

Grade 6
 Life Science

State Standard	FOSS Program
6.LS2 Ecosystems: Interaction, Energy and Dynamics	
1) Evaluate and communicate the impact of environmental variables on population size.	FOSS Next Generation Populations and Ecosystems TE: Investigation 1; Parts 1-3 Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 Investigation 7; Parts 1-3 Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Observations and Inferences, Milkweed Bugs, An Introduction to Mono Lake, Biosphere2: An Experiment in Isolation, Limiting Factors, Mono Lake Throughout the Year, Biodiversity, Invasive Species, Mono Lake in the Spotlight, Ecoscenario Introductions</i> DR: Monolake Foodweb, Ecoscenarios, Organism Database, The Mono Lake Story, Milkweed Bugs Unlimited, Milkweed Bugs Limited, Hawaii: Strangers in Paradise, Ecoscenario Research Center
2) Determine the impact of competitive, symbiotic, and predatory interactions in an ecosystem.	FOSS Next Generation Populations and Ecosystems TE: Investigation 3; Parts 1-3 Investigation 8; Parts 1-3 SE: <i>An Introduction to Mono Lake, Biodiversity, Invasive Species, Mono Lake in the Spotlight</i> DR: Mono Lake Food Web, Ecoscenarios, Organism Database, The Mono Lake Story, Hawaii: Strangers in Paradise
3) Draw conclusions about the transfer of energy through a food web and energy pyramid in an ecosystem.	FOSS Next Generation Populations and Ecosystems TE: Investigation 5; Parts 1-4 Investigation 6; Parts 1-4 SE: <i>Where Does Food Come From?, Energy and life, What Does Water Do?, Wangari Maathai: Being a Hummingbird, Rachel Carson and the Silent Spring, Trophic Levels, Decomposers</i> DR: Ecoscenarios, Biomes
4) Using evidence from climate data, draw conclusions about the patterns of abiotic and biotic factors in different biomes, specifically the tundra, taiga, deciduous forest, desert, grasslands, rainforest, marine, and freshwater ecosystems.	FOSS Next Generation Populations and Ecosystems TE: Investigation 2; Parts 1-3 SE: <i>Life in a Community, Ecoscenario Introductions, Defining a Biome</i> DR: Ecoscenarios, Biomes, Among the Wild Chimpanzees
5) Analyze existing evidence about the effect of a specific invasive species on native populations in Tennessee and design a solution to mitigate its impact.	FOSS Next Generation Populations and Ecosystems TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Biodiversity, Invasive Species, Mono Lake in the Spotlight, Ecoscenario Introductions</i> DR: Hawaii: Strangers in Paradise, Ecoscenario Research Center
6) Research the ways in which an ecosystem has changed over time in response to changes in physical conditions, population balances, human interactions, and natural catastrophes.	FOSS Next Generation Populations and Ecosystems TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Biodiversity, Invasive Species, Mono Lake in the Spotlight, Ecoscenario Introductions</i> DR: Hawaii: Strangers in Paradise, Ecoscenario Research Center
7) Compare and contrast auditory and visual methods of communication among organisms in relation to survival strategies of a population.	

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State Standard	FOSS Program
6.LS4: Biological Change: Unity and Diversity	FOSS Next Generation <i>Populations and Ecosystems</i>
1) Explain how changes in biodiversity would impact ecosystem stability and natural resources. 2) Design a possible solution for maintaining biodiversity of ecosystems while still providing necessary human resources without disrupting environmental equilibrium.	TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Biodiversity, Invasive Species, Mono Lake in the Spotlight, Ecoscenario Introductions</i> DR: Hawaii: Strangers in Paradise, Ecoscenario Research Center

