



FOSS Full Option Science System
(FOSS™)
Grades K-8

Correlation
with the

Ohio
Science Content Standards



Full Option Science System (FOSS™) Grades K-8

Correlation
with the

Ohio State Standards

The following correlation of the Ohio Science Standards to the Full Option Science System (FOSS) Program is to show representative examples of investigations and activities that address listed standards and benchmarks. A citation does not reflect all of the investigations or activities that might address a particular standard or grade level expectation.

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Earth and Space Science

Benchmarks (Grades K-2)

By the end of the K-2 program:

- A. Observe constant and changing patterns of objects in the day and night sky.
- B. Explain that living things cause changes on Earth.
- C. Observe, describe and measure changes in the weather, both long term and short term.
- D. Describe what resources are and recognize some are limited but can be extended through recycling or decreased use.

Kindergarten Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Observe that the Sun can be seen only in the daytime, but the Moon can be seen sometimes at night and sometimes during the day.	Air and Weather (Recommended for grades 1-2)	Investigation 4, Part 3, pp. 19-24
2. Explore that animals and plants cause changes to their surroundings.		
3. Explore that sometimes change is too fast to see and sometimes change is too slow to see.		
4. Observe and describe day-to-day weather changes (e.g., today is hot, yesterday we had rain).	Air and Weather (Recommended for grades 1-2)	Investigation 2, Part 1, pp. 8-13 Investigation 4, Part 1, pp. 8-11
5. Observe and describe seasonal changes in weather.	Trees	Science Stories, pp. 14-24
First Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment and that resources are necessary to meet the needs and wants of a population.	Trees (Recommended for Grade K) Fabric (Recommended for Grade K) Wood and Paper (Recommended for Grade K) Pebbles, Sand and Silt	Investigation 1 and 3, All Parts Science Stories, pp. 14-21 Investigation 1, All Parts Science Stories, pp. 3-15 Investigation 1 and 3, All Parts Science Stories, pp. 3-8, 13-18 Investigation 3, Parts 1, 3-5, pp. 8-11, 17-29 Science Stories, pp. 14-17 Language Extension, p. 30 Social Science Extension, p. 31
2. Explain that the supply of many resources is limited but the supply can be extended through careful use, decreased	Wood and Paper (Recommended for Grade K)	Investigation 4, All Parts Science Stories, pp. 19-23

use, reusing and/or recycling.		
3. Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow. (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks).		
Second Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Recognize that there are more stars in the sky than anyone can easily count.	Air and Weather	Investigation 4, Part 3, pp. 19-24
2. Observe and describe how the Sun, Moon and stars all appear to move slowly across the sky.	Air and Weather	Investigation 4, Part 3, pp. 19-24
3. Observe and describe how the Moon appears a little different every day but looks nearly the same again about every four weeks.	Air and Weather	Investigation 4, Part 3, pp. 19-24
4. Observe and describe that some weather changes occur throughout the day and some changes occur in a repeating seasonal pattern.	Air and Weather	Investigation 2, Part 1, pp. 9-13 Investigation 4, Parts 1-2, pp. 9-18
5. Describe weather by measurable quantities such as temperature and precipitation.	Air and Weather	Investigation 2, Parts 2, 4, pp. 14-19, 24-27 Investigation 4, Parts 2, 4, pp. 12-16, 22-27

Benchmarks (Grades 3-5)

By the end of the 3-5 program:

- A. Explain the characteristics, cycles and patterns involving Earth and its place in the Solar System.
- B. Summarize the processes that shape Earth's surface and describe evidence of those processes.
- C. Describe Earth's resources including rocks, soil, water, air, animals and plants and the ways in which they can be conserved.
- D. Analyze weather and changes that occur over a period of time.

Third Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Compare distinct properties of rocks (e.g., color, layering, texture).	Earth Materials Pebbles, Sand and Silt (Recommended for Grades 1-2)	Investigation 1, Part 1, pp. 8-15 Science Stories, pp. 3-7
2. Observe and investigate that rocks are often found in layers		
3. Describe that smaller rocks come from the breakdown of larger rocks through the actions of plants and weather.	Pebbles, Sand and Silt (Recommended for Grades 1-2)	Science Stories, pp. 8-13
4. Observe and describe the composition of soil (e.g., small	Pebbles, Sand and Silt (Recommended for	Investigation 4, Part 1, pp. 8-14 Science Stories, pp. 18-21

