

Grade 6
 Life Science (LS)

Cellular to Multicellular

This topic focuses on the study of the basics of Modern Cell Theory. All organisms are composed of cells, which are the fundamental unit of life. Cells carry on the many processes that sustain life. All cells come from pre-existing cells.

State Standard	FOSS/Delta Program
Cellular to Multicellular	FOSS Next Generation Diversity of Life
<p>6.LS.1: Cells are the fundamental unit of life. All living things are composed of cells. Different body tissues and organs are made of different kinds of cells. The ways cells function are similar in all living organisms.</p> <p>Note: <i>Emphasis should be placed on the function and coordination of cell organelles as well as their roles in overall cell function.</i></p>	<p>IG: Investigation 1; Parts 1-2 Investigation 2; Parts 1-3 Investigation 3; Parts 1-4 Investigation 4; Parts 1-4 Investigation 5; Parts 1-3 Investigation 8; Parts 1-2 Investigation 9; Part 2</p> <p>SRB: <i>Characteristics of Life on Earth, The History of Microscopes, The Amazing Paramecium, Microorganism Guide, Cells, How Big Are Cells?, Levels of Complexity: Animal Cells, Levels of Complexity: Comparing Research Pages, Bacteria Around Us, Archaea Family Album, The Three Domains of Life, The Water Conservation Problem, Water, Light and Energy, Those Amazing Insects, Insect Structure and Function, Viruses: Living or Nonliving?</i></p> <p>DOR: <i>Camphor Crystals, Virtual Microscope, Microscope Measurement, Database: Brine Shrimp Eating, Database: Brine Shrimp, Lab Techniques: Making a Brine Shrimp Slide, Database: Elodea Cells, Database: Elodea Cytoplasmic Streaming, Levels of Complexity: Plant Cell, Lab Technique: Making a Wet Mount, Database: Paramecium Collection, Levels of Complexity: Protist Cell, Lab Techniques: Preparing a Paramecium Wet-Mount Slide, Lab Techniques: Using Cotton to Slow Paramecia, Database: Microorganism Collection, Database: Human Cheek Cells, Levels of Complexity: Animal Cell, Lab Techniques: Preparing a Human Cheek Tissue Slide, Levels of Complexity: Card Sort, The Scale of the Universe, Lab Technique: Preparing an Agar Plate, Lab Techniques: Inoculating an Agar Plate, Database: Yogurt Bacteria, Levels of Complexity: Bacterial Cell, A Million Dollars, Exponential Growth, Fungus, Levels of Complexity: Archaeal Cell, Classification History, Database: Stem Collection, Database: Stomata Collection, Levels of Complexity: Plant Vascular System, Database: Insect Collection, Levels of Complexity, Flu Attack, Viruses on the Attack</i></p>
<p>6.LS.2: All cells come from pre-existing cells. Cells repeatedly divide resulting in more cells and growth and repair in multicellular organisms.</p> <p>Note: <i>This is not a detailed discussion of the phases of mitosis or meiosis. The focus should be on reproduction as a means of transmitting genetic information from one generation to the next, cellular growth and repair.</i></p>	<p>FOSS Next Generation Diversity of Life</p> <p>IG: Investigation 1; Parts 1-2 Investigation 2; Parts 1-3 Investigation 3; Part 2 Investigation 6; Parts 1-4</p> <p>SRB: <i>Characteristics of Life on Earth, The History of Microscopes, The Amazing Paramecium, Breeding Salt Tolerant Wheat, The Making of a New Plant, Seed on the Move,</i></p> <p>DOR: <i>Camphor Crystals, Virtual Microscope, Microscope Measurement, Database: Brine Shrimp Eating, Database:</i></p>

