Grade Kindergarten
Physical Science

Students explore how their senses can detect light, sound, and vibration and how technology can be used to extend their senses.

State Standard	FOSS Program
K.P2U1.1 Investigate how senses can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation.	**FOSS *Next Generation Trees and Weather*** **TE:** Investigation 1; Part 1 Investigation 2; Part 1 Investigation 3 Part 2 **SE:** *How do we learn?*
K.P2U2.2 Design and evaluate a tool that helps people extend their senses.	**FOSS Next Generation Trees and Weather** **TE:** Investigation 3; Part 2, 3 **SE:** *Up in the Sky; Weather*

Earth and Space Science

Students develop an understanding of patterns to understand changes in local weather, seasonal cycles, and daylight.

State Standard	FOSS Program
K.E1U1.3 Observe, record, and ask questions about temperature, precipitation, and other weather data to identify patterns or changes in local weather.	**FOSS Next Generation Trees and Weather** **TE:** Investigation 3; Parts 1-3 **SE:** *Up in the Sky; Weather* **DR:** Comes a Tide
K.E1U1,4 Observe, describe, ask questions, and predict seasonal weather patterns; and how those patterns impact plants and animals (including humans).	**FOSS Next Generation Trees and Weather** **TE:** Investigation 4; All Parts **SE:** *My Apple Tree; Orange Trees; Our Very Own Tree; Maple Trees* **DR:** Who Lives Here?; Once There Was a Tree; Summer
K.E2U1.5 Observe and ask questions about patterns of the motion of the sun, moon, and stars in the sky.	**FOSS Next Generation Trees and Weather** **TE:** Investigation 3; Part 1 **SE:** *Up in the Sky*

Life Science

Students develop an understanding that the world is comprised of living and non-living things. They investigate the relationship between structure and function in living things; plants and animals use specialized parts to help them meet their needs and survive.

State Standard	FOSS Program
K.L1U1.6 Obtain, evaluate, and communicate information about how organisms use different body parts for survival.	**FOSS Next Generation Animals 2 x 2** **TE:** Investigation 1; Parts 1, 4, 5 Investigation 2 Part 1; Investigation 3; Parts 1, 3 Investigation 4 Parts 1, 2 **SE:** *Fish Same and Different; Fish live in different places; Birds outdoors; Worms in Soil; Isopods*

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

Grade Kindergarten

	FOSS Next Generation Trees and Weather **TE:** Investigation 1: Part 1 Investigation 4 Part 7 ,9 **SE:** *Maple Trees* **DR:** Summer
K.L1U1.7 Observe, ask questions, and explain how specialized structures found on a variety of plants and animals (including humans) help them sense and respond to their environment..	**FOSS Next Generation Animals 2 x 2** **TE:** Investigation 2: Part 3 **SE:** *Water and Land Snails*
K.L2U1.8 Observe, ask questions, and explain the differences between the characteristics of living and non-living things.	**FOSS Next Generation Trees and Weather** **TE:** Investigation 1: Parts 5, 6 **SE:** *Where do trees go? What do plants need?* **Trade Book:** A Tree Comes to Class **FOSS Animals 2 x 2** **TE:** *Investigation 4: Part 4* **SE:** *Living and Nonliving* **Trade Book** *Animals 2 x 2* **DR:** Find the Parent

STEM Engineering

Engineering is a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants. This includes defining and delimiting an engineering problem, developing possible solutions and optimizing the design solution. *(A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. (2012). Washington: The National Academies Press. p. 202-203).*

State Standard	FOSS Program
Core Idea U2 The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.	**FOSS Next Generation Materials and Motion** **TE:** Investigation 1, Parts 1,6, 7 Investigation 2, Parts 2,4, 5 Investigation 3, Part 6 Investigation 4, Part 2 **SE:** *Are you an Engineer? The Story of a Chair; The Story of a Box* **DR:** Roller Coaster Builder **FOSS Next Generation Trees and Weather** **TE:** Investigation 3, Part 3 **SE:** *Weather* **DR:** Come a Tide

Grade 1

Physical Science

Students develop an understanding of the effects of forces and waves, and how they can impact or be impacted by objects near and far away. They explore the relationships between sound and vibrating materials, as well as, light and materials including the ability of sound and light to travel from place to place.

