Grade 6
Earth Science

State Standard	FOSS Program
S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved	
a. Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information. (Clarification statement: Students should consider Earth's position in geocentric and heliocentric models and the Big Bang as it describes the formation of the universe.)	**FOSS Next Generation Planetary Science** **TE:** Investigation 6; All Parts **SE:** *The Cosmos in a Nutshell* **DR:** Solar System Origin Card Sort **FOSS Third Edition Motion, Forces, and Models** **SE:** *Scientists and Models*
b. Develop a model to represent the position of the solar system in the Milky Way galaxy and in the known universe.	**FOSS Next Generation Planetary Science** **TE:** Investigation 6; All Parts **SE:** *The Cosmos in a Nutshell* **DR:** Solar System Origin Card Sort
c. Analyze and interpret data to compare the planets in terms of: • size relative to Earth • surface and atmospheric features • relative distance from the sun, and • ability to support life	**FOSS Next Generation Planetary Science** **TE:** Investigation 7; All Parts **SE:** *A Tour of the Solar System* **DR:** Solar System Origin Card Sort
d. Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.	**FOSS Next Generation Planetary Science** **TE:** Investigation 6; All Parts **SE:** *How Earth Got and Held onto Its Moon* **DR:** Origin of the Moon
e. Ask questions to compare and contrast the characteristics, composition, and location of comets, asteroids, and meteoroids.	**FOSS Next Generation Planetary Science** **TE:** Investigation 6; All Parts **SE:** *How Earth Got and Held onto Its Moon, A Tour of the Solar System* **DR:** Origin of the Moon
S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon.	
a. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon	**FOSS Next Generation Planetary Science** **TE:** Investigation 4; All Parts **SE:** *Earth's Moon* **DR:** Lunar Calendar, Day/Night, Phases of the Moon
b. Construct an explanation of the alignment of the sun, Earth, and moon during solar and lunar eclipses.	**FOSS Next Generation Planetary Science** **SE:** *Earth's Moon*
c. Analyze and interpret data to relate the tilt of the Earth to the distribution of sunlight throughout the year and its effect on seasons.	**FOSS Next Generation Planetary Science** **TE:** Investigation 2; All Parts **SE:** *Seasons on Earth* **DR:** Seasons
S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes.	
a. Ask questions to determine where water is located on Earth's surface (oceans, rivers, lakes, groundwater, aquifers, and ice), and communicate the relative proportion of water at each location using a circle/pie graph.	**FOSS Next Generation Weather and Water** **TE:** Investigation 8, Part 1 **SE:** *Earth: The Water Planet*
b. Plan and carry out an investigation to illustrate the role of the sun's energy in atmospheric conditions that lead to the cycling of water. (Clarification statement: The water cycle should include evaporation, condensation, precipitation, transpiration, infiltration, groundwater, and runoff.)	**FOSS Next Generation Weather and Water** **TE**: Investigation 7; All Parts **Delta Science Module Oceans** **TE:** Activity 5 **SE**: *How Do Oceans Affect Weather and Climate?*
c. Ask questions to identify and communicate using graphs and maps the composition, location, and subsurface topography of the world's oceans.	**Delta Science Module Oceans** **TE**: Activity 4 **SE**: *Features of the Ocean Floor*

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d. Analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides in Earth's systems.	**Delta Science Module Oceans** **TE:** Activities 6-9 **SE:** *How Does Ocean Water Move?* **FOSS Next Generation Weather and Water** **TE**: Investigation 8, Parts 2-3 and Extensions **SE:** *Ocean Currents and Gyres; El Nino* **DR:** Tides and Perpetual Ocean
S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.	
