



Correlation to the
**SOUTH CAROLINA ACADEMIC STANDARDS AND
PERFORMANCE INDICATORS FOR SCIENCE**

Grades 6-8
Delta Education



GRADE 6

SCIENCE AND ENGINEERING PRACTICES

NOTE: Scientific investigations should always be done in the context of content knowledge expected at this grade level. The standard describes how students should learn and demonstrate knowledge of the content outlined in the other standards.

Standard 6.S.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

6.S.1A. Conceptual Understanding: The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.S.1A.1 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge claims.	FOSS Weather and Water Investigations Guide 2E Investigations 1 through 10; Example: Investigation 2 Part 1: The Air around Us, pp. 100-111
6.S.1A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.	FOSS Weather and Water Investigations Guide 2E Investigation 3, Part 2: Pressure Maps, pp. 154-163 Investigation 7, Part 1: Is Water Really There? pp. 333-340
6.S.1A.3 Plan and conduct controlled scientific investigations to answer questions, test hypotheses, and develop explanations: (1) formulate scientific questions and testable hypotheses, (2) identify materials, procedures, and variables, (3) select and use appropriate tools or instruments to collect qualitative and quantitative data, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.	FOSS Weather and Water Investigations Guide 2E Investigation 4, Part 2: Convection in Water, pp. 193-206 Investigation 7, Part 1: Is Water Really There? pp. 333-340
6.S.1A.4 Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to (1) reveal patterns and construct meaning or (2) support hypotheses, explanations, claims, or designs.	FOSS Weather and Water Investigations Guide 2E Investigation 5, Part 3: Heating Earth, pp. 252-264 Investigation 8, Part 1: Weather Balloons, pp. 375-381 Investigation 9, Part 3: Ocean Climate, pp. 434-446 Investigation 10, Part 1: Climate Change, pp. 464-460 Part 3: Climate in the News, pp. 485-494
6.S.1A.5 Use mathematical and computational thinking to (1) use and manipulate appropriate metric units, (2) collect and analyze data, (3) express relationships between variables for models and investigations, or (4) use grade-level appropriate statistics to analyze data.	FOSS Weather and Water Investigations Guide 2E Investigation 5, Part 1: Latitude Part, pp. 229-237, Part 3: Heating Earth, pp. 252-264 Investigation 9, Part 3: Ocean Climate, pp. 434-446
6.S.1A.6 Construct explanations of phenomena using (1) primary or secondary scientific evidence and models, (2) conclusions from scientific investigations, (3) predictions based on observations and measurements, or (4) data communicated in graphs, tables, or diagrams.	FOSS Weather and Water Investigations Guide 2E Investigation 2, Part 1: The Air around Us, pp. 100-111 Investigation 5, Part 1: Latitude, pp. 229-237 Investigation 7, Part 1: Is Water Really There?, pp. 333-340 Investigation 9, Part 3: Ocean Climate, pp. 434-446
6.S.1A.7 Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.	FOSS Weather and Water Investigations Guide 2E Investigation 2, Part 2: Earth's Atmosphere, pp. 112-124 Investigation 7, Part 1: Is Water Really There?, pp. 333-340 Investigation 10, Part 3: Climate in the News, pp. 485-494 Part 4: Identify Key Ideas, pp. 495-503

<p>6.S.1A.8 Obtain and evaluate scientific information to (1) answer questions, (2) explain or describe phenomena, (3) develop models, (4) evaluate hypotheses, explanations, claims, or designs or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate primary or secondary scientific literature, or (2) reporting the results of student experimental investigations.</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 1, Part 1: Into the Weather, pp. 63-73, Part 2: Local Weather pp. 74-85 Investigation 2, Part 2: Earth's Atmosphere, pp. 112-124 Investigation 3, Part 1: Air-Pressure Inquiry, pp. 138-153 Investigation 4, Part 1: Density of Fluids, pp. 177-192 Investigation 5, Part 2: Solar Angle, pp. 238-251 Investigation 6, Part 2: Local Winds, pp. 295-301</p>
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6.S.1B. Conceptual Understanding: Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>6.S.1B.1 Construct devices or design solutions using scientific knowledge to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the device or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem and refine the design if needed, and (6) communicate the results.</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 2, Part 1: The Air around Us, pp. 100-111</p>

GRADE 6

EARTH SCIENCE: EARTH'S WEATHER AND CLIMATE

Standard 6.E.2: The student will demonstrate an understanding of the interactions within Earth's systems (flow of energy) that regulate weather and climate.

6.E.2A. Conceptual Understanding: Earth's atmosphere, an envelope of gases that surround the planet, makes conditions on Earth suitable for living things and influences weather. Water is always moving between the atmosphere (troposphere) and the surface of Earth as a result of the force of gravity and energy from the Sun. The Sun is the driving energy source for heating Earth and for the circulation of Earth's atmosphere.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>6.E.2A.1 Develop and use models to exemplify the properties of the atmosphere (including the gases, temperature and pressure differences, and altitude changes) and the relative scale in relation to the size of Earth.</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 2: Where is the Air? pp. 100-126, FOSSweb Media</p> <p>Weather and Water FOSS Science Resources Book pp. 20-28</p>
<p>6.E.2A.2 Critically analyze scientific arguments based on evidence for and against how different phenomena (natural and human induced) may contribute to the composition of Earth's atmosphere.</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 10: Climate Over Time. pp. 449-494, FOSSweb Media</p> <p>Weather and Water FOSS Science Resources Book pp. 85-88</p>
<p>6.E.2A.3 Construct explanations of the processes involved in the cycling of water through Earth's systems (including transpiration, evaporation, condensation and crystallization, precipitation, and downhill flow of water on land).</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 7: Water in the Air. pp. 321-364 Investigation 9: The Water Planet. pp. 397-423, FOSSweb Media</p> <p>Weather and Water FOSS Science Resources Book pp. 64-68, 74-77</p>

6.E.2B. Conceptual Understanding: The complex patterns of changes and movement of water in the atmosphere determined by winds, landforms, ocean temperatures and currents, and convection are major determinants of local weather patterns and climate. Technology has enhanced our ability to measure and predict weather patterns.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>6.E.2B.1 Analyze and interpret data from weather conditions (including wind speed and direction, air temperature, humidity, cloud types, and air pressure), weather maps, satellites, and radar to predict local weather patterns and conditions.</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 1: What is Weather? pp. 51-86, Investigation 8: Meteorology. pp. 365-381, 395-396, FOSSweb Media</p> <p>Weather and Water FOSS Science Resources Book pp. 3-13, 19, 29-33, 69-70,</p>
<p>6.E.2B.2 Develop and use models to explain how relationships between the movement and interactions of air masses, high and low pressure systems, and frontal boundaries result in weather conditions and storms (including thunderstorms, hurricanes and tornadoes).</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 3: Air Pressure and Wind. pp. 127-164 Investigation 8: Meteorology. pp. 382-394, FOSSweb Media</p> <p>Weather and Water FOSS Science Resources Book pp. 3-13, 58-63</p>
<p>6.E.2B.3 Develop and use models to represent how solar energy and convection impact Earth's weather patterns and climate conditions (including global winds, the jet stream, and ocean currents).</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 4: Convection. pp. 165-215 Investigation 5: Heat Transfer. pp. 217-264 Investigation 6: Air Flow. Investigation Guide pp. 267-318 Investigation 9: The Water Planet. pp. 410-433, FOSSweb Media</p> <p>Weather and Water FOSS Science Resources Book pp. 39, 58-63, 78-82</p>
<p>6.E.2B.4 Construct explanations for how climate is determined in an area (including latitude, elevation, shape of the land, distance from water, global winds, and ocean currents).</p>	<p>FOSS Weather and Water Investigations Guide 2E Investigation 5: Heat Transfer. pp. 217-237 Investigation 9: The Water Planet. pp. 410-447, FOSSweb Media: "The Wonders of Weather" (Video)</p> <p>Weather and Water FOSS Science Resources Book pp. 83-84</p>

GRADE 6

PHYSICAL SCIENCE: ENERGY TRANSFER AND CONSERVATION

Standard 6.P.3: The student will demonstrate an understanding of the properties of energy, the transfer and conservation of energy, and the relationship between energy and forces.