IG: Investigations Guide • TR: Teacher Resources • SRB: Student Science Resources Book • DOR: Digital-Only Resources
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	<p><i>Brine Shrimp, Lab Techniques: Making a Brine Shrimp Slide, Database: Paramecium Collection, Lab Techniques: Using Cotton to Slow Paramecia, Database: Flower Collection, Database: Seed Collection, Nonflowering Plants, Lab Techniques: Preparing the Flower Dissection Mount, Database: Pollinator Collection, Pollinators Game,</i></p>
<p>6.LS.3: Cells carry on specific functions that sustain life. Many basic functions of organisms occur in cells. Cells take in nutrients and energy to perform work, like making various molecules required by that cell or an organism.</p> <p>Every cell is covered by a membrane that controls what can enter and leave the cell.</p> <p>Within the cell are specialized parts for the transport of materials, energy capture and release, protein building, waste disposal, information feedback and movement.</p> <p>Note: <i>Emphasis should be placed on the function and coordination of cell components, as well as on their roles in overall cell function.</i></p>	<p>FOSS Next Generation Diversity of Life</p> <p>IG: Investigation 1; Parts 1-2 Investigation 2; Parts 1-3 Investigation 3; Parts 1-4 Investigation 4; Parts 1-4 Investigation 5; Parts 1-3 Investigation 6; Parts 1-4 Investigation 8; Parts 1-2 Investigation 9; Part 2</p> <p>SRB: <i>Characteristics of Life on Earth, The History of Microscopes, The Amazing Paramecium, Breeding Salt Tolerant Wheat, The Making of a New Plant, Seed on the Move, Microorganism Guide, Cells, How Big Are Cells?, Levels of Complexity: Animal Cells, Levels of Complexity: Comparing Research Pages, Bacteria Around Us, Archaea Family Album, The Three Domains of Life, The Water Conservation Problem, Water, Light and Energy, Those Amazing Insects, Insect Structure and Function, Viruses: Living or Nonliving?</i></p> <p>DOR: <i>Camphor Crystals, Virtual Microscope, Microscope Measurement, Database: Brine Shrimp Eating, Database: Brine Shrimp, Lab Techniques: Making a Brine Shrimp Slide, Database: Elodea Cells, Database: Elodea Cytoplasmic Streaming, Levels of Complexity: Plant Cell, Lab Technique: Making a Wet Mount, Database: Paramecium Collection, Levels of Complexity: Protist Cell, Lab Techniques: Preparing a Paramecium Wet-Mount Slide, Lab Techniques: Using Cotton to Slow Paramecia, : Flower Collection, Database: Seed Collection, Nonflowering Plants, Lab Techniques: Preparing the Flower Dissection Mount, Database: Pollinator Collection, Pollinators Game, Database: Microorganism Collection, Database: Human Cheek Cells, Levels of Complexity: Animal Cell, Lab Techniques: Preparing a Human Cheek Tissue Slide, Levels of Complexity: Card Sort, The Scale of the Universe, Lab Technique: Preparing an Agar Plate, Lab Techniques: Inoculating an Agar Plate, Database: Yogurt Bacteria, Levels of Complexity: Bacterial Cell, A Million Dollars, Exponential Growth, Fungus, Levels of Complexity: Archaean Cell, Classification History, Database: Stem Collection, Database: Stomata Collection, Levels of Complexity: Plant Vascular System, Database: Insect Collection, Levels of Complexity, Flu Attack, Viruses on the Attack</i></p>

Grade 6

Earth and Space Science (ESS)

Rocks, Minerals and Soil

This topic focuses on the study of rocks, minerals and soil, which make up the lithosphere. Classifying and identifying different types of rocks, minerals and soil can decode the past environment in which they formed.

State Standard	FOSS/Delta Program
<p>Rocks, Minerals and Soil</p> <p>6.ESS.1: Minerals have specific, quantifiable properties. Minerals are naturally occurring, inorganic solids that have a defined chemical composition. Minerals have properties that can be observed and measured. Minerals form in specific environments.</p> <p>Note: <i>The emphasis is on learning how to identify the mineral by conducting tests (not through memorization).</i></p>	<p>ScienceFLEX: <i>Minerals, Rocks and Fossils</i> IG: Lesson 1 Lesson 2 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Minerals, Rocks and Fossils</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p> <p>Also, Delta Science Module 3rd Edition: <i>Rocks and Minerals</i> Investigations 1, 2, 3, 4, 5, 6, 7, 8, 9, 12 SRB: Delta Science Reader: <i>Rocks and Minerals</i></p>
<p>6.ESS.2: Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification. Most rocks are composed of one or more minerals, but there are a few types of sedimentary rocks that contain organic material, such as coal. The composition of the rock, types of mineral present, and/or mineral shape and size can be used to identify the rock and to interpret its history of formation, breakdown (weathering) and transport (erosion).</p>	<p>ScienceFLEX: <i>Minerals, Rocks and Fossils</i> IG: Lesson 2 Lesson 3 Lesson 4 Lesson 5 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Minerals, Rocks and Fossils</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p> <p>Also, Delta Science Module 3rd Edition: <i>Rocks and Minerals</i> Investigations 1, 2, 9, 12 SRB: Delta Science Reader: <i>Rocks and Minerals</i></p>
<p>6.ESS.3: Igneous, metamorphic and sedimentary rocks form in different ways. Magma or lava cools and crystallizes to form igneous rocks. Heat and pressure applied to existing rock forms metamorphic rocks. Sedimentary rock forms as existing rock weathers chemically and/or physically and the weathered material is compressed and then lithifies. Each rock type can provide information about the environment in which it was formed.</p>	<p>ScienceFLEX: <i>Minerals, Rocks and Fossils</i> IG: Lesson 3 Lesson 4 Lesson 5 Lesson 6 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Minerals, Rocks and Fossils</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p> <p>Also, Delta Science Module 3rd Edition: <i>Rocks and Minerals</i> Investigations 1, 2, 9, 12 SRB: Delta Science Reader: <i>Rocks and Minerals</i></p>
<p>6.ESS.4: Soil is unconsolidated material that contains nutrient matter and weathered rock. Soil formation occurs at different rates and is based on environmental conditions, types of existing bedrock and rates of weathering. Soil forms in layers known as horizons. Soil horizons can be distinguished from one another based on properties that can be measured. The terms dirt and soil are not synonymous, use the term "soil".</p>	<p>ScienceFLEX <i>The Dirt on Dirt</i> IG: Lesson 1 Lesson 2 Lesson 3 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Minerals, Rocks and Fossils</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p>

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<p>Note: <i>The emphasis should be on properties of soil rather than memorization.</i></p>	
<p>6.ESS.5: Rocks, minerals and soils have common and practical uses.</p> <p>Nearly all manufactured material requires some kind of geologic resource. Most geologic resources are considered nonrenewable. Rocks, minerals and soil are examples of geologic resources that are nonrenewable.</p>	<p>ScienceFLEX: <i>Minerals, Rocks and Fossils</i> IG: Lesson 1 Lesson 2 Lesson 3 Lesson 4 Lesson 5 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Minerals, Rocks and Fossils</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p> <p>ScienceFLEX <i>The Dirt on Dirt</i> IG: Lesson 5 Lesson 6 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Minerals, Rocks and Fossils</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p>

Physical Science (PS)

Matter and Motion

This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, and kinetic and potential energy.