State Standard	FOSS Program
1.P2U1.1 Plan and carry out investigations demonstrating the effect of placing objects made with different materials in the path of a beam of light and **predict** how objects with similar properties will affect the beam of light.	**FOSS Next Generation Sound and Light** **TE:** Investigation 3; All Parts Investigation 4; All Parts **SE:** *Playing in the Light; Reflections, Seeing the Light* **DR:** All about Light; Light and Shadows; My Shadow
1.P2U1.2 Use models to provide evidence that vibrating matter creates sound and sound can make matter vibrate.	**FOSS Next Generation Sound and Light** **TE:** Investigation 1; All Parts Investigation 2; All Parts **SE:** *Vibration and Sound; Listen to This; Animal Ears and Hearing; Listen to This* **DR:** Sorting Sounds; Sorting Cards
1.P3U1.3 Plan and carry out investigations which demonstrate how equal forces can balance objects and how unequal forces can push, pull, twist objects, making them change their speed, direction, or shape.	**FOSS Next Generation STEM Forces in Action** **TE:** Investigations 1, 2, 3 and 4, All Parts **SE:** *Push or Pull, Things that Spin,Rolling, Rolling, Rolling! Move It, but Don't Touch It, Make It Balance* **DR:** Roller Coaster Builder; All about Simple Machines
1.P4U2.4 Design and evaluate ways to increase or reduce heat from friction between two objects.	**FOSS Next Generation STEM Forces in Action** **TE:** Investigation 1, Part 1 Investigation 3, Part 1

Earth and Space Science

Students develop an understanding that organisms depend on earth materials and other organisms for survival.

State Standard	FOSS Program
1.E1U1.5 Obtain, evaluate, and communicate information about the properties of Earth materials and investigate the properties of earth materials and how humans use resources in everyday life.	**FOSS Next Generation Insects and Plants** **TE:** Investigation 1, Parts 1-2 Investigation 3, Part 2 Investigation 5, Part 4 **SE:** *Animals and Plants in Their Habitats* **DR:** Habitat Havoc, What is Pollination *Note: This will be extended in Grade 2 Pebbles, Sand and Silt Investigation 3.*

Life Science

Students develop an understanding that the Earth has supported, and continues to support, a large variety of organisms. These organisms can be distinguished by their physical characteristics, life cycles, and their different resource needs for survival. Different types of organisms live where there are different earth resources such as food, air and water.

Grade 1

State Standard	FOSS Program
1.L1U1.6 Observe, describe, and predict life cycles of animals and plants	**FOSS Next Generation Insects and** Plants **TE:** Investigations 1-5, All Parts **SE:** *Flowers and Seeds; Insect Life Cycles* **DR:** How Seeds get here and there?
1.L2U2.7 Develop and use models about how living things use resources to grow and survive; design and evaluate habitats for organisms using earth materials**.**	**FOSS Next Generation Insects and Plants** **TE:** Investigation 3, Part 3 Investigation 4, Part 2 **SE:** *Animals and Plants in their Habitats;* **DR:** Habitat Gallery; Where Does It Live; Organisms Match; Habitat Havoc
1.L2U1.8 Construct an explanation describing how organisms obtain resources from the environment including materials that are used again by other organisms.	**FOSS Next Generation Insects and Plants** **TE:** Investigations 1-5; All Parts **SE:** *Animals and Plants in their Habitats; So Many Kinds, So Many Places* **DR:** What Doesn't Belong
1.L3U1.9 Obtain, evaluate, and communicate information to support an evidence-based explanation that plants and animals produce offspring of the same kind, but offspring are generally not identical to each other or their parents	**FOSS Next Generation Insects and Plants** **TE:** Investigation 1, Part 3 Investigation 5, Part 3 **SE:** *Insects Shapes and Colors*; *So Many Kinds, So Many Places* **DR:** Live Goes Around
1.L4U1.10 Develop a model to describe how animals and plants are classified into groups and subgroups according to their similarities.	**FOSS Next Generation Insects and Plants** **TE:** Investigation 3, Part 2, 4 Investigation 4, Part 2 Investigation 5, Part 3 **SE:** *Insects Shapes and Colors*; *So Many Kinds, So Many Places* **DR:** Insects; Insect Hunt; House and Backyard, Insects; Watch it Grow, What Doesn't Belong
1.L4U3.11 Ask questions and explain how factors can cause species to go extinct.	**FOSS Next Generation Insects and Plants** **TE:** Investigation 1, Part 3; Steps 7 and 13 Investigation 3, Part 2; Steps 17-18 Investigation 4, Part 4 **DR:** Habitat Havoc *Note: This can be extended with online tutorials from grade 3 FOSS Next Generation Structures of Life Grade 3 Tutorials: Basic Plant Needs; Basic Animal Needs.*

Grade 1
STEM Engineering

Engineering is a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants. This includes defining and delimiting an engineering problem, developing possible solutions and optimizing the design solution *(A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. (2012). Washington: The National Academies Press. p. 202-203).*

State Standard	FOSS Program
Core Idea U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.	**FOSS Next Generation Sound and Light** **TE:** Investigation 2, Part 4 Investigation 4, Part 4 **SE:** *Communicating with Light* **FOSS Next Generation Insects and Plants** **TE:** Investigation 4, Part 2 Investigation 5, Part 2 **FOSS Next Generation STEM Forces in Action** **TE:** Investigation 1, Part 1 Investigation 3, Part 3 Investigation 4, Part 3

Grade 2
Physical Science

Students develop an understanding of observable properties of matter and how changes in energy (heating or cooling) can affect materials.