6.P.3A. Conceptual Understanding: Energy manifests itself in multiple forms, such as mechanical (kinetic energy and potential energy), electrical, chemical, radiant (solar), and thermal energy. According to the principle of conservation of energy, energy cannot be created nor destroyed, but it can be transferred from one place to another and transformed between systems.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.P.3A.1 Analyze and interpret data to describe the properties and compare sources of different forms of energy (including mechanical, electrical, chemical, radiant, and thermal).	FOSS Electromagnetic Force Investigations Guide NG Investigation 1: What is Force ,pp. 71-126 Investigation 2: The Force of Magnetism, pp. 127-182 Investigation 3: Electromagnetism, pp. 183-244 Investigation 4: Energy Transfer, pp. 245-296
6.P.3A.2 Develop and use models to exemplify the conservation of energy as it is transformed from kinetic to potential (gravitational and elastic) and vice versa.	FOSS Electromagnetic Force Investigations Guide NG Investigation 2: The Force of Magnetism, pp. 127-182 Investigation 4: Energy Transfer, pp. 245-296
6.P.3A.3 Construct explanations for how energy is conserved as it is transferred and transformed in electrical circuits.	FOSS Electromagnetic Force Investigations Guide NG Investigation 2: The Force of Magnetism, pp. 127-182 Investigation 4: Energy Transfer, pp.245-296
6.P.3A.4 Develop and use models to exemplify how magnetic fields produced by electrical energy flow in a circuit is interrelated in electromagnets, generators, and simple electrical motors.	Foss Electromagnetic Force Investigations Guide NG Investigation 3: Electromagnets , pp. 183-244
6.P.3A.5 Develop and use models to describe and compare the directional transfer of heat through convection, radiation, and conduction.	FOSS Weather and Water Investigations Guide 2E Investigation 4: Convection, pp. 165-215 Investigation 5: Heat Transfer, pp. 217-264 Investigation 6: Air Flow, pp. 267-319
6.P.3A.6 Design and test devices that minimize or maximize heat transfer by conduction, convection, or radiation.	

6.P.3B. Conceptual Understanding: Energy transfer occurs when two objects interact thereby exerting force on each other. It is the property of an object or a system that enables it to do work (force moving an object over a distance). Machines are governed by this application of energy, work, and conservation of energy.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.P.3B.1 Plan and conduct controlled scientific investigations to provide evidence for how the design of simple machines (including levers, pulleys, inclined planes) helps transfer mechanical energy by reducing the amount of force required to do work.	DSM Simple Machines Teacher's Guide Activity 2 (Levers), pp. 19-24, Delta Science Reader, pp. 5-6, 14 Activity 8 (Pulleys), pp. 65-70, Delta Science Reader, pp. 8, 15 Activity 9 (Inclined Planes), pp. 71-76, Delta Science Reader, p. 4
6.P.3B.2 Design and test solutions that improve the efficiency of a machine by reducing the input energy (effort) or the amount of energy transferred to the surrounding environment as it moves an object.	DSM Simple Machines Teacher's Guide Activity 2 (Levers), pp. 19-24, Delta Science Reader, pp. 5-6, 14

GRADE 6

LIFE SCIENCE: DIVERSITY OF LIFE – CLASSIFICATION AND ANIMALS

Standard 6.L.4: The student will demonstrate an understanding of how scientists classify organisms and how the structures, processes, behaviors, and adaptations of animals allow them to survive.

6.L.4A. Conceptual Understanding: Life is the quality that differentiates living things (organisms) from nonliving objects or those that were once living. All organisms are made up of cells, need food and water, a way to dispose of waste, and an environment in which they can live. Because of the diversity of life on Earth, scientists have developed a way to organize groups of organisms according to their characteristic traits, making it easier to identify and study them.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.L.4A.1 Obtain and communicate information to support claims that living organisms (1) obtain and use resources for energy, (2) respond to stimuli, (3) reproduce, and (4) grow and develop.	FOSS Diversity of Life Investigations Guide NG Investigation 1: What is Life? Part 1, What Is Life pp. 98-112
6.L.4A.2 Develop and use models to classify organisms based on the current hierarchical taxonomic structure (including the kingdoms of protists, plants, fungi, and animals).	FOSS Diversity of Life Investigations Guide NG Investigation 9, Part 1: Bioblitz, pp. 588-608 Diversity of Life FOSS Science Resources Book: Biodiversity at Home and Aboard, pp. 90-94

6.L.4B. Conceptual Understanding: The Animal Kingdom includes a diversity of organisms that have many characteristics in common. Classification of animals is based on structures that function in growth, reproduction, and survival. Animals have both structural and behavioral adaptations that increase the chances of reproduction and survival in changing environments.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.L.4B.1 Analyze and interpret data related to the diversity of animals to support claims that all animals (vertebrates and invertebrates) share common characteristics.	FOSS Diversity of Life Investigations Guide NG Investigation 1: What is Life? Part 1: Living or Nonliving, pp. 98-112 Investigation 9, Part 2: What is Life?, pp. 609-624
6.L.4B.2 Obtain and communicate information to explain how the structural adaptations and processes of animals allow for defense, movement, or resource obtainment.	FOSS Diversity of Life Investigations Guide NG Investigation 8: Insects, Part , Structure, Function, and Behavior, pp. 352 – 566 Diversity of Life FOSS Science Resources Book: “Those Amazing Insects,” pp. 81-89
6.L.4B.3 Construct explanations of how animal responses (including hibernation, migration, grouping, and courtship) to environmental stimuli allow them to survive and reproduce.	FOSS Diversity of Life Investigations Guide NG Investigation 1: What is Life?, Part 2: Is Anything Alive in Here, pp. 113-143
6.L.4B.4 Obtain and communicate information to compare and classify innate and learned behaviors in animals.	FOSS Diversity of Life Investigations Guide NG Investigation 8: Insects, Part 1: Structure, Function, and Behavior ,pp. 552-566 Diversity of Life FOSS Science Resources Book: “Those Amazing Insects”, pp. 51-89
6.L.4B.5 Analyze and interpret data to compare how endothermic and ectothermic animals respond to changes in environmental temperature.	FOSS Diversity of Life Investigations Guide NG Investigation 8: Insect Structures and Functions, Part 1: pp. 552-567 Diversity of Life FOSS Science Resources Book: “Those Amazing Insects,” pp. 81-89

GRADE 6

LIFE SCIENCE: DIVERSITY OF LIFE – PROTISTS, FUNGI, AND PLANTS

Standard 6.L.5: The student will demonstrate an understanding of the structures, processes, and responses that allow protists, fungi, and plants to survive and reproduce.