Earth and Space Science

State Standard	FOSS Program
6.ESS2 Earth's Systems	FOSS Next Generation <i>Weather and Water</i>
1) Gather evidence to justify that oceanic convection currents are caused by the sun's transfer of heat energy and differences in salt concentration leading to global water movement.	TE: Investigation 3; Parts 1-3 Investigation 8; Parts 1-3 SE: <i>Density, Density with Dey, Convection, Earth the Water Planet, Ocean Currents and Gyres, El Nino,</i> DR: Particles in Solids, Liquids and Gases; Energy, Transfer: Conduction, Radiation, Convection, Fluid Convection, Convection Chamber in Action, Water Cycle, Perpetual Ocean
2) Diagram convection patterns that flow due to uneven heating of the earth.	FOSS Next Generation <i>Weather and Water</i> TE: Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 Investigation 6; Parts 1-3 SE: <i>Density, Density with Dey, Convection, Thermometer: A Device to Measure Temperature, Heating the Atmosphere, Wind on Earth</i> DR: Particles in Solids, Liquids and Gases; Energy Transfer: Conduction, Radiation, Convection, Fluid Convection, Convection Chamber in Action, Longitude and Latitude Simulations, Local Wind, NOAA Ridge, Red Spot
3) Construct an explanation for how atmospheric flow, geographic features, and ocean currents affect the climate of a region through heat transfer.	FOSS Next Generation <i>Weather and Water</i> TE: Investigation 2; Parts 1-2 Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 Investigation 5; Parts 1-3 Investigation 6; Parts 1-3 Investigation 8; Parts 1-3 SE: <i>What is Air Pressure? Density, Density with Dey, Convection, Thermometer: A Device to Measure Temperature, Earth Material Temperature Chart, Earth Material Temperature Graph, Earth-Material Temperature Questions Heating the Atmosphere, Wind on Earth, Earth the Water Planet, Ocean Currents and Gyres, El Nino</i> DR: Gas in a Syringe, Weather Balloon Simulation, Elevator to Space, Barometer in a Bottle, Particles in Solids, Liquids and Gases; Energy Transfer: Conduction, Radiation, Convection, Energy Transfer by Collision, Conduction through Metals, Fluid Convection, Convection Chamber in Action, Longitude and Latitude Simulations, Local Wind, NOAA Ridge, Red Spot, Water Cycle, Perpetual Ocean

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<p>4) Apply scientific principles to design a method to analyze and interpret the impact of humans and other organisms on the hydrologic cycle.</p>	<p>FOSS Next Generation Weather and Water TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Earth the Water Planet, Ocean Currents and Gyres, El Nino, Climates: Past, Present and Future</i> DR: Water Cycle, Perpetual Ocean, Climate Blog, Greenhouse-Gas Simulator, Human-Caused Sources of Carbon Dioxide, CO2 in the Ice Core Record, Carbon Cycle, Climate Change Basics, Earth's Climate Over Time</p>
<p>5) Analyze and interpret data from weather conditions, weather maps, satellites, and radar to predict probable local weather patterns and conditions.</p>	<p>FOSS Next Generation Weather and Water TE: Investigation 1; Parts 1-3 Investigation 7; Parts 1-3 Investigation 10; Parts 1-2 SE: <i>Severe Weather, What's in the Air?, A Thin Blue Veil, Weather Balloons and the Radiosonde, Animal Rains</i> DR: Class Weather Data Grapher, Climate Blog, Gas in a Syringe, Elevator to Space, Cloud in a Bottle, Weather Maps</p>
<p>6) Explain how relationships between the movement and interactions of air masses, high and low pressure systems, and frontal boundaries result in weather conditions and severe catastrophes.</p>	<p>FOSS Next Generation Weather and Water TE: Investigation 1; Parts 1-3 Investigation 2; Parts 1-2 Investigation 10; Parts 1-2 SE: <i>Severe Weather, What's in the Air?, A Thin Blue Veil, What is Air Pressure?</i> DR: Class Weather Data Grapher, Climate Blog, Gas in a Syringe, Elevator to Space, Barometer in a Bottle, Cloud in a Bottle, Weather Maps</p>
State Standard	FOSS Program
6.ESS3 Human Activity	
<p>1) Differentiate between renewable and nonrenewable resources by asking questions about their availability and sustainability.</p> <p>2) Investigate and compare existing and developing technologies that utilize renewable and alternative energy resources.</p> <p>3) Assess the impacts of human activities on the biosphere including conservation, habitat management, species endangerment, and extinction.</p>	<p>FOSS Next Generation Weather and Water TE: Investigation 9; Parts 1-3 SE: <i>Greenhouse Gases in the Atmosphere, Climates: Past, Present and Future</i> DR: Co2 in the Ice Core Record, Earth's Climate Over Time, Greenhouse Gas Simulator, Human-Caused Sources of Carbon Dioxide, Climate Blog, Carbon Cycle, Water Cycle, Climate Change Basics</p> <p>FOSS Next Generation Populations and Ecosystems TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Biodiversity, Invasive Species, Mono Lake in the Spotlight, Ecoscenario Introductions</i> DR: Hawaii: Strangers in Paradise, Ecoscenario Research Center</p>