State Standard	FOSS Program
2.P1U1.1 Plan and carry out an investigation to determine that matter has mass, takes up space, and is recognized by its observable properties; use the collected evidence to develop and support an explanation.	**FOSS Next Generation Solids and Liquids** **TE:** Investigation 1, Parts 1-4 Investigation 2 and 3, all Parts; Investigation 4, Parts 1-3 **SE:** *Everything Matters, Solid Objects and Materials, Towers, Bridges, Liquids, Pouring, Mix It Up!* **DR:** Clothing and Building Materials, Properties of Materials, All About Properties of Matter, Falling Bottle Puzzle, Comparing Solids and Liquids **FOSS Next Generation Air and Weather** **TE:** Investigation 1, All Parts **SE:** *Air is There; What is All Around Us* **DR:** Friction and Air Resistance
2.P1U1.2 Plan and carry out investigations to gather evidence to support an explanation on how heating or cooling can cause a phase change in matter.	**FOSS Next Generation Solids and Liquids** **TE:** Investigation 4, Part 3 **SE:** *Heating and Cooling, Is Change Reversible?* **DR:** Solids and Liquids, Change It!
2.P4U1.3 Obtain, evaluate and communicate information about ways heat energy can cause change in objects or materials.	**FOSS Next Generation Solids and Liquids** **TE:** Investigation 4, Part 3 **SE:** *Heating and Cooling, Is Change Reversible?* **DR:** Solids and Liquids, Change It!

Earth and Space Science

Students develop an understanding of the distribution and role of water and wind in weather, shaping the land, and where organisms live. Wind and water can also change environments, and students learn humans and other organisms can change environments too. Students develop an understanding of changing patterns in the sky including the position of Sun, Moon, and stars, and the apparent shape of the Moon.

State Standard	FOSS Program
2.E1U1.4 Observe and investigate how wind and water change the shape of the land resulting in a variety of landforms.	**FOSS Next Generation Pebbles, Sand, and Silt** **TE:** Investigation 1, Part 2 Investigation 2, Parts 2 and 4 Investigation 4, Parts 2 and 4 **SE:** *The Story of Sand, Rocks Move, Landforms, Where is Water Found?. What is in Soil?, Testing Soil. Erosion, Ways to Represent Land and Water* **DR:** All About Volcanoes, All about Soil, All about Landforms **FOSS Next Generation Air and Weather** **TE:** Investigation 3, All Parts **SE:** *Understanding Weather* **DR:** Wind Speed

Grade 2

2.E1U1.5 Develop and use models to represent that water can exist in different states and is found in oceans, glaciers, lakes, rivers, ponds, and the atmosphere.	**FOSS Next Generation Pebbles, Sand, and Silt** **TE:** Investigation 4, Part 3 and 4 **SE:** *Where is Water Found?, States of Water, Ways to Represent Land and Water*
2.E1U2.6 Analyze patterns in weather conditions of various regions of the world and design, test, and refine solutions to protect humans from severe weather conditions.	**FOSS Next Generation Pebbles, Sand, and Silt** **TE:** *Investigation 4, Part 4* **SE:** *Erosion* **DR:** *All About Landforms* **FOSS Next Generation Air and Weather** **TE:** Investigation 2, Parts 1-3 Investigation 3, Parts 1-3 Investigation 4, Parts 1 and 3 **SE:** *What is all Around Us?, What is the Weather Today?, Clouds, Water in the Air, Understanding the Weather, Seasons, Getting through the Winter* **DR:** Cloud Catcher, Wind Speed, What's the Weather?
2.E1U3.7 Construct an argument from evidence regarding positive and negative changes in water and land systems that impact humans and the environment.	**FOSS Next Generation Pebbles, Sand, and Silt** **TE:** Investigation 4, Part 2 **SE:** *What is in the Soil?, Testing Soil, Where is Water Found?, States of Water, Erosion* **DR:** *All About Soil, All about Landforms*
2.E2U1.8 Observe and explain the Sun's position at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another.	**FOSS Next Generation Air and Weather** **TE:** Investigation 2, Part 4 Investigation 4, Part 1 and 2 **SE:** *Changes in the Sky*

Life Science

Students develop an understanding that life on Earth depends on energy from the Sun or energy from other organisms to survive.