6.L.5A. Conceptual Understanding: The Protist Kingdom is one of the most diverse groups and includes organisms that have characteristics similar to but are not classified as plants, animals, or fungi. These microorganisms live in moist environments and vary in how they obtain energy and move. The Fungi Kingdom consists of organisms that do not make their own food (heterotrophs) but obtain their nutrition through external absorption. Fungi can be grouped by their growth habit or fruiting structure and respond to changes in the environmental stimuli similar to plants.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.L.5A.1 Analyze and interpret data from observations to compare how the structures of protists (including euglena, paramecium, and amoeba) and fungi allow them to obtain energy and explore their environment.	FOSS Diversity of Life Investigations Guide NG Investigation 3: The Cell, Part 2: Paramecia, pp. 222-236 Diversity of Life FOSS Science Resources Book: "The Amazing Paramecium," pp. 14-19
6.L.5A.2 Analyze and interpret data to describe how fungi respond to external stimuli (including temperature, light, touch, water, and gravity).	FOSS Diversity of Life Investigations Guide NG Investigation 4: Domains, Part 3: Fungi, pp. 334-347

6.L.5B. Conceptual Understanding: The Plant Kingdom consists of organisms that primarily make their own food (autotrophs) and are commonly classified based on internal structures that function in the transport of food and water. Plants have structural and behavioral adaptations that increase the chances of reproduction and survival in changing environments.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
6.L.5B.1 Construct explanations of how the internal structures of vascular and nonvascular plants transport food and water.	FOSS Diversity of Life Investigations Guide NG Investigation 5: Plants: The Vascular System, pp. 361-419
6.L.5B.2 Analyze and interpret data to explain how the processes of photosynthesis, respiration, and transpiration work together to meet the needs of plants.	FOSS Diversity of Life Investigations Guide NG Investigation 5: Plants: The Vascular System, Parts 1 and 2, pp. 361-400 Diversity of Life FOSS Science Resources Book: "Water, Light and Energy", pp. 50-57
6.L.5B.3 Develop and use models to compare structural adaptations and processes that flowering plants use for defense, survival and reproduction.	FOSS Diversity of Life Investigations Guide NG Investigation 6: Plant Reproduction and Growth, Parts 3 and 4, pp. 461-486
6.L.5B.4 Plan and conduct controlled scientific investigations to determine how changes in environmental factors (such as air, water, light, minerals, or space) affect the growth and development of a flowering plant.	FOSS Diversity of Life Investigations Guide NG Investigation 6: Plant Reproduction and Growth, Part 2, pp. 448-460
6.L.5B.5 Analyze and interpret data to describe how plants respond to external stimuli (including temperature, light, touch, water, and gravity).	FOSS Diversity of Life Investigations Guide NG Investigation 6: Plant Reproduction and Growth, Part 2, pp. 448-460

GRADE 7

SCIENCE AND ENGINEERING PRACTICES

NOTE: Scientific investigations should always be done in the context of content knowledge expected at this grade level. The standard describes how students should learn and demonstrate knowledge of the content outlined in the other standards.

Standard 7.S.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

7.S.1A. Conceptual Understanding: The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>7.S.1A.1 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge claims.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 1, Part 1: Introducing Milkweed Bugs p. 61 -85 Investigation 1, Part 3: Observing Milkweed-Bug Habitats ,p. 93 - 101 Investigation 2, Part 1: Ecosystem Card Sort, pp. 123 - 131 Investigation 6, Part 3: Trophic Levels, pp. 344 - 363 Investigation 7, Part 3: Population Dynamics, pp. 411 - 424 Investigation 9: Ecoscenarios, pp. 479 -513</p> <p>Populations and Ecosystems FOSS Science Resources Book pp. 3-4, 30-40</p>
<p>7.S.1A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 1: Introducing Milkweed Bugs pp. 57 - 101 Investigation 2, Part 1: Ecosystem Card Sort pg. 123 – 131 Investigation 4: The Physical environment pp. 207 - 251 Investigation 6, Part 3: Trophic Levels pp. 344 - 363 Investigation 7, Part 3: Population Dynamics pp. 411-424 Investigation 9: Ecoscenarios, pp. 479 - 513</p> <p>Populations and Ecosystems FOSS Science Resources Book: “Biosphere 2, An Experiment in Isolation”, pp. 30-40</p>
<p>7.S.1A.3 Plan and conduct controlled scientific investigation to answer questions, test hypotheses, and develop explanations: (1) formulate scientific questions and testable hypotheses, (2) identify materials, procedures, and variables, (3) select and use appropriate tools or instruments to collect qualitative and quantitative data, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 4: The Physical Environment pp 207 -251 Investigation 5, Part 4: Energy Transfer from Food pp. 294-309 Investigation 9: Ecoscenarios pp. 479 - 513</p>
<p>7.S.1A.4. Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to (1) reveal patterns and construct meaning or (2) support hypotheses, explanations, claims, or designs.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 4, Part 3: Observing Minihabitats pp. 242-251 Investigation 5: Producers pp. 253-309 Investigation 6, Part 3: Trophic Levels pp. 344-362 Investigation 7, Part 3: Population Dynamics pp. 411-424 Investigation 9: Ecoscenarios pp. 479-513</p>
<p>7.S.1A.5 Use mathematical and computational thinking to (1) use and manipulate appropriate metric units, (2) collect and analyze data, (3) express relationships between variables for models and investigations, or (4) use grade-level appropriate statistics to analyze data.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 5, Part 4: Energy Transfer from Food pp.294-309 Investigation 6, Part 2: Food Chain Game pp, 329-343 Investigation 6, Part 3: Trophic Levels pp. 344-363 Investigation 7: Population Size pp. 373-424</p> <p>FOSSweb Media</p>

<p>7.S.1A.6 Construct explanations of phenomena using (1) primary or secondary scientific evidence and models, (2) conclusions from scientific investigations, (3) predictions based on observations and measurements, or (4) data communicated in graphs, tables, or diagrams.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 3: Mono Lake p. 157-204 Investigation 5, Part 4: Energy Transfer from Food pp. 294-309 Investigation 6, Part 1: Using Energy pp. 321-328 Investigation 6, Part 2: Food-Chain Game pp. 329-343 Investigation 6, Part 3: Trophic Levels pp. 344-363 Investigation 7, Part 1: Reproductive Potential pp. 383-396 Investigation 7, Part 3: Population Dynamics pp. 411-424 Investigation 9: Ecoscenarios pp. 479-513</p>
<p>7.S.1A.7 Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 3: Mono Lake pp. 157-204 Investigation 6, Part 2: Food-Chain Game pp.329-343 Investigation 6, Part 3: Trophic Levels pp. 344-363 Investigation 7, Part 1: Reproductive Potential pp. 383-396 Investigation 7, Part 3: Population Dynamics pp. 411-424 Investigation 9: Ecoscenarios pp. 479-513</p> <p>Populations and Ecosystems FOSS Science Resources Book pp. 30-40</p>
<p>7.S.1A.8 Obtain and evaluate scientific information to (1) answer questions, (2) explain or describe phenomena, (3) develop models, (4) evaluate hypotheses, explanations, claims, or designs or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate primary or secondary scientific literature, or (2) reporting the results of student experimental investigations.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 3: Mono Lake pp. 157-204 Investigation 4, Part 3: Observing Minihabitats pp. 242-251 Investigation 5, Part 4: Energy Transfer from food pp. 294-309 Investigation 6, Part 1: Using Energy pp. 321-328 Investigation 6, Part 3: Trophic Levels pp. 344-363 Investigation 7, Part 1: Reproductive Potential pp. 383-396 Investigation 7, Part 3: Population Dynamics pp. 411-424 Investigation 9: Ecoscenarios pp. 479-513</p> <p>Populations and Ecosystems FOSS Science Resources Book</p>