State Standard	FOSS/Delta Program
<p>Matter and Motion</p> <p>6.PS.1: Matter is made up of small particles called atoms.</p> <p>Matter has mass, volume and density and is made up of particles called atoms.</p> <p>Elements are a class of substances composed of a single kind of atom.</p> <p>Molecules are the combination of two or more atoms that are joined together chemically.</p>	<p>Delta Science Content Reader (2 reading levels): <i>Properties of Matter</i></p> <p>Note: Standard addressed Grade 7 FOSS Next Generation <i>Chemical Interactions</i>: Investigation 1; Parts 1-2 Investigation 2; Parts 1-2 Investigation 9; Parts 1-3 Investigation 10; Part 2</p>
<p>6.PS.2: Changes of state are explained by a model of matter composed of particles that are in motion.</p> <p>Temperature is a measure of the average motion of the particles in a substance.</p> <p>Heat is a process of energy transfer rather than a type of energy. Energy transfer can result in a change in temperature or a phase change.</p> <p>When substances undergo changes of state, atoms change their</p>	<p>ScienceFLEX: <i>Energy and the States of Matter</i> IG: Lesson 2 Lesson 3 Lesson 4 Lesson 5 Lesson 6 Lesson 7 Lesson 8 SRB: ScienceFLEX Student Reader (4 reading levels) <i>Energy and the States of Matter</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p>

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<p>motion and position.</p> <p>Note: <i>It is not the intent of this standard to encourage vocabulary identification (matching definitions with heat, temperature, and thermal energy). Instead, these are provided as conceptual tools for understanding the role of energy in physical, biotic, atmospheric, oceanic, and geologic systems covered in grade 6 and subsequent grades and courses.</i></p>	<p>Note: Standard reviewed Grade 7 FOSS Next Generation Chemical Interactions: Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 Investigation 5; Parts 1-3 Investigation 6; Parts 1 Investigation 7; Parts 1-2 Investigation 8; Parts 1-4 Investigation 10; Part 2</p>
<p>6.PS.3: There are two categories of energy: kinetic and potential. Objects and substances in motion have kinetic energy.</p> <p>Objects and substances can have energy as a result of their position (potential energy).</p> <p>Note: <i>Chemical and elastic potential energy should not be included at this grade; this is found in PS grade 7.</i></p>	<p>Delta Science Module 3rd Edition: Newton’s Toy Box Delta Science Reader: Newton’s Toy Box</p> <p>ScienceFLEX Force, Motion and Gravity SRB: ScienceFLEX Student Reader (4 reading levels) <i>Force, Motion and Gravity</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p> <p>Note: Standard reviewed Grade 8 FOSS Generation Gravity and Kinetic Energy</p>
<p>6.PS.4: An object’s motion can be described by its speed and the direction in which it is moving.</p> <p>An object’s position and speed can be measured and graphed as a function of time.</p> <p>Note: <i>Velocity and acceleration rates should not be included at this grade level; these terms are introduced in high school.</i></p>	<p>Delta Science Module 3rd Edition: Newton’s Toy Box Delta Science Reader: Newton’s Toy Box</p> <p>Delta Science Content Reader (2 reading levels): <i>Forces and Motion</i></p> <p>ScienceFLEX: Force, Motion and Gravity SRB: ScienceFLEX Student Reader (4 reading levels) <i>Force, Motion and Gravity</i> DOR: Augmented Reality images using free App, PowerPoint Slides,</p> <p>Note: Standard reviewed Grade 8 FOSS Generation Gravity and Kinetic Energy</p>

Grade 7
Life Science (LS)

Cycles of Matter and Flow of Energy

This topic focuses on the impact of matter and energy transfer within the biotic component of ecosystems.