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 Physical Science

State Standard	FOSS Program
<p>6.PS3: Energy</p> <p>1) Analyze the properties and compare sources of kinetic, elastic potential, gravitational potential, electric potential, chemical, and thermal energy.</p>	<p>FOSS Next Generation Gravity and Kinetic Energy TE: Investigation 3; Parts 1-3 Investigation 4; Parts 1-2 SE: <i>Potential and Kinetic Energy, Avoiding Collisions, Newton's Laws, Engineering a Safer Car, Collisions and Concussions</i> DR: <i>Understanding Car Crashes</i></p> <p>FOSS Next Generation Weather and Water TE: Investigation 4; Part 3 SE: Earth Material Temperature Chart, Earth Material Temperature Graph, Earth-Material Temperature Questions, DR: Thermometer: A Device to Measure Temperature, Energy Transfer: Conduction, Radiation, Convection</p>
<p>2) Construct a scientific explanation of the transformations between potential and kinetic energy</p>	<p>FOSS Next Generation Gravity and Kinetic Energy TE: Investigation 3; Parts 1-3 SE: <i>Potential and Kinetic Energy, Avoiding Collisions, Newton's Laws,</i></p>
<p>3) Analyze and interpret data to show the relationship between kinetic energy and the mass of an object in motion and its speed.</p>	<p>FOSS Next Generation Gravity and Kinetic Energy TE: Investigation 1; Parts 1-3 Investigation 2; Parts 1-2 SE: <i>How Fast Do Things Go?, Faster and Faster, Gravity: It's the Law, A Weighty Matter, Gravity in Space</i> DR: Movie tracker, Movie Tracker Data, Falling Ball Analysis slide show, Falling Ball, Heavy and Light Balls, Hammer and Feather in Space</p>
<p>4) Conduct an investigation to demonstrate the way that heat (thermal energy) moves among objects through radiation, conduction, or convection.</p>	<p>FOSS Next Generation Weather and Water TE: Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 Investigation 5; Parts 1-3 Investigation 6; Parts 1-3 SE: <i>Density, Density with Dey, Convection, Thermometer: A Device to Measure Temperature, Earth Material Temperature Chart, Earth Material Temperature Graph, Earth-Material Temperature Questions Heating the Atmosphere, Wind on Earth</i> DR: Particles in Solids, Liquids and Gases; Energy Transfer: Conduction, Radiation, Convection, Energy Transfer by Collision, Conduction through Metals, Fluid Convection, Convection Chamber in Action, Longitude and Latitude Simulations, Local Wind, NOAA Ridge, Red Spot</p>

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Grade 6
 Engineering Design ETS

State Standard	FOSS Program
<p>6.ETS1: Engineering Design</p> <p>1) Evaluate design constraints on solutions for maintaining ecosystems and biodiversity.</p> <p>2) Design and test different solutions that impact energy transfer.</p>	<p>FOSS Next Generation Variables and Design</p> <p>TE: Investigation 1; Parts 1-3 Investigation 2; Parts 1-2 Investigation 3; Parts 1-2</p> <p>SE: <i>What do Scientists and Engineers Do?, What's a Trolley?, Keep Your Variables under Control, Efficiency, Lead Detector, Solar Tents, The Problem of Traffic, Digital Manufacturing, Spotlighting Engineers, Robotics</i></p> <p>DR: Blasto, Virtual Aquarium, What's an Engineer?, Engineering Problems, Zip Line, Bridge Design, Engineering Design Cycle, Enable Tech, Maker Space, Jumping Robot, Genetic Engineering, 3D Printing Explored, 3D-Printed Home</p> <p>FOSS Next Generation Gravity and Kinetic Energy</p> <p>TE: Investigation 4; Parts 1-2</p> <p>SE: <i>Engineering a Safer Car, Collisions and Concussions</i></p> <p>DR: Understanding Car Crashes</p> <p>FOSS Next Generation Populations and Ecosystems</p> <p>TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3</p> <p>SE: <i>Biodiversity, Invasive Species, Mono Lake in the Spotlight, Ecoscenario Introductions</i></p> <p>DR: Hawaii: Strangers in Paradise, Ecoscenario Research Center</p>