a. Analyze and interpret data to compare and contrast the Earth's atmospheric layers (including the ozone layer) and greenhouse gases. (Clarification statement: Earth's atmospheric layers include the troposphere, stratosphere, mesosphere, and thermosphere.)	**FOSS Next Generation Weather and Water** **TE:** Investigation 1, Part 3 Investigation 9, Part 2 ***SE:*** *What's in the Air?* and *A Thin Blue Veil*, *Heating the Atmosphere*
b. Plan and carry out an investigation to demonstrate how energy from the sun transfers heat to air, land and water at different rates. (Clarification statement: Heat transfer should include the processes of conduction, convection and radiation.)	**FOSS Next Generation Weather and Water** **TE:** Investigations 3-5; all parts **SE:** *Density*
c. Develop a model demonstrating the interaction between unequal heating and the rotation of the Earth that causes local and global wind systems.	**FOSS Next Generation Weather and Water** **TE:** Investigation 4; all parts **TE:** Investigation 6; all parts **SE:** *Heating the Atmosphere* and *Wind on Earth*
d. Construct an explanation of the relationship between air pressure, fronts, and air masses and meteorological events such as tornadoes and thunderstorms.	**FOSS Next Generation Weather and Water** **TE:** Investigation 1; all parts Investigation 6; all parts Investigation 10; Part 1 **SE:** *Severe Weather, Heating the Atmosphere and Wind on Earth, Climates: Past and Future* **DR:** Hurricanes and Tornadoes, Weather Maps
e. Analyze and interpret weather data to explain the effects of moisture evaporating from the ocean on weather patterns and weather events such as hurricanes.	**FOSS Next Generation Weather and Water** **TE:** Investigation 9, all parts **SE:** *Climates: Past, Present and Future*
S6E5. Obtain, evaluate and communicate information to show how Earth's surface is formed.	
a. Ask questions to compare and contrast the Earth's crust, mantle, inner and outer core, including temperature, density, thickness, and composition.	**FOSS Next Generation Earth History** **TE:** Investigation 5; all parts **DR:** *Earth's Interior, slide show*
b. Plan and carry out an investigation of the characteristics of minerals and how minerals contribute to rock composition.	**FOSS Next Generation Earth History** **TE:** Investigation 5; all parts **SE:** *Minerals, Crystals, and Rocks*
c. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle.	**FOSS Next Generation Earth History** **TE:** Investigation 3; all parts Investigation 5; all parts Investigation 7; all parts **SE:** *Where in the World Is Calcium Carbonate?, Minerals, Crystals, and Rocks, Rock Transformations* and *How One Rock Became Another Rock* and *Typical Earth Rocks* **DR***:* Sandstone Formation, Shale Formation and Limestone Formations, Sedimentary Rocks Tour, Extrusive Rock Formation and Intrusive Rock Formation, Rock Database, How Metamorphic Rocks Form
d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. (*Clarification statement: Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.)*	**FOSS Next Generation Earth History** **TE:** Investigation 2; all parts **I**nvestigation 3; all parts **SE:** *Grand Canyon Flood; Weathering and Erosion; Modern Sedimentary Environments, Where in the World Is Calcium Carbonate?* **DR:** Stream Tables, Debris Flow, Freezing Glass, Frost Wedging and Rock Falls, Sandstone Formation, Shale

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	Formation and Limestone Formation, Sedimentary Rocks Tour
e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth.	**FOSS Next Generation Earth History** **TE:** Investigation 2; all parts Investigation 3; all parts **SE:** *Grand Canyon Flood; Weathering and Erosion; Modern Sedimentary Environments, Where in the World Is Calcium Carbonate?* **DR:** Stream Tables, Debris Flow Freezing Glass, Frost Wedging, and Rock Falls, Sandstone Formation, Shale Formation, and Limestone Formation, Sedimentary Rocks Tour
f. Construct an explanation of how the movement of lithospheric plates (convergent boundary, divergent boundary, transform boundary), called plate tectonics, is due to convection currents below the lithosphere, and can cause major geologic events such as earthquakes and volcanic eruptions.	**FOSS Next Generation Earth History** **TE:** Investigation 6; parts 2 and 3 Investigation 7; part 1 **SE:** *The History of Plate Tectonics, Earth's Dynamic Systems* **DR:** Plate Tectonics: The Scientist Behind the Theory, Earthquakes Around the World, Plate Boundaries Map, Fault Types; Convergent, Divergent, Transform and Folding, Mountain Types
g. Construct an argument using maps and data collected to support a claim of how fossils show evidence of the changing surface and climate of the Earth.	**FOSS Next Generation Earth History** **TE:** Investigation 4; all parts Investigation 6; all parts **SE:** *Rocks, Fossils, and Time* and *Floating on a Prehistoric Sea, The History of Plate Tectonics*
h. Plan and carry out an investigation to provide evidence that soil is composed of layers of weathered rocks and decomposed organic material.	**FOSS Next Generation Earth History** **TE:** Investigation 2, Part 3 **SE:** *Soil Stories*
S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.	