7.S.1B. Conceptual Understanding: Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>7.S.1B.1 Construct devices or design solutions using scientific knowledge to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the device or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem and refine the design if needed, and (6) communicate the results.</p>	<p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 3: Mono Lake pp.157 - 204 Investigation 5, Part 4: Energy Transfer from Food pp. 294 - 309 Investigation 6, Part 3: Trophic Levels pp. 344 - 363 Investigation 7, Part 1: Reproductive Potential pp. 383 - 396 Investigation 7, Part 3: Population Dynamics pp. 411 - 424 Investigation 9: Ecoscenarios pp.479-513</p> <p>FOSS Chemical Interactions Investigations Guide 2E Investigation 6: Thermos Engineering, pp. 275 – 305</p> <p>Chemical Interactions FOSS Science Resources Book pp.36-39, 110-112</p>

GRADE 7

PHYSICAL SCIENCE: CLASSIFICATION AND CONSERVATION OF MATTER

Standard 7.P.2: The student will demonstrate an understanding of the structure and properties of matter and that matter is conserved as it undergoes changes.

7.P.2A. Conceptual Understanding: All substances are composed of one or more elements. Elements are pure substances which contain only one kind of atom. The periodic table organizes these elements based on similar properties. Compounds are substances composed of two or more elements. Chemical formulas can be used to describe compounds.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
7.P.2A.1 Develop and use simple atomic models to illustrate the components of elements (including the relative position and charge of protons, neutrons, and electrons).	FOSS Chemical Interactions Investigations Guide 2E Investigation 9: Reactions, pp. 405-463 Investigation 10: More Reactions, pp. 465-490 Chemical Interactions FOSS Science Resources Book pp. 63-79, 102-109 FOSSweb Media: "Atoms and Molecules" (Video)
7.P.2A.2 Obtain and use information about elements (including chemical symbol, atomic number, atomic mass, and group or family) to describe the organization of the periodic table.	FOSS Chemical Interactions Investigations Guide 2E Investigation 2: Elements, pp. 91-129 Investigation 10: More Reactions, pp. 465-490 Chemical Interactions FOSS Science Resources Book pp. 3-13, 102-109 FOSSweb Media: "Atoms and Molecules" (Video)
7.P.2A.3 Analyze and interpret data to describe and classify matter as pure substances (elements or compounds) or mixtures (heterogeneous or homogeneous) based on composition.	FOSS Chemical Interactions Investigations Guide 2E Investigation 1: Substances, pp. 33-89 Investigation 7: Solutions pp. 307-341 Chemical Interactions FOSS Science Resources Book pp. 3-15,40-51,82-85
7.P.2A.4 Construct explanations for how compounds are classified as ionic (metal bonded to nonmetal) or covalent (nonmetals bonded together) using chemical formulas.	FOSS Chemical Interactions Investigations Guide 2E Investigation 9: Reactions, Investigation Guide pp. 405-464 Chemical Interactions FOSS Science Resources Book pp. 63-85, 102-103,

7.P.2B. Conceptual Understanding: Substances (such as metals or acids) are identified according to their physical or chemical properties. Changes to substances can either be physical or chemical. Many substances react chemically with other substances to form new substances with different properties. According to the law of conservation of matter, total mass does not change in a chemical reaction.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>7.P.2B.1 Analyze and interpret data to describe substances using physical properties (including state, boiling/melting point, density, conductivity, color, hardness, and magnetic properties) and chemical properties (the ability to burn or rust).</p>	<p>FOSS Chemical Interactions Investigations Guide 2E Investigation 1: Substances, pp. 33-89 Investigation 8: Phase Change, pp.343-403 Investigation 7: Solutions, pp. 317-341</p> <p>Chemical Interactions FOSS Science Resources Book pp. 42-48, 54-62, 97-10</p>
<p>7.P.2B.2 Use mathematical and computational thinking to describe the relationship between the mass, volume, and density of a given substance.</p>	<p>FOSS Chemical Interactions Investigations Guide 2E Investigation 3: Particles, pp. 133 - 179</p> <p>Chemical Interactions FOSS Science Resources Book pp. 16 -17, 18 -25</p>
<p>7.P.2B.3 Analyze and interpret data to compare the physical properties, chemical properties (neutralization to form a salt, reaction with metals), and pH of various solutions and classify solutions as acids or bases.</p>	<p>FOSS Chemical Interactions Investigations Guide 2E Investigation 9: Reactions, pp. 405-463</p> <p>Chemical Interactions FOSS Science Resources Book pp. 63-85,</p>
<p>7.P.2B.4 Plan and conduct controlled scientific investigations to answer questions about how physical and chemical changes affect the properties of different substances.</p>	<p>FOSS Chemical Interactions Investigations Guide 2E Investigation 8: Phase Change, pp. 343-403 Investigation 9: Reactions, pp. 405-463</p> <p>Chemical Interactions FOSS Science Resources Book p. 40-51,52-62, 63-81,</p>
<p>7.P.2B.5 Develop and use models to explain how chemical reactions are supported by the law of conservation of matter.</p>	<p>FOSS Chemical Interactions Investigations Guide 2E Investigation 9: Reactions, pp. 405-463</p> <p>Chemical Interactions FOSS Science Resources Book pp. 63-79,</p>

GRADE 7

LIFE SCIENCE: ORGANIZATION IN LIVING SYSTEMS

Standard 7.L.3: The student will demonstrate an understanding of how the levels of organization within organisms support the essential functions of life.

7.L.3A. Conceptual Understanding: Cells are the most basic unit of any living organism. All organisms are composed of one (unicellular) or many cells (multicellular) and require food and water, a way to dispose of waste, and an environment in which they can live in order to survive. Through the use of technology, scientists have discovered special structures within individual cells that have specific functions that allow the cell to grow, survive, and reproduce. Bacteria are one-celled organisms found almost everywhere and can be both helpful and harmful. They can be simply classified by their size, shape and whether or not they can move.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>7.L.3A.1 Obtain and communicate information to support claims that (1) organisms are made of one or more cells, (2) cells are the basic unit of structure and function of organisms, and (3) cells come only from existing cells.</p>	<p><i>This standard is met at Grade 6 with FOSS Diversity of Life NG:</i> FOSS Diversity of Life Investigations Guide NG Investigation 3: Cells pp. 193-2267 Diversity of Life FOSS Science Resources Book pp. 20-27</p>
<p>7.L.3A.2 Analyze and interpret data from observations to describe different types of cells and classify cells as plant, animal, protist, or bacteria.</p>	<p><i>This standard is met at Grade 6 with FOSS Diversity of Life NG:</i> FOSS Diversity of Life Investigations Guide NG Investigations 3,4,5,8 pp. 193-267, 269-359, 361-420,537-575</p>
<p>7.L.3A.3 Develop and use models to explain how the relevant structures within cells (including cytoplasm, cell membrane, cell wall, nucleus, mitochondria, chloroplasts, lysosomes, and vacuoles) function to support the life of plant, animal, and bacterial cells.</p>	<p><i>This standard is met at Grade 6 with FOSS Diversity of Life NG:</i> FOSS Diversity of Life Investigations Guide NG Investigations 3, 4, 5, 8 pp. 193-267, 269-359, 361-420,537-575</p>
<p>7.L.3A.4 Construct scientific arguments to support claims that bacteria are both helpful and harmful to other organisms and the environment.</p>	<p><i>This standard is met at Grade 6 with FOSS Diversity of Life NG:</i> FOSS Diversity of Life Investigations Guide NG Investigation 4, Part 2: Bacteria pp 305-333 Diversity of Life FOSS Science Resources Book: "Bacteria Around Us" pp 28-35 "Harmful and Helpful Bacteria" pp 36-43</p> <p>FOSS Populations and Ecosystems Investigations Guide 2E Investigation 4, Part 3: Observing Miniecosystems p. 242 Investigation 6, Part 4: Decomposers p. 364</p>