State Standard	FOSS/Delta Program
<p>Cycles of Matter and Flow of Energy</p> <p>7.LS.1: Energy flows and matter is transferred continuously from one organism to another and between organisms and their physical environments. Plants use the energy in light to make sugars out of carbon dioxide and water (photosynthesis). These materials can be used or stored for later use. Organisms that eat plants break down plant structures to release the energy and produce the materials they need to survive. The organism may then be consumed by other organisms for materials and energy.</p> <p>Energy can transform from one form to another in living things. Animals get energy from oxidizing food, releasing some of its energy as heat.</p> <p>The total amount of matter and energy remains constant, even though its form and location change.</p>	<p>FOSS Next Generation Populations and Ecosystems IG: Investigation 3; Parts 2-3 Investigation 5, Parts 1-4 Investigation 6; Parts 1-4 SRB: <i>Biosphere2: An Experiment in Isolation, 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> DOR: <i>Plant and Animal Care, Ecoscenarios, Biomes,</i></p>
<p>7.LS.2: In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors. The variety of physical (abiotic) conditions that exists on Earth gives rise to diverse environments (biomes) and allows for the existence of a wide variety of organisms (biodiversity).</p> <p>Biomes are regional ecosystems characterized by distinct types of organisms that have developed under specific soil and climatic conditions.</p> <p>Ecosystems are dynamic in nature; the number and types of species fluctuate over time. Disruptions, deliberate or inadvertent, to the physical (abiotic) or biological (biotic) components of an ecosystem impact the composition of an ecosystem.</p>	<p>FOSS Next Generation Populations and Ecosystems IG: Investigation 1; Parts 1-3 Investigation 2; 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 SRB: <i>Observations and Inferences, Milkweed Bugs, Life in a Community, Ecoscenarios Introductions, Defining a Biome, Mono Lake, Biosphere2: An Experiment in Isolation, Limiting Factors, Mono Lake Throughout the Year, Biodiversity, Invasive Species,</i> DOR: <i>Ecoscenarios, Biomes, Among the Wild Chimpanzees, Mono Lake Foodwebs, Organism Database, The Mono Lake Story, Plant and Animal Care, Milkweed Bugs Unlimited, Milkweed Bugs Limited, Hawaii: Strangers in Paradise, Ecoscenario Research Center</i></p>

Grade 7
Earth and Space Science (ESS)

Cycles of Matter and Flow of Energy

This topic focuses on the impact of matter and energy transfer within the biotic component of ecosystems.

State Standard	FOSS/Delta Program
<p>7.ESS.1: The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere. Thermal energy is transferred as water changes state throughout the cycle. The cycling of water in the atmosphere is an important part of weather patterns on Earth. The rate at which water flows through soil and rock is dependent upon the porosity and permeability of the soil or rock.</p>	<p>Next Generation FOSS <i>Weather and Water</i> IG: Investigation 3; Parts 1-3 Investigation 7; Parts 1-3 Investigation 8; Parts 1-3 SRB: <i>Density, Density with Dey, Convection, Weather, Balloons and the Radiosonde, Animal Rains, Earth: The Water Planet</i> DOR: <i>Particles in Solids, Liquids and Gases; Fluid Convection, Energy: Transfer, Conduction, Radiation, Convection; Convection Chamber in Action, Cloud in a Bottle, Water Cycle</i></p>
<p>7.ESS.2: Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns. The sun is the major source of energy for wind, air and ocean currents and the hydrologic cycle. As thermal energy transfers occur in the atmosphere and ocean, currents form. Large bodies of water can influence weather and climate. The jet stream is an example of an atmospheric current and the Gulf Stream is an example of an oceanic current. Ocean currents are influenced by factors other than thermal energy, such as water density, mineral content (such as salinity), ocean floor topography and Earth's rotation. All of these factors delineate global climate patterns on Earth.</p>	<p>Next Generation FOSS <i>Weather and Water</i> IG: Investigation 1; Part 2 Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 Investigation 5; Parts 1 Investigation 6; Parts 1-3 Investigation 7; Parts 2-3 Investigation 8; Parts 1-3 Investigation 9; Parts 1-3 Investigation 10; Parts 1-4 SRB: <i>Density, Density with Dey, Thermometer: A Device to Measure Temperature, Heating the Atmosphere, Wind on Earth, Weather Balloons and the Radiosonde, Earth: The Water Planet, Ocean Currents and Gyres, El Nino, Climates: Past, Present and Future, Severe Weather</i> DOR: <i>Gas in a Syringe, Particles in Solids, Liquids, and Gases; Fluid Convection, Energy Transfer: Conduction, Radiation, Convection; Energy Transfer by Collision, Conduction through Metals Cloud in a Bottle, Water Cycle, Perpetual Ocean, Climate Blog, CO2 in the Ice Core Record, Earth's Climate Over Time, Greenhouse-Gases Simulator, Human-Caused Sources of Carbon Dioxide, Carbon Cycle, Climate Change Basics</i></p>
<p>7.ESS.3: The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere. The atmosphere is held to the Earth by the force of gravity. There are defined layers of the atmosphere that have specific properties, such as temperature, chemical composition and physical characteristics. Gases in the atmosphere include nitrogen, oxygen, water vapor, carbon dioxide and other trace gases. Biogeochemical cycles illustrate the movement of specific elements or molecules (such as carbon or nitrogen) through the lithosphere, biosphere, hydrosphere and atmosphere.</p> <p>Note: <i>The emphasis is on why the atmosphere has defined layers, not on naming the layers.</i></p>	<p>Next Generation FOSS <i>Weather and Water</i> IG: Investigation 1; Parts 1-3 Investigation 6; Parts 1-3 Investigation 7; Parts 1-3 Investigation 9; Part 2 SRB: <i>Severe Weather, What's in the Air, A Thin Blue Veil, Heating the Atmosphere, Sea Breeze, Land Breeze, Wind on Earth, Weather Balloons and the Radiosonde, Climates: Past, Present, and Future</i> DOR: <i>Gas in a Syringe, Weather Balloon Simulation, Elevator to Space, Local Wind, Wind on Earth, NOAA Ridge, Red Spot Movie, Cloud in a Bottle, Greenhouse Gas Simulator, Human-Caused Sources of Carbon Dioxide, Carbon Cycle</i></p>