State Standard	FOSS Program
2.L2U1.9 Obtain, analyze, and communicate evidence that organisms need a source of energy, air, water, and certain temperature conditions to survive.	**FOSS Next Generation Plants and Animals** **TE:** Investigations 1, 2, 3, and 4, All Parts **SE:** *What Do Plants Need?, The Story of Wheat, Variation, What Do Animals Need?, Plants and Animals Around the World, Learning from Nature, Animals and Their Young* **DR:** How Plants Grow, Animal Growth, How Plants Live in Different Places, Animal Growth, Sorting Animals by Structures, Habitat Sort, Animal Offspring and Caring for Animals, Watch it Grow!, Find the Parent
2.L2U1.10 Develop a model representing how life on Earth depends on energy from the Sun and energy from other organisms.	**FOSS Next Generation Plants and Animals** **TE:** Investigation 1, All Parts Investigation 3, All Parts **SE:** *What Do Plants Need?, The Story of Wheat, Variation, What Do Animals Need?, Plants and Animals Around the World, Learning from Nature* **DR:** How Plants Grow, Animal Growth, How Plants Live in Different Places, Animal Growth, Sorting Animals by Structures, Habitat Sort

Grade 2
STEM Engineering

Engineering is a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants. This includes defining and delimiting an engineering problem, developing possible solutions and optimizing the design solution. *(A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. (2012). Washington: The National Academies Press. p. 202-203).*

Core Idea for Using Science State Standard	FOSS Program
Core Idea U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products. .	**FOSS Next Generation Air and Weather** **TE:** Investigation 1, Part 2 **SE:** *What is All Around Us?* **DR:** Friction and Air Resistance **FOSS Next Generation Pebbles, Sand, and Silt** **TE:** Investigation 2, Part 1 Investigation 3, Part 3 Investigation 4, Part 4 **FOSS Next Generation Solids and Liquids** **TE:** Investigation 1, Part 4

Grade 3
Physical Science

Students develop an understanding of the sources, properties, and characteristics of energy along with the relationship between energy transfer and the human body.

State Standard	FOSS Program
3.P2U1.1 Ask questions and investigate the relationship between light, objects, and the human eye.	
3.P1U1.2 Plan and carry out an investigation to explore how sound waves affect objects at varying distances.	**FOSS Next Generation STEM Sound Design** **TE:** Investigation 3, Parts 1, 2 and 3 **SE:** *Moving Along in Compression Waves, Bouncing Back, Sound in the Ocean* **DR:** *Real World Science: Sound* (video)
3.P4U1.3 Develop and use models to describe how light and sound waves transfer energy.	**FOSS Next Generation STEM Sound Design** **TE:** Investigation 2, Part 1 Investigation 3, Part 3 **SE:** *Scoping Out Sound, Moving Along in Compression Waves* **DR:** *Real World Science: Sound* (video)

Earth and Space Science.

Students develop an understanding of how the Sun provides light and energy for Earth systems.

State Standard	FOSS Program
3.E1U1.4 Construct an explanation describing how the Sun is the primary source of energy impacting Earth systems.	**FOSS Next Generation Structures of Life** **TE:** Investigation 2, Parts 1-2 Investigation 3, Part 1 **SE:** *Germination, Life Cycles, Life on Earth, A Change in the Environment* **DR:** How Plants Get Food, All About Animal Life Cycles, Structure and Function of Plants, Habitat Gallery, Organisms Match

Grade 3

Life Science

Students develop an understanding of the flow of energy in a system beginning with the Sun to and among organisms They also understand that plants and animals (including humans) have specialized internal and external structures and can respond to stimuli to increase survival.