7.L.3B. Conceptual Understanding: Multicellular organisms (including humans) are complex systems with specialized cells that perform specific functions. Organs and organ systems are composed of cells that function to serve the needs of cells which in turn serve the needs of the organism.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>7.L.3B.1 Develop and use models to explain how the structural organizations within multicellular organisms function to serve the needs of the organism.</p>	<p><i>This standard is met at Grade 6 with FOSS Diversity of Life NG:</i> FOSS Diversity of Life Investigations Guide NG Investigation 5: Plants, The Vascular System pp. 361-418 Diversity of Life FOSS Science Resources Book pp. 50-57</p>
<p>7.L.3B.2 Construct explanations for how systems in the human body (including circulatory, respiratory, digestive, excretory, nervous, and musculoskeletal systems) work together to support the essential life functions of the body.</p>	<p>FOSS Human Systems Interactions Investigations Guide NG Investigation 1: Systems Connections, pp. 59-97</p> <p>Human Systems Interactions FOSS Science Resources Book: "Human Organ Systems" pp. 2-49</p>

GRADE 7

LIFE SCIENCE: HEREDITY - INHERITANCE AND VARIATION OF TRAITS

Standard 7.L.4: The student will demonstrate an understanding of how genetic information is transferred from parent to offspring and how environmental factors and the use of technologies influence the transfer of genetic information.

7.L.4A. Conceptual Understanding: Inheritance is the key process causing similarities between parental organisms and their offspring. Organisms that reproduce sexually transfer genetic information (DNA) to their offspring. This transfer of genetic information through inheritance leads to greater similarity among individuals within a population than between populations. Technology allows humans to influence the transfer of genetic information.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
7.L.4A.1 Obtain and communicate information about the relationship between genes and chromosomes to construct explanations of their relationship to inherited characteristics.	FOSS Heredity and Adaptation Investigations Guide NG Investigation 2: Heredity, pp. 119-212
7.L.4A.2 Construct explanations for how genetic information is transferred from parent to offspring in organisms that reproduce sexually.	FOSS Heredity and Adaptation Investigations Guide NG Investigation 2: Heredity, pp. 119-212
7.L.4A.3 Develop and use models (Punnett squares) to describe and predict patterns of the inheritance of single genetic traits from parent to offspring (including dominant and recessive traits, incomplete dominance, and codominance).	FOSS Heredity and Adaptation Investigations Guide NG Investigation 2: Heredity, pp. 119-212
7.L.4A.4 Use mathematical and computational thinking to predict the probability of phenotypes and genotypes based on patterns of inheritance.	FOSS Heredity and Adaptation Investigations Guide NG Investigation 2: Heredity, pp. 119-212
7.L.4A.5 Construct scientific arguments using evidence to support claims for how changes in genes (mutations) may have beneficial, harmful, or neutral effects on organisms.	FOSS Heredity and Adaptation Investigations Guide NG Investigation 3: Evolution, pp. 215-289
7.L.4A.6 Construct scientific arguments using evidence to support claims concerning the advantages and disadvantages of the use of technology (such as selective breeding, genetic engineering, or biomedical research) in influencing the transfer of genetic information.	FOSS Heredity and Adaptation Investigations Guide NG Investigation 3: Evolution, pp. 215-289

GRADE 7

ECOLOGY: INTERACTIONS OF LIVING SYSTEMS AND THE ENVIRONMENT

Standard 7.EC.5: The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments.

7.EC.5A. Conceptual Understanding: In all ecosystems, organisms and populations of organisms depend on their environmental interactions with other living things (biotic factors) and with physical (abiotic) factors (such as light, temperature, water, or soil quality). Disruptions to any component of an ecosystem can lead to shifts in its diversity and abundance of populations.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
7.EC.5A.1 Develop and use models to describe the characteristics of the levels of organization within ecosystems (including species, populations, communities, ecosystems, and biomes).	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 2: Sorting Out Life, pp. 103-154 Populations and Ecosystems FOSS Science Resources Book pp. 9-10, 23-24
7.EC.5A.2 Construct explanations of how soil quality (including composition, texture, particle size, permeability, and pH) affects the characteristics of an ecosystem using evidence from soil profiles.	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 4, Part 1: The Physical Environment pp.219-229 Investigation 4, Part 2: Introducing Life pp.230-241 Investigation 9: Ecoscenarios Poster Presentations Abiotic Factors & Interactions
7.EC.5A.3 Analyze and interpret data to predict changes in the number of organisms within a population when certain changes occur to the physical environment (such as changes due to natural hazards or limiting factors).	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 7: Population Size, Investigation Guide pp. 373-424 Populations and Ecosystems FOSS Science Resources Book pp. 65-73

7.EC.5B. Conceptual Understanding: Organisms in all ecosystems interact with and depend upon each other. Organisms with similar needs compete for limited resources. Food webs and energy pyramids are models that demonstrate how energy is transferred within an ecosystem.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
7.EC.5B.1 Develop and use models to explain how organisms interact in a competitive or mutually beneficial relationship for food, shelter, or space (including competition, mutualism, commensalism, parasitism, and predator-prey relationships).	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 9: Ecoscenarios, pp. 199-218, (with modification of Ecoscenarios Project Guidelines) Populations and Ecosystems FOSS Science Resources Book pp. 30-45
7.EC.5B.2 Develop and use models (food webs and energy pyramids) to exemplify how the transfer of energy in an ecosystem supports the concept that energy is conserved.	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 3: Mono Lake, pp. 157-205 , FOSSweb Media; Investigation 5: Energy Transfer from Food , pp. 294-309 Populations and Ecosystems FOSS Science Resources Book pp. 25-29 , 50-54
7.EC.5B.3 Analyze and interpret data to predict how changes in the number of organisms of one species affects the balance of an ecosystem.	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 7: Population Size, pp. 373-424 Populations and Ecosystems FOSS Science Resources Book pp. 22-29
7.EC.5B.4 Define problems caused by the introduction of a new species in an environment and design devices or solutions to minimize the impact(s) to the balance of an ecosystem.	FOSS Populations and Ecosystems Investigations Guide 2E Investigation 6: Population Size, pp. 171-198, FOSSweb Media Populations and Ecosystems FOSS Science Resources Book pp. 65-71, 72-73

GRADE 8

SCIENCE AND ENGINEERING PRACTICES

NOTE: Scientific investigations should always be done in the context of content knowledge expected at this grade level. The standard describes how students should learn and demonstrate knowledge of the content outlined in the other standards.