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<p>7.ESS.4: The relative patterns of motion and positions of Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon. The moon's orbit and its change of position relative to Earth and sun result in different parts of the moon being visible from Earth (phases of the moon).</p> <p>A solar eclipse is when Earth moves into the shadow of the moon (during a new moon). A lunar eclipse is when the moon moves into the shadow of Earth (during a full moon).</p> <p>Gravitational force between Earth and the moon causes daily oceanic tides. When the gravitational forces from the sun and moon align (at new and full moons) spring tides occur. When the gravitational forces of the sun and moon are perpendicular (at first and last quarter moons), neap tides occur.</p>	<p>Delta Science Module, 3rd Edition: <i>Earth, Moon and Sun</i> IG: Lesson 1 Lesson 2 Lesson 3 Lesson 4 Lesson 5 Lesson 6 Lesson 7 Lesson 8 Lesson 9 Lesson 10 Lesson 11 Lesson 12 Lesson 13 Delta Science Reader <i>Earth, Moon, and Sun</i></p>
<p>7.ESS.5: The relative positions of Earth and the sun cause patterns we call seasons. Earth's axis is tilted at an angle of 23.5°. This tilt along with Earth's revolution around the sun, affects the amount of direct sunlight that the earth receives in a single day and throughout the year. The average daily temperature is related to the amount of direct sunlight received.</p>	<p>Next Generation FOSS <i>Weather and Water</i> IG: Investigation 4; Parts 1-3 SRB: <i>Seasons, Thermometer: A Device to Measure Temperature</i> DOR: <i>Longitude and Latitude Simulation, Energy Transfer: Conduction, Radiation, Convection; Seasons</i></p>

Physical Science (PS)

Matter and Motion

This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, and kinetic and potential energy.

State Standard	FOSS/Delta Program
<p>Matter and Motion</p> <p>7.PS.1: Elements can be organized by properties. Elements can be classified as metals, non-metals and metalloids, and can be organized by similar properties such as color, solubility, hardness, density, conductivity, melting point and boiling point, viscosity, and malleability.</p> <p>Note 1: <i>This is the conceptual introduction of the Periodic Table of Elements and should be limited to classifications based on observable properties; it should not include the names of the families.</i></p>	<p>FOSS Next Generation: <i>Chemical Interactions</i> IG: Investigation 1; Parts 1-2 Investigation 2; Parts 1-2 SRB: <i>White Substance Information, Elements, Substances on Earth, Elements in the Universe</i> DOR: <i>Two Substance Reactions, Periodic Table of Elements,</i></p>
<p>7.PS.2: Matter can be separated or changed, but in a closed system, the number and types of atoms remains constant. When substances interact and form new substances the properties of the new substances may be very different from those of the original substances, but the amount of mass does not change.</p> <p>Physically combining two or more substances form a mixture, which can be separated through physical processes.</p>	<p>FOSS Next Generation <i>Chemical Interactions:</i> IG: Investigation 3; Parts 1-3 Investigation 7; Parts 1-2 Investigation 8; Parts 1-4 Investigation 9; Parts 1-3 SRB: <i>Particles, Three Phases of Matter, How Things Dissolve, Concentration, Rock Solid, Heat of Fusion, Better Living Through Chemistry, How Do Atoms Rearrange?, Fireworks, Antoine-Laurent Lavoisier, Organic Compounds</i> DOR: <i>Gas in a Syringe, Particles in Gases, Explore Dissolving, Particles in Solids, Liquids, Gases; Hoar Frost,</i></p>

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	<p><i>Burning Sugar</i></p>
<p>7.PS.3: Energy can be transformed or transferred but is never lost. When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer. When energy is transformed from one form to another, the total amount of energy remains the same.</p>	<p>FOSS Next Generation <i>Chemical Interactions</i>: IG: Investigation 4; Parts 1-3 Investigation 5; Parts 1-2 Investigation 8; Parts 1-4 SRB: <i>Particles in Motion, Three Phases of Matter, Expansion and Contraction, Energy on the Move, Rock Solid, Heat of Fusion</i> DOR: <i>Particles in Solids, Liquids and Gases, Energy Transfer by Collision, Mixing Hot and Cold Water, Thermometer, Energy Flow, Hoar Frost</i></p> <p>Also FOSS Next Generation <i>Electromagnetic Force</i> IG: Investigation 4; Parts 1-3 SRB: <i>The Rebirth of Electric Cars, Where We Get Energy</i> DOR: <i>Generator Dissection</i></p>
<p>7.PS.4: Energy can be transferred through a variety of ways. Mechanical energy can be transferred when objects push or pull on each other over a distance.</p> <p>Mechanical and electromagnetic waves transfer energy when they interact with matter.</p> <p>Thermal energy can be transferred through radiation, convection and conduction.</p> <p>An electrical circuit transfers energy from a source to a device.</p> <p>Note: <i>Energy transfers should be experiential and observable at this grade level.</i></p>	<p>FOSS Next Generation <i>Electromagnetic Force</i> IG: Investigation 1; Parts 1-3 Investigation 2; Parts 1-3 Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 SRB: <i>The Force is With You, The Discovery of Friction, Net Force, Magnetic Force, Parts of an Incandescent Bulb, Circuitry and Lightbulbs, What is Electricity, Electromagnetism, Electromagnetic Engineering, Generator Dissection, The Rebirth of Electric Cars, Where We Get Energy</i> DOR: <i>Forces, Adding Magnetic Fields, Magnetism, Lighting a Bulb, Kitchen Magnets, Virtual Electromagnet, Generator Dissection</i></p> <p>Transfer of Thermal Energy Addressed in FOSS Next Generation <i>Weather and Water</i> IG: Investigation3; Parts 2-3 Investigation4; Parts 1-3 Investigation5; Part 1 SRB: <i>Density with Dey, Thermometer: A Device to Measure Temperature, Heating the Atmosphere, Wind on Earth</i> DOR: <i>Fluid Convection, Energy Transfer: Conduction, Radiation, Convection; Convection Chamber, Energy Transfer by Collision, Conduction through Metals</i></p> <p>Transfer of Thermal Energy also Addressed in FOSS Next Generation <i>Chemical Interactions</i> IG: Investigation 5; Parts 1-3 SRB: <i>Energy on the Move</i> DOR: <i>Energy Transfer by Collision, Mixing Hot and Cold Water, Energy Flow</i></p> <p>Mechanical and electromagnetic waves transfer energy when they interact with matter Addressed in FOSS Next Generation <i>Waves</i> IG: Investigation1; Part 1-2</p>