State Standard	FOSS Program
3.L1U1.5 Develop and use models to explain that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.	**FOSS Next Generation Structures of Life** **TE:** Investigations 1, 2, 3, and 4, All Parts **SE:** *The Reason for Fruit, The Most Important Seed, Nature Journal-How Seeds Travel, Germination, Life Cycles, Adaptations, A Change in the Environment, The Human Skeleton, Skeletons on the Outside Crayfish Snails and Humans, Your Amazing Opposable Thumbs, Joints and Muscles* **DR:** How Seeds Get Here and There, Plants' Basic Needs How Plants Get Food, All About Animal Life Cycles, Structure and Function of Plants, All About Animal Adaptations, Animals' Basic Needs, Crayfish vs Snail vs Mantis, Habitat Gallery, All about Fossils, Mr. Bones
3.L2U1.6 Plan and carry out investigations to demonstrate ways plants and animals react to stimuli.	**FOSS Next Generation Structures of Life** **TE:** Investigation 1, All Parts Investigation 3, All Parts **SE:** *The Reason for Fruit, Crayfish, Adaptations, Life on Earth, A Change in Environment, Food Chains* **DR:** How Seeds Get Here and There, Plants' Basic Needs, All about Animal Adaptations, All about Animal Behavior and Communication, Animals' Basic Needs, Walking Stick Survival, Life Cycles
3.L2U1.7 Develop and use system models to describe the flow of energy from the sun to and among living organisms.	**FOSS Next Generation Structures of Life** **TE:** Investigation 2, Parts 1-2 Investigation 3, All Parts **SE:** *Germination, Life Cycles, Life on Earth, A Change in the Environment,* **DR:** How Plants Get Food, All About Animal Life Cycles, Structure and Function of Plants, Habitat Gallery, Organisms Match
3.L2U1.8 Construct an argument from evidence that organisms are interdependent.	**FOSS Next Generation Structures of Life** **TE:** Investigation 3, Parts 3 and 5 **SE:** *Crayfish, Adaptations, Life on Earth, A Change in Environment, Food Chains* **DR:** All about Animal Adaptations, All about Animal Behavior and Communication, Animals' Basic Needs, Walking Stick Survival, Life Cycles, Where Does it Live? What Doesn't Belong?, Habitat Gallery

Grade 3

STEM Engineering

Engineering is a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants. This includes defining and delimiting an engineering problem, developing possible solutions and optimizing the design solution *(A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. (2012). Washington: The National Academies Press. p. 202-203).*

State Standard	FOSS Program
Core Idea U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.	**FOSS Next Generation STEM Sound Design** **TE:** Investigation 2, Part 3 **SE:** *Lights, Camera, Action*

Grade 4

Physical Science

Students develop an understanding of how Earth's resources can be transformed into different forms of energy. Students develop a better understanding of electricity and magnetism.

State Standard	FOSS Program
4.P4U1.1 Develop and use a model to demonstrate how a system transfers energy from one object to another even when the objects are not touching.	**FOSS Next Generation Energy** **TE:** Investigations 1-5, all Parts **SE:** *Edison Sees the Light, Energy Sources, Series and Parallel Circuits, Engineering a Solar Lighting System, When Magnet Meets Magnet, Magnificent Magnetic Models, Make a Magnetic Compass, Electricity Creates magnetism, Using Magnetic Fields, Morse Gets Clicking, Energy, Force and Energy, Waves, Light Interactions* **DR:** Lighting a Bulb, Flow of Electricity, Simple Circuits, Conductors and Insulators, Turn on the Switch, All About Magnets, Magnetic Poles Quiz, Virtual Electromagnets, All about the Transfer of Energy, Sound Energy, Real World Science: Sound, Virtual Investigations 3.2; Online Tutorials Inv 1, 2, 3, 5
4.P4U1.2 Develop and use a model that explains how energy is moved from place to place through electric currents.	**FOSS Next Generation Energy** **TE:** Investigation 1, all Parts Investigation 3, all Parts Investigation 4, Part 1 **SE:** *Edison Sees the Light, Energy Sources, Series and Parallel Circuits, Engineering a Solar Lighting System, electricity Creates Magnetism, Using Magnetic Fields, Electromagnets Everywhere, Morse Gets Clicking, Systems and Energy* **DR:** Lighting a Bulb, Flow of Electricity, Simple Circuits, Conductors and Insulators Turn on the Switch, Kitchen Magnets, Virtual Electromagnet, Energy, Online Tutorials Inv 1, 4
4.P2U11.3 Develop and use a model to demonstrate magnetic forces.	**FOSS Next Generation Energy** **TE:** Investigation 2, all Parts Investigation 3, all Parts **SE:** *When Magnet Meets Magnet, Magnificent magnetic Models, Make a Magnetic Compass, Electricity Creates magnetism, Using Magnetic Fields, Electromagnets Everywhere, Morse Gets Clicking* **DR:** What Sticks and What Conducts? Magnetic Poles, Magnetic Poles Quiz, Kitchen Magnets, Virtual Electromagnet, Virtual Investigations 2.1; Online Tutorials Inv 2, 3
4P4U3.4 Engage in argument from evidence on the use and impact of renewable and nonrenewable resources to generate electricity.	**FOSS Next Generation Energy** **TE:** Investigation 4, Part 1 Investigation 5, Part 3 **SE:** *Energy, Alternative Sources of Electricity, Mr. Osgood's Class Report* **FOSS Next Generation Water and Climate** **TE:** Investigation 5, Part 3 **SE:** *Using the Energy of Water* **FOSS Next Generation Soils, Rocks, and Landforms** **TE:** Investigation 4, all Parts

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

	SE: *Monumental Rocks, Geoscientists at Work, Making Concrete, Earth Materials in Art* **DR:** Natural Resources, Virtual Investigation: Natural Resources

Earth and Space Science

Students develop an understanding of the different Earth systems and how they interact with each other. They understand how geological systems change and shape Earth and the evidence that is used to understand these changes. They also understand how weather, climate, and human interactions can impact the environment.