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 Life Science

State Standard	FOSS Program
7.LS1: From Molecules to Organisms: Structures and Processes	
1) Develop and construct models that identify and explain the structure and function of major cell organelles as they contribute to the life activities of the cell and organism.	FOSS Next Generation Diversity of Life TE: Investigation 3; Parts 1-4 SE: <i>The Amazing Paramecium, Microorganism Guide, Cells, How Big are Cells?</i> DR: Virtual Microscope, Levels of Complexity: Plant Cell, Protist Cell, Animal Cell; Database: Elodea Cells, Elodea Cytoplasmic Streaming, Paramecium Collection, Microorganism Collection, Human Cheek Cell, Lab Techniques: Preparing a Wet Mount, Preparing a Paramecia Wet Mount Slide, Using Cotton to Slow Paramecia, Making a Human Cheek Tissue Slide
2) Conduct an investigation to demonstrate how the cell membrane maintains homeostasis through the process of passive transport.	FOSS Next Generation Diversity of Life TE: Investigation 3; Parts 1-2 SE: <i>The Amazing Paramecium, Cells</i> DR: Virtual Microscope, Database: Elodea Cells, Elodea Cytoplasmic Streaming, Paramecium Collection, Levels of Complexity: Plant Cell, Protist Cell; Lab Techniques: Preparing a Wet Mount, Preparing a Paramecia Wet Mount Slide
3) Evaluate evidence that cells have structural similarities and differences in organisms across kingdoms.	FOSS Next Generation Diversity of Life TE: Investigation 3; Parts 1-4 Investigation 4; Parts 1-4 Investigation 9; Parts 1-2 SE: <i>The Amazing Paramecium, Microorganism Guide, Cells, How Big are Cells?, Levels of Complexity: Research Pages, Bacteria Around Us, Archaea Family Album, The Three Domains of Life, Biodiversity at Home and Abroad, Viruses: Living or Nonliving?</i> DR: Virtual Microscope, Database: Elodea Cells, Elodea Cytoplasmic Streaming, Paramecium Collection, Levels of Complexity: Plant Cell, Protist Cell; Lab Techniques: Preparing a Wet Mount, Preparing a Paramecia Wet Mount Slide, Levels of Complexity: Card Sort, The Scale of the Universe, Lab Techniques: Preparing an Agar Plate, Inoculating an Agar Plate; Database: Yogurt Bacteria, Levels of Complexity: Bacterial Cell, A Million Dollars, Exponential Growth, Levels of Complexity: Fungal Cell, Funky Fungi Freak Show, Itsy Bitsy Thingy Locator, Fungus Slide Show, Levels of Complexity: Archaean Cell, Classification History slide show, Flu Attack, Viruses on the Attack
4) Diagram the hierarchical organization of multicellular organisms from cells to organism.	FOSS Next Generation Diversity of Life TE: Investigation 4; Parts 1-4 SE: <i>Levels of Complexity: Research Pages, Bacteria Around Us, Archaea Family Album, The Three Domains of Life</i> DR: Levels of Complexity: Card Sort, The Scale of the Universe, Lab Techniques: Preparing an Agar Plate, Inoculating an Agar Plate; Database: Yogurt Bacteria, Levels of Complexity: Bacterial Cell, A Million Dollars, Exponential Growth, Levels of Complexity: Fungal Cell, Funky Fungi Freak Show, Itsy Bitsy Thingy Locator, Fungus Slide Show,

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	Levels of Complexity: Archaean Cell, Classification History slide show
5) Explain that the body is a system comprised of subsystems that maintain equilibrium and support life through digestion, respiration, excretion, circulation, sensation (nervous and integumentary), and locomotion (musculoskeletal).	FOSS Next Generation Human Systems Interactions TE: Investigation 1; Parts 1-2 Investigation 2; Parts 1-2 Investigation 3; Parts 1-4 SE: <i>Human Organ Systems, Disease Information, Aerobic Cellular Respiration, Sensory Receptors, Touch, Hearing, Sensory Activity Brain map, Brain Messages, Neurotransmission, Smell and taste, Sight, Memory and Your Brain</i> DR: Levels of Complexity, Human Body Structural Levels, Doctor Interviews 1 and 2, Human Cardiovascular System, Digestive and Excretory Systems, Circulatory and Respiratory Systems, Touch Menu, Brain: Synapse Function, Brain: Neuron Growth, Smell Menu, Vision Menu, Reaction Timer, How Memory Works
6) Develop an argument based on empirical evidence and scientific reasoning to explain how behavioral and structural adaptations in animals and plants affect the probability of survival and reproductive success.	FOSS Next Generation Diversity of Life TE: Investigation 6; Parts 1-4 Investigation 7; Parts 1-2 Investigation 8; Part 1 SE: <i>Breeding Salt Tolerant Wheat, The Making of a New Plant, Seeds on the Move, Mendel and Punnett Squares, Those Amazing Insects, Insect Structures and Functions</i> DR: Database: Flower Collection, Seed Collection, Pollinator Collection, Nonflowering Plants, Lab Technique: Preparing the Flower Dissection Mount, Pollinators Game, Genes and Heredity, Database: Insect Collection
7) Evaluate and communicate evidence that compares and contrasts the advantages and disadvantages of sexual and asexual reproduction.	FOSS Next Generation Diversity of Life TE: Investigation 3; Part 2 Investigation 6; Parts 1-4 Investigation 7; Parts 1-2 SE: <i>The Amazing Paramecium, Breeding Salt Tolerant Wheat, The Making of a New Plant, Seeds on the Move, Mendel and Punnett Squares,</i> DR: Database: Paramecium Collection, Levels of Complexity: Protist Cell, Lab Techniques: Preparing a Paramecia Wet-Mount Slide, Using Cotton to Slow Paramecia, Database: Flower Collection, Seed Collection, Pollinator Collection, Nonflowering Plants, Lab Technique: Preparing the Flower Dissection Mount, Pollinators Game, Genes and Heredity
8) Construct an explanation demonstrating that the function of mitosis for multicellular organisms is for growth and repair through the production of genetically identical daughter cells.	
9) Construct a scientific explanation based on compiled evidence for the processes of photosynthesis, cellular respiration, and anaerobic respiration in the cycling of matter and flow of energy into and out of organisms.	FOSS Next Generation Diversity of Life TE: Investigation 5; Parts 1-3 SE: <i>The Water-Conservation Problem, Water, Light and Energy</i> DR: Database: Stem Collection, Stomata Collection, Levels of Complexity: Plant Vascular System
State Standard	FOSS Program
7.LS2: Ecosystems: Interactions, Energy, and Dynamics	
1) Develop a model to depict the cycling of matter, including carbon and oxygen, including the flow of energy among biotic	FOSS Next Generation Diversity of Life TE: Investigation 5; Parts 1-3 Investigation 6; Parts 1-4

