supporting content describing Earth's features and examples of where these occur can be found on pgs. 261-265.<br><br>**TE only:** 295b |
| | 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).* | **SE/TE:** 234-237<br><br>**TE only:** 295c |

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| **Animal Studies (Grade 4., Year Two)** | **From Molecules to Organisms: Structures and Processes** | **Chapter 4: Plants and Animals** |
| | 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. | **SE/TE:** 122 (#5), 124-125, 129-135, 138-141, 142, 143-147<br><br>**TE only:** 112C (What Do Leaves and Stems Do?), 112D (Getting to the Root of Plants), 229a |
| | 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. | **SE only:** xxii-xxxiii<br>**TE only:** xlvi-xlvii |
| | 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). | **SE/TE:** 154-159, 225 (Write a Biography), 226 (Research Animal Instincts)<br><br>**TE only:** 158 (Science/Writing), 229b |

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| **GRADE 5** | | |
| **Dynamics of Ecosystems (Grade 5, Year One)** | **Ecosystems: Interactions, Energy, and Dynamics** | **Chapter 4: Ecosystems** |
| | 8. Defend the position that plants obtain materials needed for growth primarily from air and water. | **SE/TE:** 102, 146, 151, 154-157<br><br>**TE only:** 195b |
| | 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. | **SE/TE:** 151, 153-157<br><br>**TE only:** 154 (Differentiated Instruction), 157 (RTI) |
| | 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. | **SE/TE:** 159-165<br><br>**TE only:** 195a |
| | 11. Create a model to illustrate the transfer of matter among producers; consumers, including scavengers and decomposers; and the environment. | **SE/TE:** 159-165, 195 (Create a Food Web Model)<br><br>**TE only:** 162 (Science Notebook), 163 (Science Notebook), 195c |
| | **Earth's Systems** | **Chapter 5: The Water Cycle and Weather** |
| | 14. Use a model to represent how any two systems, specifically the atmosphere, biosphere, geosphere, and/or hydrosphere, interact and support life (e.g., influence of the ocean on ecosystems, landform shape, and climate; influence of the atmosphere on landforms and ecosystems through weather and climate; influence of mountain ranges on winds and clouds in the atmosphere). | **SE/TE:** 204-209, 210-215, 230-235<br><br>**TE only:** 215b, 313a |

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| **Dynamics of Ecosystems (Grade 5, Year One)** | 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. | **SE/TE:** 213<br><br>**TE only:** 313b |
| | **Earth and Human Activity** | **Chapter 4: Ecosystems** |
| | 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). | **SE/TE:** 174-183<br><br>**TE only:** 183b, 195b |
| | 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).* | **SE/TE:** 4-7, 51, 174, 200-203<br><br>**TE only:** 200-201 (Background) |
| **Matter and Interactions (Grade 5, Year Two)** | **Matter and Its Interactions** | **Chapter 1: Properties of Matter** |
| | 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. | **SE/TE:** 8, 9-15, 22, 34<br><br>**TE only:** 13 (Content Refresher), 99a |

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| **Matter and Interactions (Grade 5, Year Two)** | 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. | **SE/TE:** 22, 28-33, 34<br><br>**TE only:** 99b |
| | 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). | **SE/TE:** 9-13, 16-21<br><br>**TE only:** 99c |
| | 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). | **SE/TE:** 28-33<br><br>**TE only:** 30 (Science Notebook), 99d |
| | 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. | **SE/TE:** 19, 25, 28, 30, 40-41 |

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| **Earth: Gravity and Space (Grade 5, Year Two)** | **Motion and Stability: Forces and Interactions** | **Chapter 2: Forces and Motion** |
| | 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. | **SE/TE:** 60, 64-65<br><br>**TE only:** 99e |
| | 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).* | **SE/TE:** 54, 64, 82-83 |
| | **Earth's Place in the Universe** | **Chapter 6: Earth and Space** |
| | 12. Defend the claim that one factor determining the apparent brightness of the sun compared to other stars is the relative distance from Earth. | **SE/TE:** 274, 275 (Got It? #9)<br><br>**TE only:** 313c |
| | 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). | **SE/TE:** 264-269, 272 (Lightning Lab)<br><br>**TE only:** 266 (Science Writing), 313d |