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	<p>Investigation2; Parts 1-3 Investigation3; Parts 1-4</p> <p>SRB: <i>Transverse and Compression Waves, Ocean Waves, Tsunamis, Sound Waves, Acoustic Engineering, Reflecting on Light, Electromagnetic Spectra, Electromagnetic Radiation and Human Health, Seismic Waves</i></p> <p>DOR: <i>Standing Wave, Big Waves, Oscilloscope, Throw a Little Light on Sight, Refraction</i></p>
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Grade 8
Life Science (LS)

Species and Reproduction

This topic focuses on continuation of the species.

State Standard	FOSS/Delta Program
<p>Species and Reproduction</p> <p>8.LS.1: Diversity of species, a result of variation of traits, occurs through the process of evolution and extinction over many generations. The fossil records provide evidence that changes have occurred in number and types of species.</p> <p>Fossils provide important evidence of how life and environmental conditions have changed.</p> <p>Changes in environmental conditions can affect how beneficial a trait will be for the survival and reproductive success of an organism or an entire species.</p> <p>Throughout Earth's history, extinction of a species has occurred when the environment changes and the individual organisms of that species do not have the traits necessary to survive and reproduce in the changed environment. Most species (approximately 99 percent) that have lived on Earth are now extinct.</p> <p>Note: Population genetics and the ability to use statistic mathematics to predict changes in a gene pool are reserved for high school Biology</p>	<p>FOSS Next Generation Heredity and Adaptation</p> <p>IG: Investigation 1; Parts 1-2 Investigation 2, Parts 1-4 Investigation 3; Parts 1-3</p> <p>SRB: <i>Fossil Dating , Mass Extinctions, An Interview with Jennifer Clack, Transitions, Tree Thinking, Understanding Heredity, A Larkey Yammer, Mendel and Punnett Squares, Mapping the Human Genome, Adaptation, Natural Selection, What Makes a Scientific Theory, Influencing Evolution</i></p> <p>DOR: <i>Biodiversity slide show, Fossils slide show, Fish with Fingers, Great Transitions: The Origin of Tetrapods, A Model for Predicting Genetic Variation, larkey Impossible Traits, Larkey Punnett Square, Heredity, Walking Sticks: Eat Insects, Walking Sticks: Find Insects in Three Environments, Larkey Natural Selection, The Making of the Fittest: Natural Selection and Adaptation, The Origin of Species: The Beak of the Finch,</i></p>
<p>8.LS.2: Every organism alive today comes from a long line of ancestors who reproduced successfully every generation.</p> <p>Reproduction is the transfer of genetic information from one generation to the next. It can occur with mixing of genes from two individuals (sexual reproduction). It can occur with the transfer of genes from one individual to the next generation (asexual reproduction). The ability to reproduce defines living things.</p>	<p>FOSS Next Generation Heredity and Adaptation</p> <p>IG: Investigation 1; Parts 1-2 Investigation 2, Parts 1-4 Investigation 3; Parts 1-3</p> <p>SRB: <i>Fossil Dating , Mass Extinctions, An Interview with Jennifer Clack, Transitions, Tree Thinking, Understanding Heredity, A Larkey Yammer, Mendel and Punnett Squares, Mapping the Human Genome, Adaptation, Natural Selection, What Makes a Scientific Theory, Influencing Evolution</i></p> <p>DOR: <i>Biodiversity slide show, Fossils slide show, Fish with Fingers, Great Transitions: The Origin of Tetrapods, A Model for Predicting Genetic Variation, Larkey Impossible Traits, Larkey Punnett Square, Heredity, Walking Sticks: Eat Insects, Walking Sticks: Find Insects in Three Environments, Larkey Natural Selection, The Making of the Fittest: Natural Selection and Adaptation, The Origin of Species: The Beak of the Finch</i></p>
<p>8.LS.3: The characteristics of an organism are a result of inherited traits received from parent(s).</p> <p>Expression of all traits is determined by genes and environmental factors to varying degrees. Many genes influence more than one trait, and many traits are influenced by more than one gene.</p>	<p>FOSS Next Generation Heredity and Adaptation</p> <p>IG: Investigation 2, Parts 1-4</p> <p>SRB: <i>Tree Thinking, Understanding Heredity, A Larkey Yammer, Mendel and Punnett Squares, Mapping the Human Genome, Adaptation, Natural Selection, What Makes a Scientific Theory</i></p> <p>DOR: <i>, A Model for Predicting Genetic Variation, Larkey Impossible Traits, Larkey Punnett Square, Heredity,</i></p>