a. Ask questions to determine the differences between renewable/sustainable energy resources (i.e. hydro, solar, wind, geothermal, tidal, and biomass) and nonrenewable energy resources (i.e. nuclear: uranium, and fossil fuels: oil coal, and natural gas), and how they are used in our everyday lives.	**FOSS Next Generation Earth History** **TE:** Investigation 8; all parts **SE:** *Geoscenarios* **DR:** Geoscenarios **FOSS Next Generation Planetary Science** **TE:** Investigation 7; all parts
b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.	**FOSS Next Generation Weather and Water** **TE:** Investigation 9; parts 2 and 3 Investigation 8; all parts **SE**: *Climates: Past, Present, and Future, Geoscenarios* **DR:** Climate Change Basics, Geoscenarios
c. Construct an argument evaluating contributions to a rise in global temperatures over the past century. (*Clarification statement*: Tables, graphs, and maps of global and regional temperatures, and atmospheric levels of greenhouse gases such as carbon dioxide and methane, should be used as sources of evidence.)	**FOSS Next Generation Weather and Water** **TE:** Investigation 9; all parts **SE**: *Climates: Past, Present, and Future (see Images and Data section for tables and graphs of climate data)* **DR:** Earth's Climate Over Time, Climate Blog, Greenhouse Simulator, Human-Caused Sources of Carbon Dioxide, Carbon Cycle; Climate Change Basics

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Grade 7
Life Science

State Standard	FOSS Program
S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.	
a. Develop and defend a model that categorizes organisms based on common characteristics.	**FOSS Next Generation Diversity of Life** **TE:** Investigations 1, 3-5, 9; all parts **SE:** *Characteristics of Life on Earth, The Amazing Paramecium, Bacteria Around Us, The Water Conservation Problem, Biodiversity at Home and Abroad*
b. Evaluate historical models of how organisms were classified based on physical characteristics and how that led to the six-kingdom system (currently archaea, bacteria, protists, fungi, plants, and animals). (Clarification statement: This includes common examples and characteristics such as, but not limited to, prokaryotic, eukaryotic, unicellular, multicellular, asexual reproduction, sexual reproduction, autotroph, heterotroph, and unique cell structures. Modern classification will be addressed in high school.)	**FOSS Next Generation Diversity of Life** **TE:** Investigations 3-4; all parts **SE:** *The Amazing Paramecium, Bacteria Around Us*
S7L2. Obtain, evaluate, and communicate information to construct scientific explanations to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.	
a. Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste. (*Clarification statement:* The intent is for students to demonstrate how the component structures of the cell interact and work together to allow the cell as a whole to carry out various processes. Additional structures, beyond those listed, will be addressed in high school Biology.)	**FOSS Next Generation Diversity of Life** **TE:** Investigation 3; all parts **SE:** *The Amazing Paramecium* **DR:** Levels of Complexity
b. Develop and use a conceptual model of how cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.	**FOSS Next Generation Human Systems Interactions** **TE:** Investigation 1; all parts **DR:** Levels of Complexity, Structural Levels Cards **FOSS Next Generation Diversity of Life** **TE:** Investigation 3; all parts **SE**: *The Amazing Paramecium*
c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes. (*Clarification statement:* The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)	**FOSS Next Generation Human Systems Interactions** **TE:** Investigations 1-3; All Parts **DR:** Structural Levels, Digestive and Excretory Systems, Circulatory and Respiratory Systems, Human Cardiovascular Systems, Senses Menus, Brain Synapse Function, Brain Neuron Growth, Reaction Timer
S7L3. Obtain, evaluate, and communicate information to explain how organisms reproduce either sexually or asexually and transfer genetic information to determine the traits of their offspring.	