State Standard	FOSS Program
4.E1U1.5 Use models to explain seismic waves and their effect on the Earth.	**FOSS Next Generation Soils, Rocks, and Landforms** **TE:** Investigation 3, Part 4 **SE:** *It Happened So Fast!* **DR:** All About Earthquakes **FOSS Next Generation Energy** **TE:** Investigation 5, Parts 1 and 3 **SE:** *Waves* **DR:** Wave, All About Waves
4.E1U1.6 Plan and carry out an investigation to explore and explain the interactions between Earth's major systems and the impact on Earth's surface materials and processes.	**FOSS Next Generation Water and Climate** **TE:** Investigation 3, all Parts Investigation 4, all Parts **SE:** *Studying Weather, Drying Up, Surface-Area Experiment, Condensation, The Water Cycle, Climate Regions, Wetlands Flood Control, Conserving Water during Droughts* **DR:** All About Meteorology, Weather Grapher, Evaporation Experiment, Water Cycle, All About Climate and Seasons, Climate-Regions Map, Come a Tide, Floods, Tutorials Inv 3. **FOSS Next Generation Soils, Rocks, and Landforms** **TE:** Investigation 1, all Parts Investigation 2, all Parts Investigation 3, Parts 2-4 **SE:** *What is Soil?, Weathering, Erosion and Deposition, Landform Photo Album, Fossils Tell a Story, Pieces of a Dinosaur Puzzle, The Story of Mt. Shasta, It Happened So Fast!* **DR:** Weathering and Erosion, Soils, Weathering, Water Retention of Soils, Weathering and Erosion, Stream Tables: Slopes and Floods, Fossils, Soil Formation, Volcanoes, Topographer, Mt. St. Helens Impact, All About Earthquakes, Tutorials Inv 1, 2, Virtual Inv 1, 2
4.E1U1.7 Develop and/or revise a model using various rock types, fossil location, and landforms to show evidence that Earth's surface has changed over time.	**FOSS Next Generation Soils, Rocks, and Landforms** **TE:** Investigation 2, all Parts Investigation 3, all Parts **SE:** *Erosion and Deposition, Landform Photo Album, Fossils Tell a Story, Pieces of a Dinosaur Puzzle, Topographic Maps, The Story of Mt. Shasta, It Happened So Fast!*

Grade 4

	DR: Weathering and Erosion, Stream Tables: Slopes and Floods, Fossils, Soil Formation, Volcanoes, Topographer, Mt. St. Helens Impact, All About Earthquakes, Tutorials Investigations 1, 2. Virtual Investigations 1 and 2.3
4.E1U1.8 Collect, analyze, and interpret data to explain weather and climate patterns.	**FOSS Next Generation Water and Climate** **TE:** Investigation 2, all Parts Investigation 3, all Parts Investigation 4, all Parts **SE:** *Vacation Aggravation, Celsius and Fahrenheit, Water: Hot and Cold, Studying Weather, Drying Up, Surface-Area Experiment, Condensation, The Water Cycle, Climate Regions, Wetlands Flood Control, Conserving Water during Droughts* **DR:** Measuring Temperature, Bottle Thermometer, Hot and Cold-Water Density, All About Meteorology, Weather Grapher, Evaporation Experiment, Water Cycle, All About Climate and Seasons, Climate-Regions Map, Come a Tide, Floods, Tutorial Inv 3
4.E1U3.9 Construct and support an evidence-based argument about the availability of water and its impact on life.	**FOSS Next Generation Water and Climate** **TE:** Investigation 1, Parts 1, 2 and 4 Investigation 2, Parts 4 and 5 Investigation 4, all Parts **SE:** *A Report from the Blue Planet, Opinion and Evidence, Water Everywhere, Ice is Everywhere, Climate Regions, Wetlands for Flood Control, Conserving Water during Droughts, Come a Tide, Floods* **DR:** All About Climate and Seasons, Aquatic Surface Dwellers, Aquatic Insect Adaptations, Expansion and Contraction of Water, Climate-Regions Map, Tutorials Inv 1, 2, 3
4.E1U2.10 Define problem(s) and design solution(s) to minimize the effects of natural hazards.	**FOSS Next Generation Water and Climate** **TE:** Investigation 4, all Parts **SE:** *Climate Regions, Wetlands Flood Control, Conserving Water during Droughts* **DR:** All About Climate and Seasons, Climate-Regions Map, Come a Tide, Floods **FOSS Next Generation Soils, Rocks, and Landforms** **TE:** Investigation 3, Parts 2-4 **SE:** *The Story of Mt. Shasta, It Happened So Fast!* **DR:** Volcanoes, Topographer, Mt. St. Helens Impact, All About Earthquakes

Grade 4

Life Science

Students develop an understanding of the diversity of past and present organisms, factors impacting organism diversity, and evidence of change of organisms over time.