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Grade 8

<p>During reproduction, genetic information (DNA) is transmitted between parent and offspring. In asexual reproduction, the lone parent contributes DNA to the offspring. In sexual reproduction, both parents contribute DNA to the offspring.</p> <p>Note 1: <i>The focus should be the link between DNA and traits without being explicit about the mechanisms involved.</i></p> <p>Note 2: <i>The ways in which bacteria reproduce is beyond the scope of this content statement.</i></p> <p>Note 3: <i>The molecular structure of DNA is not appropriate at this grade level.</i></p>	
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Earth and Space Science (ESS)

Physical Earth

This topic focuses on the physical features of Earth and how they formed. This includes the interior of Earth, the rock record, plate tectonics and landforms.

State Standard	FOSS/Delta Program
Physical Earth	
<p>8.ESS.1: The composition and properties of Earth’s interior are identified by the behavior of seismic waves. The refraction and reflection of seismic waves as they move through one type of material to another is used to differentiate the layers of Earth’s interior. Earth has a core, a mantle, and a crust. Impacts during planetary formation generated heat.</p> <p>These impacts converted gravitational potential energy to heat. Earth’s core is also able to generate its own thermal energy because of decaying atoms. This continuously releases thermal energy. Thermal energy generated from Earth’s core drives convection currents in the asthenosphere.</p> <p>Note 1: <i>Radioactive decay is not the focus; this will be discussed in Physical Science and Chemistry.</i></p> <p>Note 2: <i>At this grade level, analyzing seismograms (e.g., amplitude and lag time) and reading a travel time curve are not the focus. At this grade the properties of seismic waves should be addressed.</i></p>	<p>FOSS Next Generation Earth History IG: Investigation 5; Parts 1 Investigation 6; Parts 1-3 SRB: <i>Historical Databases about a Dynamic Earth, The History of the Theory of Plate Tectonics</i> DOR: <i>Pacific Northwest Tour, Earth’s Interior slide show, Wegener, Earthquakes Around the World, NOAA Plate Tectonics, Convection, Plate Boundaries Map</i></p>
<p>8.ESS.2: Earth’s lithosphere consists of major and minor tectonic plates that move relative to each other. Historical data and observations such as fossil distribution, paleomagnetism, continental drift and sea-floor spreading contributed to the theory of plate tectonics. The rigid tectonic plates move with the molten rock and magma beneath them in the upper mantle.</p> <p>Convection currents in the asthenosphere cause movements of the lithospheric plates. The energy that forms convection currents comes from deep within the Earth.</p>	<p>FOSS Next Generation Earth History IG: Investigation 6; Parts 1-3 Investigation 7; Parts 1-2 SRB: <i>Volcanoes, The History of the Theory of Plate Tectonics, Historical Databases about a Dynamic Earth, Earth’s Dynamic System</i> DOR: <i>Longitude and Latitude, Volcano Plotting Activity, Volcanoes around the World, Volcanoes Formation, Earthquake Plotting Activity, Mount St. Helens: The Eruption Impact, Wegener, Earthquakes Around the World, NOAA Plate Tectonics, Convection, Plate Boundaries Map,</i></p>