a. Construct an explanation supported with scientific evidence of the role of genes and chromosomes in the process of inheriting a specific trait.	**FOSS Next Generation Heredity and Adaptation** **TE:** Investigation 2, all parts **SE:** *Earth: The Water Planet* **DR:** *Heredity Slide Show*
b. Develop and use a model to describe how asexual reproduction can result in offspring with identical genetic information while sexual reproduction results in genetic variation. (*Clarification statement:* Models could include, but are not limited to, the use of monohybrid Punnett squares to demonstrate the heritability of genes and the resulting genetic variation, identification of heterozygous and homozygous, and	**FOSS Next Generation Diversity of Life** **TE**: Investigations 6-7; all parts **SE:** *The Amazing Paramecium* **DR:** Levels of Complexity **FOSS Next Generation Heredity and Adaptation** **TE:** Investigation 2; all parts **SE:** Tree Thinking

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comparison of genotype vs. phenotype.)	**DR:** A Model for Predicting Genetic Variation, Larkey Impossible Traits, Lareky Punnett Square
c. Ask questions to gather and synthesize information about the ways humans influence the inheritance of desired traits in organisms through selective breeding. (*Clarification statement:* The element specifically refers to artificial selection and the ways in which it is fundamentally different than natural selection.)	**FOSS Next Generation Heredity and Adaptation** **TE:** Investigation 3; all parts **SE:** *Adaptation* **DR:** Genetic Technology Resources
S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.	
a. Construct an explanation to describe the patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of the ecosystem. (*Clarification statement:* The interactions include, but are not limited to, predator- prey relationships, competition, mutualism, parasitism, and commensalism.)	**FOSS Next Generation Populations and Ecosystems** **TE:** Investigations 2-4; all parts **SE**: *Life in a Community, An Introduction to Mono Lake, Biosphere 2: An Experiment in Isolation* **DR:** Ecoscenarios, The Mono Lake Story, The Mono Lake Food Web
b. Develop a model to describe the cycling of matter and the flow of energy among biotic and abiotic components of an ecosystem. (*Clarification statement:* Emphasis is on tracing movement of matter and flow of energy, not on the biochemical mechanisms of photosynthesis and cellular respiration.)	**FOSS Next Generation Populations and Ecosystems** **TE:** Investigations 3, 5-6; all parts **SE:** *An Intro to Mono Lake, Energy and Life, Trophic Levels* **DR:** The Mono Lake Food Web
c. Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems.	**FOSS Next Generation Populations and Ecosystems** **TE:** Investigations 7-9; all parts **SE:** *Limiting Factors, Biodiversity, Trophic Levels* **DR:** Milkweed Bugs, Hawaii: Strangers in Paradise and The Mono Lake Story, Ecoscenario Research Center
d. Ask questions to gather and synthesize information from multiple sources to differentiate between Earth's major terrestrial biomes (i.e., tropical rain forest, savanna, temperate forest, desert, grassland, taiga, and tundra) and aquatic ecosystems (i.e., freshwater, estuaries, and marine). (Clarification statement: Emphasis is on the factors that influence patterns across biomes such as the climate, availability of food and water, and location.	**FOSS Next Generation Populations and Ecosystems** **TE:** Investigations 2-3, 9; all parts **SE:** *Life in a Community, An Intro to Mono Lake, Trophic Levels* **DR:** Ecoscenarios, Ecoscenario Research Center
S7L5. Obtain, evaluate, and communicate information from multiple sources to explain the theory of evolution of living organisms through inherited characteristics.	