Standard 8.S.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

8.S.1A. Conceptual Understanding: The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.S.1A.1 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge claims.	FOSS Earth History Investigations Guide 2E Investigations 1 through 9 Example: Investigation 5, Part 3: Types of Igneous Rocks, pp. 333-342
8.S.1A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.	FOSS Earth History Investigations Guide 2E Investigation 1, Part 3: Correlating Grand Canyon Rocks, pp. 94-108 Investigation 3, Part 2: Limestone, pp. 214-223 Investigation 4, Part 3: Student Time Lines, pp. 275-283 Investigation 6, Part 1: Mapping Volcanoes and Earthquakes, pp. 361-372 Investigation 7, Part 1: Plate Models, pp. 423-442
8.S.1A.3 Plan and conduct controlled scientific investigations to answer questions, test hypotheses, and develop explanations: (1) formulate scientific questions and testable hypotheses, (2) identify materials, procedures, and variables, (3) select and use appropriate tools or instruments to collect qualitative and quantitative data, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.	FOSS Earth History Investigations Guide 2E Investigation 5, Part 2: Salol Crystals, pp. 321-332 Investigation 7, Part 3: Metamorphic Rocks, pp. 451-471
8.S.1A.4 Analyze and interpret data from informational texts, observations, measurements, or investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to (1) reveal patterns and construct meaning or (2) support hypotheses, explanations, claims, or designs.	FOSS Earth History Investigations Guide 2E Investigation 1, Part 3: Correlating Grand Canyon Rocks, pp. 94-108 Investigation 3, Part 2: Limestone, pp. 214-223 Investigation 5, Part 3: Types of Igneous Rocks, pp. 333-342 Investigation 6, Part 1: Mapping Volcanoes and Earthquakes, pp. 361-372 Investigation 7, Part 2: Mountains, pp. 443-450
8.S.1A.5 Use mathematical and computational thinking to (1) use and manipulate appropriate metric units, (2) collect and analyze data, (3) express relationships between variables for models and investigations, or (4) use grade-level appropriate statistics to analyze data.	FOSS Earth History Investigations Guide 2E Investigation 2, Part 1: Sorting Earth Materials, pp. 125-130 Investigation 4, Part 3: Student Time Lines, pp. 275-284
8.S.1A.6 Construct explanations of phenomena using (1) primary or secondary scientific evidence and models, (2) conclusions from scientific investigations, (3) predictions based on observations and measurements, or (4) data communicated in graphs, tables, or diagrams.	FOSS Earth History Investigations Guide 2E Investigation 5, Part 1: Earth's Layers, pp. 314-320 Investigation 5, Part 3: Types of Igneous Rocks, pp. 333-342 Investigation 6, Part 1: Mapping Volcanoes and Earthquakes, pp. 361-372 Investigation 7, Part 1: Plate Models, pp. 423-442
8.S.1A.7 Construct and analyze scientific arguments to support claims, explanations, or designs using evidence from observations, data, or informational texts.	FOSS Earth History Investigations Guide 2E Investigation 7, Part 1: Plate Models, pp. 423-442 Investigation 8, Part 1: Introduction to the Project, pp. 489-499 Investigation 8, Part 2: Research and Writing, pp. 500-509

<p>8.S.1A.8 Obtain and evaluate scientific information to (1) answer questions, (2) explain or describe phenomena, (3) develop models, (4) evaluate hypotheses, explanations, claims, or designs or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate primary or secondary scientific literature, or (2) reporting the results of student experimental investigations.</p>	<p>FOSS Earth History Investigations Guide 2E Investigation 8, Part 1: Introduction to the Project, pp. 489-499 Investigation 8, Part 2: Research and Writing, pp. 500-509 Investigation 9, Part 2: Review the Evidence, pp. 530-548</p>
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8.S.1B. Conceptual Understanding: Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
<p>8.S.1B.1 Construct devices or design solutions using scientific knowledge to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the device or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem and refine the design if needed, and (6) communicate the results.</p>	<p>FOSS Earth History Investigations Guide 2E Investigation 8, Part 2: Research and Writing, pp. 500-509 Investigation 8, Part 3: Presentations, pp. 510-516</p>

GRADE 8

PHYSICAL SCIENCE: FORCES AND MOTION

Standard 8.P.2: The student will demonstrate an understanding of the effects of forces on the motion and stability of an object.

8.P.2A. Conceptual Understanding: Motion occurs when there is a change in position of an object with respect to a reference point. The final position of an object is determined by measuring the change in position and direction of the segments along a trip. While the speed of the object may vary during the total time it is moving, the average speed is the result of the total distance divided by the total time taken. Forces acting on an object can be balanced or unbalanced. Varying the amount of force or mass will affect the motion of an object. Inertia is the tendency of objects to resist any change in motion.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.P.2A.1 Plan and conduct controlled scientific investigations to test how varying the amount of force or mass of an object affects the motion (speed and direction), shape, or orientation of an object.	FOSS Force and Motion Teacher Guide 1E Investigation 5: Acceleration, Part 4: Cars and Loads pp. 194-20 Force and Motion FOSS Science Resources Book pp. 36-49
8.P.2A.2 Develop and use models to compare and predict the resulting effect of balanced and unbalanced forces on an object's motion in terms of magnitude and direction.	<i>This standard is met at Grade 6 with FOSS Electromagnetic Force:</i> FOSS Electromagnetic Force Investigations Guide NG Investigation 1: What is Force?, pp. 71 -126
8.P.2A.3 Construct explanations for the relationship between the mass of an object and the concept of inertia (Newton's First Law of Motion).	FOSS Force and Motion Teacher Guide 1E Investigation 6: Force, pp. 203-245 Force and Motion FOSS Science Resources Book pp. 50-61
8.P.2A.4 Analyze and interpret data to support claims that for every force exerted on an object there is an equal force exerted in the opposite direction (Newton's Third Law of Motion).	FOSS Force and Motion Teacher Guide 1E Investigation 6: Force, Part 3: Forces in Action, Part 4: Multimedia Force Bench, pp. 236-245 Force and Motion FOSS Science Resources Book pp. 50-61
8.P.2A.5 Analyze and interpret data to describe and predict the effects of forces (including gravitational and friction) on the speed and direction of an object.	<i>This standard is met at Grade 6 with FOSS Electromagnetic Force:</i> FOSS Electromagnetic Force Investigations Guide NG Investigation 1: What is Force?, pp. 71 -126
8.P.2A.6 Use mathematical and computational thinking to generate graphs that represent the motion of an object's position and speed as a function of time.	FOSS Force and Motion Teacher Guide 1E Investigation 2: Speed, pp. 67-99 Investigation 3: Comparing Speeds, pp. 101-128 Investigation 4: Representing Motion, pp. 129-156 Force and Motion FOSS Science Resources Book pp. 1-31
8.P.2A.7 Use mathematical and computational thinking to describe the relationship between the speed and velocity (including positive and negative expression of direction) of an object in determining average speed ($v=d/t$).	FOSS Force and Motion Teacher Guide 1E Investigation 2: Speed, Part 3: Measuring Time and Distance pp. 89-99 Investigation 3: Comparing Speeds pp. 101-128 Investigation 5: Acceleration, Part 1: Faster and Faster, Part 2: Mechanical Dotcar, Part 3: Dots and Motion pp. 157-193 Force and Motion FOSS Science Resources Book pp. 7-16, 32-40

GRADE 8

PHYSICAL SCIENCE: WAVES

Standard 8.P.3: The student will demonstrate an understanding of the properties and behaviors of waves.