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<p>and abiotic parts of an ecosystem.</p>	<p>Investigation 8; Parts 1-2 Investigation 9; Part 1 SE: <i>The Water-Conservation Problem, Water, Light and Energy, Breeding Salt Tolerant Wheat, The Making of a New Plant, Seeds on the Move, Biodiversity at Home and Abroad</i> DR: Database: Stem Collection, Stomata Collection, Flower Collection, Seed Collection, Pollinator Collection, Insect Collection, Levels of Complexity: Plant Vascular System, Pollinators Game, Those Amazing Insects, Insect Structures and Functions</p> <p>NOTE: Standard also Addressed in Grade 6: FOSS Next Generation Populations and Ecosystems TE: Investigation 3 Investigation 5 Investigation 6</p>
State Standard	FOSS Program
7.LS3: Heredity: Inheritance and Variation of Traits	
<p>1) Hypothesize that the impact of structural changes to genes (i.e., mutations) located on chromosomes may result in harmful, beneficial, or neutral effects to the structure and function of the organism.</p> <p>2) Distinguish between mitosis and meiosis and compare the resulting daughter cells.</p> <p>3) Predict the probability of individual dominant and recessive alleles to be transmitted from each parent to offspring during sexual reproduction and represent the phenotypic and genotypic patterns using ratios.</p>	<p>FOSS Next Generation <i>Diversity of Life</i> TE: Investigation 7; Parts 1-2 SE: <i>Mendel and Punnett Squares</i> DR: Genes and Heredity</p> <p>NOTE: Standard also addressed in Grade 8: FOSS Next Generation Heredity and Adaptation TE: Investigation 2</p>

Earth and Space Science

State Standard	FOSS Program
7.ESS3: Earth and Human Activity	
<p>1) Graphically represent the composition of the atmosphere as a mixture of gases and discuss the potential for atmospheric change.</p>	<p>This standard was addressed: Grade 6: FOSS Next Generation Weather and Water TE: Investigation 1; Part 3 SE: <i>What's in the Air?, A Thin Blue Veil</i></p>
<p>2) Engage in a scientific argument through graphing and translating data regarding human activity and climate.</p>	<p>This standard was addressed: Grade 6: FOSS Next Generation Weather and Water TE: Investigation 9; Parts 1-3 SE: <i>Climates: Past, Present and Future</i> DR: Climate Blog, Greenhouse Gas Simulator, Human Caused Sources of Carbon Dioxide, Water Cycle, CO2 in the Ice Core Record, Carbon Cycle, Climate Change Basics, Earth's Climate Over Time Slide Show</p>