a. Use mathematical representations to evaluate explanations of how natural selection leads to changes in specific traits of populations over successive generations. (*Clarification statement:* Referencing data should be obtained from multiple sources including, but not limited to, existing research and simulations. Students should be able to calculate means, represent this data in a table or graph, and reference it when explaining the principles of natural selection.).	**FOSS Next Generation Earth History** **TE:** Investigation 5; all parts **DR:** Earth's Interior, slide show
b. Construct an explanation based on evidence that describes how genetic variation and environmental factors influence the probability of survival and reproduction of a species.	**FOSS Next Generation Earth History** **TE:** Investigation 5; all parts **SE:** *Minerals, Crystals, and Rocks*
c. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, and extinction of organisms and their relationships to modern organisms. (Clarification statement: Evidence of evolution found in comparisons of current/modern organisms such as homologous structures, DNA, and fetal development will be addressed in high school.)	**FOSS Next Generation Earth History** **TE:** Investigations 3, 5, 7; all parts **SE:** *Where in the World Is Calcium Carbonate?, Minerals, Crystals, and Rocks, Rock Transformations* and *How One Rock Became Another Rock* and *Typical Earth Rocks* **DR***:* Sandstone Formation, Shale Formation and Limestone Formations, Sedimentary Rocks Tour**,** Extrusive Rock Formation and Intrusive Rock Formation, Rock Database**,** How Metamorphic Rocks Form

Grade 8
Physical Science

State Standard	FOSS Program
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.	
a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures. (Clarification statement: Include heterogeneous and homogeneous mixtures. Types of bonds and compounds will be addressed in high school physical science.)	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 1-2; all parts **SE:** *Elements; Substances on Earth; Substances in the Universe*
b. Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed.	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 3-6, 8; all parts **SE:** *Particles; Three Phases of Matter, Particles in Motion; Expansion and Contraction, Engineering a Better Design,* Energy on the Move, *Rock Solid; Heat of Fusion* **DR:** Particles in Solids, Liquids, and Gases, Energy Flow; Mixing Hot and Cold Water; Thermometer
c. Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical properties of matter (i.e., density, melting point, boiling point).	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 7-10; all parts **SE:** *How Things Dissolve; Concentration, Rock Solid; Heat of Fusion, How Do Atoms Rearrange; Fireworks; Antoine-Laurent Lavoisier*
d. Construct an argument to support the claim that when a change occurs it is either chemical or physical. (Clarification statement: Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.)	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 7-10; all parts **SE:** *How Things Dissolve; Concentration, Rock Solid; Heat of Fusion, How Do Atoms Rearrange; Fireworks; Antoine-Laurent Lavoisier*
e. Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (including protons, neutrons, and electrons) and simple molecules.	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 1-2, 9; all parts **SE:** *Elements, How Do Atoms Rearrange; Fireworks; Antoine-Laurent Lavoisier* **DR:** Periodic Table **Delta Science Reader Matter and Change** **SE:** *What Makes Up Matter?*
f. Construct an explanation based on evidence to describe conservation of matter and mass in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models with balanced chemical equations.)	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 9-10; all parts **SE:** *How Do Atoms Rearrange; Fireworks; Antoine-Laurent Lavoisier*
S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.	
a. Analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed and potential energy to mass and height of an object.	**FOSS Next Generation Gravity and Kinetic Energy** **TE:** Investigation 3; parts 1 and 2
b. Plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller coasters, pendulums, rubber bands).	**FOSS Next Generation Gravity and Kinetic Energy** **TE:** Investigation 3; parts 1 and 2
c. Construct an explanation about energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)].	**FOSS Next Generation Electromagnetic Force** **TE:** Investigation 3; parts 2 and 3 Investigation 4; all parts **SE**: *Electromagnetism; Electromagnetism Engineering, Rebirth of Electric Cars; Where We Get Energy*
d. Plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection).	**FOSS Next Generation Chemical Interactions** **TE:** Investigations 4-6; all parts

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S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.	