State Standard	FOSS Program
4.L4U1.11 Analyze and interpret environmental data to demonstrate that species either adapt and survive, or go extinct over time.	**FOSS Next Generation Water and Climate** **TE:** Investigation 4, Parts 2 and 3 **SE:** *Climate Regions, Wetlands for Flood Control* **DR:** *All About Climate and Seasons, Climate-Regions Map, Come a Tide, Floods* **FOSS Next Generation Soils, Rocks, and Landforms** **TE:** Investigation 2, Parts 3 and 4 **SE:** *Fossils Tell a Story, Pieces of a Dinosaur Puzzle* **DR:** Stream Tables, Stream Formation, Fossils

STEM Engineering

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State Standard	FOSS Program
Core Idea U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.	**FOSS Next Generation Water and Climate** **TE:** Investigation 4, Part 3 Investigation 5, Part 3 **SE:** *Conserving Water during Droughts; Wetlands for Flood Control, Making Drinking Water Safe; Using the Energy of Water* **DR:** Floods **FOSS Next Generation Energy** **TE:** Investigation 1, Parts 3 and 4 Investigation 5, Part 3 **SE:** *Series and Parallel Circuits, Thinking like an Engineer, Engineering a Solar Lighting Solution, Alternative Sources of Electricity, Mr. Osgood's Class Report* **DR:** D-Cell Orientation; Tutorial: Series and Parallel Circuits, Wave **FOSS Next Generation Soils, Rocks and Landforms** **TE:** Investigation 3, Part 3 Investigation 4, Parts 2, 3 **SE:** *Making Concrete, Earth Materials in Art*

Grade 5
Physical Science

Physical Sciences: Students develop an understanding that changes can occur to matter/objects on Earth or in space, but both energy and matter follow the pattern of being conserved during those changes.

State Standard	FOSS Program
5.P1U11.1 Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see and, in a closed system, if properties change or chemical reactions occur, the amount of matter stays the same.	**FOSS Next Generation Mixtures and Solutions** **TE:** Investigation 1, All Parts Investigation 2, Part 3 Investigations 3-5, All Parts **SE:** *Mixtures, Taking Mixtures Apart, Extracts, Solid to Liquid, Liquid and Gas Changes, Solutions Up Close, Concentrated Solutions, The Bends, A Sweet Solution, Sour Power, Drinking Ocean Water, When Substances Change* **DR:** Mixtures, Solutions, Separating Mixtures, Changes in Properties of Matter, Why Are Oceans Salty? Conservation of Mass, Density, The Water Cycle, Solubility, Fizz Quiz, Reaction or Not?
5.P1U11.2 Plan and carry out investigations to demonstrate that some substances combine to form new substances with different properties and others can be mixed without taking on new properties.	**FOSS Next Generation Mixtures and Solutions** **TE:** Investigation 1, all Parts Investigation 2, Part 3 Investigation 5, All Parts **SE:** *Mixtures, Taking Mixtures Apart, Extracts, Solid to Liquid, Liquid and Gas Changes, When Substances Change* **DR:** Separating Mixtures, Changes in Properties of Matter, Chemical Reactions, Fizz Quiz, Reaction or Not?
5.P2U1.3 Construct an explanation using evidence to demonstrate that objects can affect other objects even when they are not touching.	
5.P3U1.4 Obtain, analyze, and communicate evidence of the effects that balanced and unbalanced forces have on the motion of objects.	**FOSS Next Generation Variables and Design** **TE:** Investigation 1, Part 1 **SE:** *What Scientists and Engineers Do? What's a Trolley?* **DR:** What's an Engineer? *Engineering Problems, Zip Line*
5.P3U2.5 Define problems and design solutions pertaining to force and motion.	**FOSS Next Generation Variables and Design** **TE:** Investigation 1, All Parts Investigation 2, All Parts **SE:** *What Scientists and Engineers Do? Keep your Variables Under Control, Efficiency* **DR:** *Blasto! Virtual Aquarium, What's an Engineer, Engineering Problems, Zip Line*
5.P4U1.6 Analyze and interpret data to determine how and where energy is transferred when objects move.	**FOSS Next Generation Variables and Design** **TE:** Investigation 2, Part 1 **SE:** *Efficiency, Lead Detectors, Solar Tents* **DR:** Bridge Design, Engineering Design Cycle

Grade 5
Earth and Space Science

Students develop an understanding of the how gravitational forces in space cause observable patterns due to the position of Earth, Sun, Moon, and stars.