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Grade 7
 Physical Science

State Standard	FOSS Program
7.PS1: Matter and Its Interactions	
1) Develop and use models to illustrate the structure of atoms, including the subatomic particles with their relative positions and charge.	FOSS Next Generation Chemical Interactions TE: Investigation 2; Parts 1-2 SE: <i>Elements, Substances on Earth, Elements in the Universe</i> DR: <i>Periodic Table of the Elements</i>
2) Compare and contrast elemental molecules and compound molecules.	FOSS Next Generation Chemical Interactions TE: Investigation 2; Parts 1-2 Investigation 7; Parts 1-2 Investigation 9; Part 1 SE: <i>Elements, Substances on Earth, Elements in the Universe, How Things Dissolve, Concentration, Better Living Through Chemistry, How Do Atoms Rearrange</i> DR: <i>Periodic Table of the Elements, Explore Dissolving</i>
3) Classify matter as pure substances or mixtures based on composition.	FOSS Next Generation Chemical Interactions TE: Investigation 2; Parts 1-2 Investigation 7; Parts 1-2 Investigation 9; Part 1 SE: <i>Elements, Substances on Earth, Elements in the Universe, How Things Dissolve, Concentration, Better Living Through Chemistry, How Do Atoms Rearrange</i> DR: <i>Periodic Table of the Elements, Explore Dissolving</i>
4) Analyze and interpret chemical reactions to determine if the total number of atoms in the reactants and products support the Law of Conservation of Mass.	FOSS Next Generation Chemical Interactions TE: Investigation 3; Parts 1-3 Investigation 9; Parts 1-3 Investigation 10; Parts 1-2 SE: <i>Particles, Three Phases of Matter, Careers in Chemistry, Element Hunters</i> DR: <i>Gas in a Syringe, Particles in Gases, Better Living Through Chemistry, How Do Atoms Rearrange?, Fireworks, Antoine-Laurent Lavoisier, Organic Compounds</i>
5) Use the periodic table as a model to analyze and interpret evidence relating to physical and chemical properties to identify a sample of matter	FOSS Next Generation Chemical Interactions TE: Investigation 2; Parts 1-2 SE: <i>Elements, Substances on Earth, Elements in the Universe</i> DR: <i>Periodic Table of the Elements</i>
6) Create and interpret models of substances whose atoms represent the states of matter with respect to temperature and pressure.	FOSS Next Generation Chemical Interactions TE: Investigation 4; Parts 1-3 Investigation 5; Parts 1-3 Investigation 8; Parts 1-4 SE: <i>Particles in Motion, Three Phases of Matter, Expansion and Contraction, Energy on the Move, Rock Solid,</i> DR: <i>Particles in Solids, Liquids, Gases; Energy Transfer by Collision, Mixing Hot and Cold Water, Thermometer, Energy Flow, Heat of Fusion, Hoar Frost</i>

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Grade 7
 Engineering Design

State Standard	FOSS Program
<p>7.ETS2: Links Among Engineering, Technology, and Applications of Science</p> <p>1) Examine a problem from the medical field pertaining to biomaterials and design a solution taking into consideration the criteria, constraints, and relevant scientific principles of the problem that may limit possible solutions.</p>	<p>FOSS Next Generation <i>Variables and Design</i> TE: Investigation 1, Parts 1-3 Investigation 2, Parts 1-2 Investigation 3, Parts 1-2 SE: <i>What do Scientists and Engineers Do?, What's a Trolley?, Keep Your Variables under Control, Efficiency, Lead Detector, Solar Tents, The Problem of Traffic, Digital Manufacturing, Spotlighting Engineers, Robotics</i> DR: <i>Blasto, Virtual Aquarium, What's an Engineer?, Engineering Problems, Zip Line, Bridge Design, Engineering Design Cycle, Enable Tech, Maker Space, Jumping Robot, Genetic Engineering, 3D Printing Explored, 3D-Printed Home</i></p> <p>FOSS Next Generation <i>Diversity of Life</i> TE: Investigation 9; Part 2 SE: <i>Viruses, Living or Nonliving?</i> DR: <i>Flu Attack! Viruses on the Attack</i></p>

Grade 8

Life Science

State Standard	FOSS Program
8.LS4: Biological Change: Unity and Diversity	
1) Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change in life forms throughout Earth's history.	FOSS Next Generation Heredity and Adaptation TE: Investigation 1; Parts 1-2 SE: <i>Fossil Dating, Mass Extinctions</i> DR: Biodiversity, Fossils FOSS Next Generation Earth History TE: Investigation 4; Parts 1-3
2) Construct an explanation addressing similarities and differences of the anatomical structures and genetic information between extinct and extant organisms using evidence of common ancestry and patterns between taxa.	FOSS Next Generation Heredity and Adaptation TE: Investigation 1; Parts 1-2 Investigation 2; Part 1 SE: <i>Fossil Dating, Mass Extinctions, Tree Thinking</i> DR: Biodiversity, Fossils
3) Analyze evidence from geology, paleontology, and comparative anatomy to support that specific phenotypes within a population can increase the probability of survival of that species and lead to adaptation	FOSS Next Generation Heredity and Adaptation TE: Investigation 2; Parts 2-4 SE: <i>Understanding Heredity, A Larkey Yammer, Mendel and Punnett Squares, Mapping the Human Genome</i> DR: Heredity, A Model for Predicting Genetic Variation, Larkey Impossible Traits, Larkey Punnett Squares
4) Develop a scientific explanation of how natural selection plays a role in determining the survival of a species in a changing environment.	FOSS Next Generation Heredity and Adaptation TE: Investigation 3; Parts 1-2 SE: <i>Adaptation, Natural Selection, What Makes a Scientific Theory,</i> DR: Walking Sticks: Find Insects, Walking Sticks: Find Insects inn Three Environments, Larkey Natural Selection, The Making of the Fittest: Natural Selection and Adaptation, The Origin of Species: The Beak of the Finch, Biodiversity Slide Show
5) Obtain, evaluate, and communicate information about the technologies that have changed the way humans use artificial selection to influence the inheritance of desired traits in other organisms	FOSS Next Generation Heredity and Adaptation TE: Investigation 3; Part 3 SE: <i>Influencing Evolution</i> DR: Genetic Technology Resources