a.Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (Clarification statement: Students should be able to analyze motion graphs, but students should not be expected to calculate velocity or acceleration.)	**FOSS Next Generation Gravity and Kinetic Energy** **TE:** Investigation 1, all parts **SE:** *Faster and Faster; Gravity: It's the Law; A Weighty Matter*
b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.	**FOSS Next Generation Electromagnetic Force** **TE**: Investigation 1; Part 3 **SE:** *The Discovery of Friction; Net Force* **FOSS Next Generation Gravity and Kinetic Energy** **TE:** Investigation 2-3; all parts **SE:** *Newton's Laws*
c. Construct an argument from evidence to support the claim that heavier objects require a greater force to accelerate (inertia).	**FOSS Next Generation Electromagnetic Force** **TE**: Investigation 1; Part 3 **SE**: *The Discovery of Friction* **FOSS Next Generation Gravity and Kinetic Energy** **TE:** Investigation 3; Parts 1 and 2 **SE:** *The Discovery of Friction;*
S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.	
a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves. (Clarification statement: Include transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions.)	**FOSS Next Generation Waves** **TE:** Investigation 2; all parts **SE**: *Transverse and Compression Waves*
b. Construct an explanation using data to illustrate the relationship between the electromagnet spectrum and energy.	**FOSS Next Generation Waves** **TE:** Investigation 3; all parts **SE:** *Electromagnetic Spectra; Wave-Energy Key Points*
c. Obtain, evaluate, and communicate information to explain practical applications of the electromagnetic spectrum (e.g., communication, medical, military).	**FOSS Next Generation Waves** **TE:** Investigation 4; all parts **SE:** *Lasers*
d. Develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted, or transmitted through various materials. (Clarification statement: Include echo and how color is seen but not interference and scattering.)	**FOSS Next Generation Waves** **TE:** Investigation 1; all parts Investigation 2; all parts Investigation 3; all parts **SE:** *Transverse and Compression Waves; Sound Waves; Reflecting on Life; Throw a Little Light on Sight!;Seismic Waves* **DR**: Refraction
e. Analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed).	**FOSS Next Generation Waves** **TE:** Investigation 3; all parts
f. Develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, and wavelength) and energy.	**FOSS Next Generation Waves** **TE:** Investigation 1; Part 2 Investigation 2; Part 3 Investigation 3; all parts **SE:** *Ocean Waves, Electromagnetic Spectra; Wave-Energy Key Points; Electromagnetic* **DR:** Oscilloscope
g. Develop and use models to demonstrate the effects and functions of lenses.	**FOSS Next Generation Waves** **TE:** Investigation 3; Part 4

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S8P5. Obtain, evaluate, and communicate information about the phenomena of gravity, electricity, and magnetism as major forces acting in nature.	
a. Construct an argument using evidence to support the claim that fields (i.e., magnetic fields, gravitational fields, and electric fields) exist between objects exerting forces on each other even when the objects are not in contact.	**FOSS Next Generation Electromagnetic Force** **TE:** Investigations 1-2; all parts Investigation 3; Parts 2 and 3 **SE:** *The Force Is with You, The Discovery of Friction, Magnetic Force, Electromagnetism* **FOSS Next Generation Gravity and Kinetic Energy** **TE:** Investigations 1-2; all parts **SE:** *Gravity: It's the Law, Gravity in Space*
b. Plan and carry out investigations to demonstrate the distribution of charge in conductors and insulators. (Clarification statement: Include conduction, induction, and friction.)	**FOSS Next Generation Electromagnetic Force** **TE:** Investigation 3; all parts **SE:** *Circuitry and Lightbulbs; What Is Electricity?; Electromagnetic Engineering*
c. Plan and carry out investigations to identify factors (e.g., distance between objects, magnetic force produced by an electromagnet with varying number of wire turns, varying number or size of dry cells, and varying size of iron core) that affect the strength of electric and magnetic forces. (*Clarification statement:* The investigations included, but are not limited to, generators or motors.)	**FOSS Next Generation Electromagnetic Force** **TE:** Investigation 3; Parts 2 and 3 **SE:** *Electromagnetism; Electromagnetic Engineering*