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Grade 8

<p>There are three main types of plate boundaries: divergent, convergent and transform. Each type of boundary results in specific motion and causes events (such as earthquakes or volcanic activity) or features (such as mountains or trenches) that are indicative of the type of boundary.</p>	<p><i>Convergent Boundary, Divergent Boundary, Transform Boundary, Folding, Mountain Types</i></p>
<p>8.ESS.3: A combination of constructive and destructive geologic processes formed Earth's surface. Earth's surface is formed from a variety of different geologic processes, including but not limited to plate tectonics.</p>	<p>FOSS Next Generation Earth History IG: Investigation 1; Parts 1-3 Investigation 2; Parts 1-3 Investigation 3; Parts 1-3 investigation 5; Parts 1-3 Investigation 6; Parts 1-3 Investigation 7; Parts 1-2 Investigation 8; Parts 1-3 Investigation 9; Parts 1-2 SRB: <i>Seeing Earth, Powell's Grand Canyon Expedition: 1869, Grand Canyon Flood, Weathering and Erosion, Soil Stories, Where in the World is Calcium Carbonate, Water on Mars?, Historical Debates about a Dynamic Earth, The History of the Theory of Plate Tectonics, Earth's Dynamic Systems, Rock Transformations, How One Rock Became Another Rock, Geoscenario Introduction: Glaciers, Geoscenario Introduction: Coal, Geoscenario Introduction: Yellowstone Hotspt, Geoscenario Introduction: Oil, Research Careers in the Lab and Field</i> DOR: <i>Landforms Tour, Scale Model, Grand Canyon Flyover, Powell's River Trip, Grand Canyon Rocks Correlation, Stream Table: High Flow & Low Flow, Stream Table: High Slope and Low Slope, Stream Table: Homogeneous v. Heterogeneous, Grand Canyon Flood, Glen Canyon Dam High Flood Experiment, Debris Flow, Freezing Glass Bottle, Frost Wedging, Rock Fall, Weathering and Erosion, Sandstone Formation, Shale Formation, Zion National Park Expedition, Limestone Formation, Rock Column Movie Maker, Rock Database, Sedimentary Rocks tour, Pacific Northwest Tour, Extrusive Rock Formation, Intrusive Rock Formation, Yosemite National Park Field Trip, Hawaii Field Trip, Longitude and Latitude, Volcano Plotting Activity, Volcanoes around the World, Volcanoes Formation, Earthquake Plotting Activity, Mount St. Helens: The Eruption Impact, Wegener, Earthquakes Around the World, NOAA Plate Tectonics, Convection, Plate Boundaries Map, Convergent Boundary, Divergent Boundary, Transform Boundary, Folding, Mountain Types, Introduction to Geoscenarios, Geoscenario Resources, Timeliner, Grand Canyon Revisited, Colorado Plateau Over Time, Fearless Planet</i></p>
<p>8.ESS.4: Evidence of the dynamic changes of Earth's surface through time is found in the geologic record. Earth is approximately 4.6 billion years old. Earth history is based on observations of the geologic record and the understanding that processes observed at present day are similar to those that occurred in the past (uniformitarianism). There are different methods to determine relative and absolute age of some rock layers in the geologic record. Within a sequence of undisturbed sedimentary rocks, the oldest rocks are</p>	<p>FOSS Next Generation Earth History IG: Investigation 1; Parts 1-3 Investigation 2; Parts 2-3 Investigation 3; Parts 1-3 Investigation 4; Parts 1-3 investigation 8; Parts 1-2 Investigation 9; Parts 1-2 SRB: <i>Seeing Earth, Powell's Grand Canyon Expedition: 1869, Grand Canyon Flood, Weathering and Erosion, Soil Stories, Where in the World is Calcium Carbonate, Water on Mars?, A Fossil Primer, Rocks, Fossils and Time, ,</i></p>

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Grade 8

<p>at the bottom (superposition). The geologic record can help identify past environmental and climate conditions.</p>	<p><i>Geoscenario Introduction: Glaciers, Geoscenario Introduction: Coal, Geoscenario Introduction: Yellowstone Hotspt, Geoscenario Introduction: Oil, Research Careers in the Lab and Field</i> DOR: <i>Landforms Tour, Scale Model, Grand Canyon Flyover, Powell's River Trip, Grand Canyon Rocks Correlaiton, Stream Table: High Flow & Low Flow, Stream Table: High Slope and Low Slope, Stream Table: Homogeneous v. Heterogeneous, Grand Canyon Flood, Glen Canyon Dam High Flood Experiment, Debris Flow, Freezing Glass Bottle, Frost Wedging, Rock Fall, Weathering and Erosion, Sandstone Formation, Shale Formation, Zion National Park Expedition, Limestone Formation, Rock Column Movie Maker, Rock Database, Sedimentary Rocks tour, Timeliner, Index Fossil Correlation, Dating Rock Layers, Introduciton to Geoscenarios, Geoscenario Resources, Grand Canyon Revisited, Colorado Plateau Over Time, Fearless Planet</i></p>
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Physical Science (PS)

Forces and Motion

This topic focuses on forces and motion within, on and around the Earth and within the universe.

State Standard	FOSS/Delta Program
<p>Forces and Motion</p> <p>8.PS.1: Objects can experience a force due to an external field such as magnetic, electrostatic, or gravitational fields.</p> <p>Magnetic, electrical and gravitational forces can act at a distance.</p>	<p>FOSS Next Generation: Gravity and Kinetic Energy IG: Investigation 1; Parts 1-3 Investigation 2; Parts 1-2 SRB: <i>Gravity: It's the Law A Weighty Matter, Gravity in Space</i> DOR: <i>Falling Ball Analysis Slide Show, Falling Ball, Heavy and Light Balls, Hammer and Feather in Space</i></p> <p>Note: Magnetic Force addressed in Grade 7</p> <p>FOSS Next Generation Electromagnetic Force IG: Investigation 2; Parts 1-3 SRB: <i>Magnetic Force</i> DOR: <i>Adding Magnetic Fields, Magnetism</i></p>
<p>8.PS.2: Forces can act to change the motion of objects. The motion of an object is always measured with respect to a reference point.</p> <p>Forces can be added. The new force on an object is the sum of all of the forces acting on the object.</p> <p>If there is a nonzero net force acting on an object, its speed and/or direction will change.</p> <p>Kinetic friction and drag are forces that act in a direction opposite the relative motion of objects.</p>	<p>FOSS Next Generation Gravity and Kinetic Energy IG: Investigation 1; Parts 1-3 Investigation 2; Parts 1-2 Investigation 3; Parts 1-4 Investigation 4; Parts 1-3 SRB: <i>How Fast Do Things Go?, Faster and Faster Gravity: It's the Law, A Weighty Matter, Gravity in Space, Potential and Kinetic Energy, Avoiding Collisions, Newton's Laws, Collisions and Concussions,</i> DOR: <i>Movie Tracker, Movie Tracker and Data, Falling Ball Analysis Slide Show, Falling Ball, heavy and Light Balls, Hammer and Feather in Space, Understanding Car Crashes</i></p>