Earth and Space Science

State Standard	FOSS Program
8.ESS1: Earth's Place in the Universe	
1) Research, analyze, and communicate that the universe began with a period of rapid expansion using evidence from the motion of galaxies and composition of stars.	Delta Science Reader (6-8) Astronomy
2) Explain the role of gravity in the formation of our sun and planets. Extend this explanation to address gravity's effect on the motion of celestial objects in our solar system and Earth's ocean tides.	Delta Science Reader (6-8) Earth, Moon, and Sun

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State Standard	FOSS Program
8.ESS2: Earth's Systems	
1) Analyze and interpret data to support the assertion that rapid or gradual geographic changes lead to drastic population changes and extinction events.	FOSS Next Generation Earth History TE: Investigation 4; Parts 1-3 Investigation 8; Parts 1-3 SE: <i>A Fossil Primer, Rocks, Fossils and Time; Floating on a Prehistoric Sea, Geoscenario Introduction: Glaciers, Coal, Yellowstone Hotspot, Oil</i> DR: Rock Column Movie Maker, Timeliner, Index-Fossil Correlation, Dating Rock Layers, GeoScenarios,
2) Evaluate data collected from seismographs to create a model of Earth's structure.	FOSS Next Generation Earth History TE: Investigation 5; Part 1 Investigation 6; Parts 1-3 SE: <i>Volcanoes, The History of the The Theory of Plate Tectonics, Historical Debates about a Dynamic Earth</i> DR: Earth's Interior, Volcano Plotting Activity, Volcanoes Around the World, Volcanoes, Earthquake-Plotting Activity, Earthquakes Around the World, Mt. St. Helens: The Eruption Impact, Shake Alert, Wegener, Plate Boundaries Map, NOAA Plate Tectonics
3) Describe the relationship between the processes and forces that create igneous, sedimentary, and metamorphic rocks.	FOSS Next Generation Earth History TE: Investigation 2; Parts 1-3 Investigation 3; Parts 1-3 Investigation 5; Parts 1-3 Investigation 7; Part 2 SE: <i>Grand Canyon Flood, Weathering and Erosion, Where in the World is Calcium Carbonate?, Minerals, Crystals and Rocks, Rock Transformations, How One Rock Becomes Another Rock</i> DR: Stream Table: High Flow vs. Low Flow, High Slope vs. Low Slope, Heterogeneous vs. Homogeneous Material; Glen Canyon Dam High Flow Experiment, USGS, Debris Flow, Frost Wedging, Rock Fall, Soil Stories, Sandstone Formation, Rock Database, Shale Formation, Zion National Park Expedition, Limestone Formation, Rock Column Movie Maker, Sedimentary Rocks Tour, Pacific Northwest Tour, Yosemite National Park Tour, Hawaii Tour, Extrusive Rock Formation, Intrusive Rock Formation, Salol Crystal Formation, Earth's Interior Slide show, Appalachian Mountain Tour, How Metamorphic Rocks Form, Slate
4) Gather and evaluate evidence that energy from the earth's interior drives convection cycles within the asthenosphere which creates changes within the lithosphere including plate movements, plate boundaries, and seafloor spreading.	FOSS Next Generation Earth History TE: Investigation 6; Part 3 SE: <i>The History of the Theory of Plate Tectonics, Historical Debates about a Dynamic Earth,</i> DR: Plate Boundaries Map, Convection Tank, NOAA Plate Tectonics
5) Construct a scientific explanation using data that explains the gradual process of plate tectonics accounting for A) the distribution of fossils on different continents, B) the occurrence of earthquakes, and C) continental and ocean floor features (including mountains, volcanoes)	FOSS Next Generation Earth History TE: Investigation 6; Parts1- 3 Investigation 7; Part 1 SE: <i>Volcanoes, Volcano Plotting Activity, Volcanoes Around the World, Volcanoes, Earthquake-Plotting Activity, Earthquakes Around the World, Mt. St. Helens: The Eruption Impact, Shake Alert, Wegener, The History of the Theory of Plate Tectonics, Historical Debates about a Dynamic Earth, Earth's Dynamic Systems</i> DR: Plate Boundaries Map, Convection Tank, NOAA Plate Tectonics, Convergent Boundary, Divergent Boundary,