State Standard	FOSS Program
5.E2U1.7 Develop, revise, and use models based on evidence to construct explanations about the movement of the Earth and Moon within our solar system.	
5.E2U1.8 Obtain, analyze, and communicate evidence to support an explanation that the gravitational force of Earth on objects is directed toward the planet's center.	

Life Science

Students develop an understanding of patterns and how genetic information is passed from generation to generation. They also develop the understanding of how genetic information and environmental features impact the survival of an organism.

State Standard	FOSS Program
5.L3U1.9 Obtain, evaluate, and communicate information about patterns between the offspring of plants, and the offspring of animals (including humans); construct an explanation of how genetic information is passed from one generation to the next.	**FOSS Next Generation Environments** **TE:** Investigation 3, Part 4 Investigation 4, Part 3 **SE:** *Variation and Selection* **DR:** All About Plant Adaptations
5.L3U1.10 Construct an explanation based on evidence that the changes in an environment can affect the development of the traits in a population of organisms.	**FOSS Next Generation Environments** **TE:** Investigation 1, All Parts Investigation 2, Parts 1 and 3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 **SE:** *Two Terrestrial Environments, Darkling Beetles, Setting Up a Terrarium, Isopods, Amazon Rainforest Journal, Freshwater Environments, Human Activities and Aquatic Ecosystems, Comparing Aquatic and Terrestrial Ecosystems, Brine Shrimp, The Mono Lake Story, What Happens When Ecosystems Change, The Shrimp Club* **DR:** Deserts, Animals of the Rainforest, Animal Needs, Virtual Terrarium and Aquarium, Food Webs, Trout Range of Tolerance
5.L4U3.11 Obtain, evaluate, and communicate evidence about how natural and human-caused changes to habitats or climate can impact populations.	**FOSS Next Generation Environments** **TE:** Investigation 1, All Parts Investigation 2, Parts 1 and 3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 **SE:** *Two Terrestrial Environments, Darkling Beetles, Setting Up a Terrarium, Isopods, Amazon Rainforest Journal, Freshwater Environments, Human Activities and*

Grade 5

	Aquatic Ecosystems, Comparing Aquatic and Terrestrial Ecosystems, Brine Shrimp, The Mono Lake Story, What Happens When Ecosystems Change, The Shrimp Club **DR:** Deserts, Animals of the Rainforest, Animal Needs, Virtual Terrarium and Aquarium, Food Webs, Trout Range of Tolerance
5.L4U3.12 Construct an argument based on evidence that inherited characteristics can be affected by behavior and/or environmental conditions.	**FOSS Next Generation Environments** **TE:** Investigation 1, All Parts Investigation 2, Parts 1 and 3 Investigation 3, Parts 1-3 Investigation 4, Parts 1-2 **SE:** *Two Terrestrial Environments, Darkling Beetles, Setting Up a Terrarium, Isopods, Amazon Rainforest Journal, Freshwater Environments, Human Activities and Aquatic Ecosystems, Comparing Aquatic and Terrestrial Ecosystems, Brine Shrimp, The Mono Lake Story, What Happens When Ecosystems Change, the Shrimp Club* **DR:** Deserts, Animals of the Rainforest, Animal Needs, Virtual Terrarium and Aquarium, Food Webs, Trout Range of Tolerance

STEM Engineering

Engineering is a systematic and often iterative approach to designing objects, processes, and systems to meet human needs and wants. This includes defining and delimiting an engineering problem, developing possible solutions and optimizing the design solution (*A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. (2012). Washington: The National Academies Press. p. 202-203).*

State Standard	FOSS Program
Core Idea U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products	**FOSS Next Generation Mixtures and Solutions** **TE:** Investigation 1, Part 3 Investigation 4 Part 4 **SE:** *Taking Mixtures Apart, Science Practices, Engineering Practices, Drinking Ocean Water, Creative Solutions* **DR**: Separating Mixtures; Elements, Compounds, and Mixtures, Water Cycle: Runoff **FOSS Next Generation Variables and Design** **TE:** Investigations 1-3, All Parts **SE:** *What Scientists and Engineers Do? Keep your Variables Under Control, Efficiency, Lead Detectors, Solar Tents, The Problem of Traffic, Digital Manufacturing, Spotlight Engineering* **DR:** 3-D Printing, Bridge Design, Engineering Design Cycle, Genetic Engineering, Jumping Robot, Maker Space, What is an Engineer?