8.P.3A. Conceptual Understanding: Waves (including sound and seismic waves, waves on water, and light waves) have energy and transfer energy when they interact with matter. Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter. All types of waves have some features in common. When waves interact, they superimpose upon or interfere with each other resulting in changes to the amplitude. Major modern technologies are based on waves and their interactions with matter.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.P.3A.1 Construct explanations of the relationship between matter and energy based on the characteristics of mechanical and light waves.	FOSS Waves Investigations Guide NG Investigation 1: Making Waves, pp. 67-99 Investigation 2: Wave Energy, pp. 101-161 Investigation 3: Light Waves, pp. 163-227
8.P.3A.2 Develop and use models to exemplify the basic properties of waves (including frequency, amplitude, wavelength, and speed).	FOSS Waves Investigations Guide NG Investigation 1: Making Waves, pp. 67-99
8.P.3A.3 Analyze and interpret data to describe the behavior of waves (including refraction, reflection, transmission, and absorption) as they interact with various materials.	FOSS Waves Investigations Guide NG Investigation 2: Wave Energy, pp. 101-161 Investigation 3: Light Waves, pp. 163- 227
8.P.3A.4 Analyze and interpret data to describe the behavior of mechanical waves as they intersect.	FOSS Waves Investigations Guide NG Investigation 1: Making Waves, pp. 67-99
8.P.3A.5 Construct explanations for how humans see color as a result of the transmission, absorption, and reflection of light waves by various materials.	FOSS Waves Investigations Guide NG Investigation 3: Light Waves, pp. 163-227
8.P.3A.6 Obtain and communicate information about how various instruments are used to extend human senses by transmitting and detecting waves (such as radio, television, cell phones, and wireless computer networks) to exemplify how technological advancements and designs meet human needs.	FOSS Waves Investigations Guide NG Investigation 4: Communication Waves, pp. 229-277

GRADE 8

EARTH SCIENCE: EARTH'S PLACE IN THE UNIVERSE

Standard 8.E.4: The student will demonstrate an understanding of the universe and the predictable patterns caused by Earth's movement in the solar system.

8.E.4A. Conceptual Understanding: Earth's solar system is part of the Milky Way Galaxy, which is one of many galaxies in the universe. The planet Earth is a tiny part of a vast universe that has developed over a span of time beginning with a period of extreme and rapid expansion.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.4A.1 Obtain and communicate information to model the position of the Sun in the universe, the shapes and composition of galaxies, and the measurement unit needed to identify star and galaxy locations.	FOSS Planetary Science Investigations Guide 2E Investigation 7: Beyond the Moon, Part 1: What's Out There? pp. 304 - 320 Investigation 8: The Solar System, Part 1: Where are the Planets? pp. 362 - 364 Planetary Science FOSS Science Resources Book pp. 45-53, 58 – 76, 108-119
8.E.4A.2 Construct and analyze scientific arguments to support claims that the universe began with a period of extreme and rapid expansion using evidence from the composition of stars and gases and the motion of galaxies in the universe.	FOSS Planetary Science Investigations Guide 2E Investigation 7: Beyond the Moon, Part 2: Origins pp. 322 - 337

8.E.4B. Conceptual Understanding: Earth's solar system consists of the Sun and other objects that are held in orbit around the Sun by its gravitational pull on them. Motions within the Earth-Moon-Sun system have effects that can be observed on Earth.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.4B.1 Obtain and communicate information to model and compare the characteristics and movements of objects in the solar system (including planets, moons, asteroids, comets, and meteors).	FOSS Planetary Science Investigations Guide 2E Investigation 6: Craters, pp. 243 - 286 Investigation 7: Beyond the Moon, Part 1: What's Out There?, pp. 304 - 321 Investigation 8: The Solar System, Part 1: Where are the Planets?, pp. 352 - 364 Planetary Science FOSS Science Resources Book pp. 31-41, 45-53, 58-67, 92-119
8.E.4B.2 Construct explanations for how gravity affects the motion of objects in the solar system and tides on Earth.	FOSS Planetary Science Investigations Guide 2E Investigation 7: Beyond the Moon, Part 2: Origins, pp. 322 - 337 Planetary Science FOSS Science Resources Book pp. 54-57
8.E.4B.3 Develop and use models to explain how seasons, caused by the tilt of Earth's axis as it orbits the Sun, affects the length of the day and the amount of heating on Earth's surface.	FOSS Planetary Science Investigations Guide 2E Investigation 3: Seasons, pp. 123-167 Planetary Science FOSS Science Resources Book pp. 10-13, 85
8.E.4B.4 Develop and use models to explain how motions within the Sun-Earth-Moon system cause Earth phenomena (including day and year, moon phases, solar and lunar eclipses, and tides).	FOSS Planetary Science Investigations Guide 2E Investigation 1: Where Am I?, Part 2: Moon Watch, pp. 72-80 Investigation 2: A Round, Spinning Earth, Part 2: Earth/Sun Relationship pp. 108 - 120 Investigation 4: Moon Study, Part 2: How Big/How Far? pp. 190-199 Investigation 5: Phases of the Moon, pp. 203-241 FOSSweb Media Planetary Science FOSS Science Resources Book pp. 19-30, 88-91

<p>8.E.4B.5 Obtain and communicate information to describe how data from technologies (including telescopes, spectroscopes, satellites, space probes) provide information about objects in the solar system and the universe.</p>	<p>FOSS Planetary Science Investigations Guide 2E Investigation 9: Space Exploration, pp. 387-417 Investigation 10: Orbits and New Worlds, Part 2: Looking for Planets pp. 440 - 452</p> <p>Planetary Science FOSS Science Resources Book pp. 68-76, 120-132</p>
<p>8.E.4B.6 Analyze and interpret data from the surface features of the Sun (including photosphere, corona, sunspots, prominences, and solar flares) to predict how these features may affect Earth.</p>	<p>FOSS Planetary Science Investigations Guide 2E FOSSweb Media: Planetary Science / Digital-Only Resources / Multimedia / Binders Index / Sun</p>

GRADE 8

EARTH SCIENCE: EARTH SYSTEMS AND RESOURCES

Standard 8.E.5: The student will demonstrate an understanding of the processes that alter the structure of Earth and provide resources for life on the planet.