TE: Teacher Editions-Investigations Guide, Teacher Resources • SE: Student Edition-Science Resources Book • DR: Digital Resources

Grade 8

	Transform Boundary, Folding, Volcanoes Around the World, Mountain Types slide show
State Standard	FOSS Program
8.ESS3: Earth and Human Activity	
1) Interpret data to explain that earth's mineral, fossil fuel, and groundwater resources are unevenly distributed as a result of geologic processes.	FOSS Next Generation Earth History TE: Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 SE: <i>Geoscenario Introduction: Glaciers, Coal, Yellowstone Hotspot, Oil; Research Careers in the Lab and Field</i> DR: Geoscenarios, Timeliner, Rock Column Movie Maker, Grand Canyon Revisited, Colorado Plateau Over Time

Physical Science

State Standard	FOSS Program
8.PS2: Motion and Stability: Forces and Interactions	
1) Design and conduct investigations depicting the relationship between magnetism and electricity in electromagnets, generators, and electrical motors, emphasizing the factors that increase or diminish the electric current and the magnetic field strength.	FOSS Next Generation Electromagnetic Force TE: Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 SE: <i>Circuitry and Lightbulbs, What is Electricity? Electromagnetism, Engineering Design Process, Electromagnetic Engineering, Motor Dissection A, Motor Dissection B, Generator Dissection, The Rebirth of Electric Cars, Where We Get Energy,</i> DR: Lighting a Bulb, Virtual Electromagnet, Generator Dissection
2) Conduct an investigation to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	FOSS Next Generation Electromagnetic Force TE: Investigation 2; Parts 1-3 SE: <i>Magnetic Force</i> DR: Magnetism, Adding Magnetic Fields
3) Create a demonstration of an object in motion and describe the position, force, and direction of the object.	FOSS Next Generation Electromagnetic Force TE: Investigation 1; Parts 1-3 SE: <i>The Force is With You, The Discovery of Friction, Net Force</i> DR: Forces
4) Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	FOSS Next Generation Electromagnetic Force TE: Investigation 1; Parts 1-3 SE: <i>The Force is With You, The Discovery of Friction, Net Force</i> DR: Forces
5) Evaluate and interpret that for every force exerted on an object there is an equal force exerted in the opposite direction.	FOSS Next Generation Electromagnetic Force TE: Investigation 1; Parts 1-3 SE: <i>The Force is With You, The Discovery of Friction, Net Force</i> DR: Forces
State Standard	FOSS Program
8.PS4: Waves and Their Applications in Technologies for Information Transfer	
1) Develop and use models to represent the basic properties of waves including frequency, amplitude, wavelength, and speed.	FOSS Next Generation Waves TE: Investigation 1; Parts 1-2 SE: <i>Transverse and Compression Waves</i> DR: Metronome, Standing Wave
2) Compare and contrast mechanical waves and electromagnetic	FOSS Next Generation Waves

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Grade 8

<p>waves based on refraction, reflection, transmission, absorption, and their behavior through a vacuum and/or various media.</p>	<p>TE: Investigation 2; Parts 1-3 Investigation 3; Parts 1-4 SE: <i>Ocean Waves, Tsunamis, The Tacoma Narrows Bridge Disaster, Engineering Design Process, Sound Waves, Acoustic Engineering, Reflecting on Light, Electromagnetic Spectra, Electromagnetic Radiation and Human Health, Throw a Little Light on Sight, Seismic Waves</i> DR: Big Waves, Tacoma Narrows Bridge Collapse 1, Oscilloscope, Soundproof Engineering, Refraction</p>
<p>3) Evaluate the role that waves play in different communication systems.</p>	<p>FOSS Next Generation Waves TE: Investigation 4; Parts 1-3 SE: <i>Lasers, Digital Communication, Telecommunication</i> DR: Fiber Optics, Digitized Images</p>

Engineering Design

State Standard	FOSS Program
<p>8.ETS1: Engineering Design</p> <p>1) Develop a model to generate data for ongoing testing and modification of an electromagnet, a generator, and a motor such that an optimal design can be achieved.</p> <p>2) Research and communicate information to describe how data from technologies (telescopes, spectrometers, satellites, and space probes) provide information about objects in the solar system and universe.</p>	<p>FOSS Next Generation <i>Electromagnetic Force</i> TE: Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 SE: <i>Circuitry and Lightbulbs, What is Electricity? Electromagnetism, Engineering Design Process, Electromagnetic Engineering, Motor Dissection A, Motor Dissection B, Generator Dissection, The Rebirth of Electric Cars, Where We Get Energy,</i> DR: Lighting a Bulb, Virtual Electromagnet, Generator Dissection</p>