8.E.5A. Conceptual Understanding: All Earth processes are the result of energy flowing and matter cycling within and among Earth’s systems. Because Earth’s processes are dynamic and interactive in nature, the surface of Earth is constantly changing. Earth’s hot interior is a main source of energy that drives the cycling and moving of materials. Plate tectonics is the unifying theory that explains the past and current crustal movements at the Earth’s surface. This theory provides a framework for understanding geological history.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.5A.1 Develop and use models to explain how the processes of weathering, erosion, and deposition change surface features in the environment.	FOSS Earth History Investigations Guide 2E Investigation 2: Weathering and Erosion, pp. 109-192 Investigation 3: Deposition, pp. 193-236 Earth History FOSS Science Resources Book pp. 12-36
8.E.5A.2 Use the rock cycle model to describe the relationship between the processes and forces that create igneous, sedimentary, and metamorphic rocks.	FOSS Earth History Investigations Guide 2E Investigation 5: Igneous Rocks, pp. 301-342, FOSSweb Media Investigation 7: Mountains and Metamorphic Rocks, Part 3: Metamorphic Rocks, pp. 451-471 Earth History FOSS Science Resources Book pp. 78-80
8.E.5A.3 Obtain and communicate information about the relative position, density, and composition of Earth’s layers to describe the crust, mantle, and core.	FOSS Earth History Investigations Guide 2E Investigation 5: Igneous Rocks, Part 1, pp. 301-320, FOSSweb Media
8.E.5A.4 Construct explanations for how the theory of plate tectonics accounts for (1) the motion of lithospheric plates, (2) the geologic activities at plate boundaries, and (3) the changes in landform areas over geologic time.	FOSS Earth History Investigations Guide 2E Investigation 6: Volcanoes and Earthquakes, pp. 345-402 Investigation 7: Mountains and Metamorphic Rocks, pp. 405-450 Earth History FOSS Science Resources Book pp. 66-75
8.E.5A.5 Construct and analyze scientific arguments to support claims that plate tectonics accounts for (1) the distribution of fossils on different continents, (2) the occurrence of earthquakes, and (3) continental and ocean floor features (including mountains, volcanoes, faults and trenches).	FOSS Earth History Investigations Guide 2E Investigation 6: Volcanoes and Earthquakes, Part 3: Plate Tectonics, pp. 380-402 Investigation 7: Mountains and Metamorphic Rocks, Part 1: Plate Models, pp. 423-441 Earth History FOSS Science Resources Book pp. 66-75

8.E.5B. Conceptual Understanding: Natural processes can cause sudden or gradual changes to Earth’s systems. Some may adversely affect humans such as volcanic eruptions or earthquakes. Mapping the history of natural hazards in a region, combined with an understanding of related geological forces can help forecast the locations and likelihoods of future events.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.5B.1 Analyze and interpret data to describe patterns in the location of volcanoes and earthquakes related to tectonic plate boundaries, interactions, and hot spots.	FOSS Earth History Investigations Guide 2E Investigation 6: Volcanoes and Earthquakes, pp. 345-402 Investigation 8: Geoscenarios, pp. 481-516 Earth History FOSS Science Resources Book pp. 66-72, 90-93,159-161
8.E.5B.2 Construct explanations of how forces inside Earth result in earthquakes and volcanoes.	FOSS Earth History Investigations Guide 2E Investigation 6: Volcanoes and Earthquakes, Part 3: Plate Tectonics, pp. 380-400 Earth History FOSS Science Resources Book pp. 66-72
8.E.5B.3 Define problems that may be caused by a catastrophic event resulting from plate movements and design possible devices or solutions to minimize the effects of that event on Earth’s surface and/or human structures.	FOSS Earth History Investigations Guide 2E Investigation 6: Volcanoes and Earthquakes, Investigation Guide, Extensions pp. 401 FOSSweb Media

8.E.5C. Conceptual Understanding: Humans depend upon many Earth resources – some renewable over human lifetimes and some nonrenewable or irreplaceable. Resources are distributed unevenly around the planet as a result of past geological processes.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.5C.1 Obtain and communicate information regarding the physical and chemical properties of minerals, ores, and fossil fuels to describe their importance as Earth resources.	FOSS Earth History Investigations Guide 2E Investigation 3: Deposition, Part 2: Limestone, pp. 214-223 Investigation 5: Igneous Rocks, pp. 314 -341 Investigation 8: Geoscenarios, pp. 481-518 Earth History FOSS Science Resources Book pp. 31-36, 61-64, 81-97, 156

GRADE 8

EARTH SCIENCE: EARTH'S HISTORY AND DIVERSITY OF LIFE

Standard 8.E.6: The student will demonstrate an understanding of Earth's geologic history and its diversity of life over time.

8.E.6A. Conceptual Understanding: The geologic time scale interpreted from rock strata provides a way to organize major historical events in Earth's history. Analysis of rock strata and the fossil record, which documents the existence, diversity, extinction, and change of many life forms throughout history, provide only relative dates, not an absolute scale. Changes in life forms are shaped by Earth's varying geological conditions.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.6A.1 Develop and use models to organize Earth's history (including era, period, and epoch) according to the geologic time scale using evidence from rock layers.	FOSS Earth History Investigations Guide 2E Investigation 4: Fossils and Past Environments, Parts 1-3, pp. 237-284 Earth History FOSS Science Resources Book pp. 41-60
8.E.6A.2 Analyze and interpret data from index fossil records and the ordering of rock layers to infer the relative age of rocks and fossils.	FOSS Earth History Investigations Guide 2E Investigation 4: Fossils and Past Environments, Part 4: Index Fossils, pp. 285-300 Earth History FOSS Science Resources Book pp. 48-60
8.E.6A.3 Construct explanations from evidence for how catastrophic events (including volcanic activities, earthquakes, climatic changes, and the impact of an asteroid/comet) may have affected the conditions on Earth and the diversity of its life forms.	FOSS Planetary Science Investigations Guide 2E Investigation 6: Craters, Part 2: Target Earth, pp. 271-284 Planetary Science FOSS Science Resources Book pp. 36-41, 96-98
8.E.6A.4 Construct and analyze scientific arguments to support claims that different types of fossils provide evidence of (1) the diversity of life that has been present on Earth, (2) relationships between past and existing life forms, and (3) environmental changes that have occurred during Earth's history.	FOSS Earth History Investigations Guide 2E Investigation 4: Fossils and Past Environments, Part 4: Index Fossils, pp. 285-300 Earth History FOSS Science Resources Book pp. 48-60
8.E.6A.5 Construct explanations for why most individual organisms, as well as some entire taxonomic groups of organisms, that lived in the past were never fossilized.	FOSS Earth History Investigations Guide 2E Investigation 4: Fossils and Past Environments, Part 4: Index Fossils, pp. 285-300 Earth History FOSS Science Resources Book pp. 48-60

8.E.6B. Conceptual Understanding: Adaptation by natural selection acting over generations is one important process by which species change in response to changes in environmental conditions. The resources of biological communities can be used within sustainable limits, but if the ecosystem becomes unbalanced in ways that prevent the sustainable use of resources, then ecosystem degradation and species extinction can occur.

Students who demonstrate this understanding can:

PERFORMANCE INDICATOR	DELTA EDUCATION WHERE TAUGHT
8.E.6B.1 Construct explanations for how biological adaptations and genetic variations of traits in a population enhance the probability of survival in a particular environment.	<i>This standard is met at Grade 7 with FOSS Hereditary and Adaptation NG:</i> FOSS Heredity and Adaptation Investigations Guide NG Investigation 3: Evolution, pp. 215 - 290
8.E.6B.2 Obtain and communicate information to support claims that natural and human-made factors can contribute to the extinction of species.	<i>This standard is met at Grade 7 with FOSS Hereditary and Adaptation NG:</i> FOSS Heredity and Adaptation Investigations Guide NG Investigation 3: Evolution, pp. 215 -290