pieces of rock and decomposed pieces of plants and animals, and products of plants and animals).	Grades 1-2)	
5. Investigate the properties of soil (e.g., color, texture, capacity to retain water, ability to support plant growth).	Pebbles, Sand and Silt (Recommended for Grades 1-2)	Investigation 4, Parts 2-3, pp. 15-21 Science Stories, pp. 22-23
6. Investigate that soils are often found in layers and can be different from place to place.		
Fourth Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that air surrounds us, takes up space, moves around us as wind, and may be measured using barometric pressure.	Air and Weather (Recommended for Grades 1-2)	Investigation 1, Parts 1-2, 4, pp. 8-16, 21-26
2. Identify how water exists in the air in different forms (e.g., in clouds, fog, rain, snow and hail).	Water	Investigation 3, Part 4, pp. 22-25 Science Stories, pp. 14-16
3. Investigate how water changes from one state to another (e.g., freezing, melting, condensation, evaporation).	Water Matter and Energy	Investigation 2, Part 3, pp. 19-24 Investigation 3, Parts 1-4, pp. 8-26 Science Stories, pp. 8-16 Investigation 4, Part 2, pp. 181-192
4. Describe weather by measurable quantities such as temperature, wind direction, wind speed, precipitation, and barometric pressure.	Air and Weather (Recommended for Grades 1-2) Water	Investigation 2, Parts 2, 4, pp. 14-19, 24-27 Investigation 3, Parts 2, 4, pp. 12-16, 22-27 Investigation 2, Part 1, pp. 8-1
5. Record local weather information on a calendar or map and describe changes over a period of time (e.g., barometric pressure, temperature, precipitation symbols, cloud conditions).	Air and Weather (Recommended for Grades 1-2)	Investigation 2, Part 1, pp. 8-13 Investigation 4, Parts 1-2, pp. 8-18
6. Trace how weather patterns generally move from west to east in the United States.		
7. Describe the weather which accompanies cumulus, cumulonimbus, cirrus and stratus clouds.	Air and Weather (Recommended for Grades 1-2)	Investigation 2, Part 3, pp. 20-23
8. Describe how wind, water and ice shape and reshape Earth's land surface by eroding rock and soil in some areas and depositing them in other areas producing characteristic landforms (e.g., dunes, deltas, glacial moraines).	Landforms (Recommended for Grades 5-6) Water	Investigation 2, Parts 1-2, pp. 8-22 Investigation 3, Parts 1-3, pp. 8-24 Science Stories, pp. 15-23 Science Stories, pp. 22-23
9. Identify and describe how freezing, thawing and plant growth reshape the land surface by causing the weathering of rock.		
10. Describe evidence of changes on Earth's surface in terms of slow processes (e.g., erosion,	Earth Materials	Investigation 2, Parts 14-19 Investigation 2, Science Extension, p. 24

weathering, mountain building, deposition) and rapid processes (e.g. volcanic eruptions, earthquakes, landslides).	Landforms (Recommended for Grades 5-6)	Investigation 2, Parts 1-2, pp. 8-22 Investigation 3, Parts 1-3, pp. 8-24 Science Stories, pp. 9-14, 15-21, 43-44
Fifth Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe how night and day are caused by Earth's rotation.	Solar Energy	Investigation 1, Science Extension, p. 24 Science Stories, pp. 1-5
2. Explain that Earth is one of several planets to orbit the Sun, and that the Moon orbits Earth.	Models and Designs Water Planet	Science Stories, pp. 5-9 Investigation 1, Part 1, pp. 50-58 Science Resources, pp. 1-13
3. Describe the characteristics of Earth and its orbit about the Sun (e.g., three-fourths of Earth's surface covered by a layer of water [some of it frozen], the entire planet surrounded by a thin blanket of air, elliptical orbit, tilted axis, spherical planet).	Water (Recommended for Grades 3-4) Environments Water Planet	Science Stories, pp. 1-2, 8-9, 12, 17-21 Science Stories, pp. 27-35 Investigation 1, Part 1, pp. 50-58 Science Resources, p. 6
4. Explain that stars are like the Sun, some being smaller and some larger, but so far away that they look like points of light.		
5. Explain how the supply of many non-renewable resources is limited and can be extended through reducing, reusing and recycling but cannot be extended indefinitely.	Water (Recommended for Grades 3-4) Water Planet	Science Stories, pp. 17-21, 27-29 Science Resources, pp. 65-66
6. Investigate ways Earth's renewable resources (e.g., fresh water, air, wildlife and trees) can be maintained.	Solar Energy Environments Water Planet	Investigation 3, Home School Connection Science Stories, pp. 22-24 Science Stories, pp. 36-37, 43-46 Science Resources, pp. 65-66

Benchmarks (Grades 6-8)

By the end of the 6-8 program:

- A. Describe how the positions and motions of the objects in the universe cause predictable and cyclic events.
- B. Explain that the universe is composed of vast amounts of matter, most of which is at incomprehensible distances and held together by gravitational force.
- C. Describe how the universe is studied by the use of equipment such as telescopes, probes, satellites and spacecraft.
- D. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution).
- E. Identify that the lithosphere contains rocks and minerals and that minerals make up rocks. Describe how rocks and minerals are formed and/or classified.

- F. Describe the processes that contribute to the continuous changing of Earth’s surface (e.g., earthquakes, volcanic eruptions, erosion, mountain building and lithospheric plate movements).

Sixth Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe the rock cycle and explain that there are sedimentary, igneous and metamorphic rocks that have distinct properties (e.g., color, texture) and are formed in different ways.	Models and Designs Earth History	Science Stories, pp. 11-12 Investigation 5, Parts 1-4, pp. 175-193 Investigation 8, Parts 1-3, pp. 254-270 Resources, pp. 42-46, 73-75, 93-97 CD, Formation of Metamorphic, Igneous and Sedimentary Rocks CD, Rock Database
2. Explain that rocks are made of one or more minerals.	Earth Materials (Recommended for grades 3-4) Earth History	Investigation 1, Parts 1-3, pp. 8-29 Investigation 3, Part 1, pp. 88-95 Investigation 4, Parts 1-2, pp. 127-137 Investigation 5, Parts 1-3, pp. 175-187 Investigation 8, Parts 1-3, pp. 254-269 Resources, pp. 42-46, 73-75, 89-92, 93-97 CD, Rock Database
3. Identify minerals by their characteristic properties.	Earth Materials (Recommended for grades 3-4) Earth History Planetary Science	Investigation 2, Parts 1-2, pp. 8-21 Investigation 3, Parts 1-2, pp. 8-19 Investigation 4, Parts 1-2, pp. 8-18 Investigation 3, Part 1, pp. 88-95 Investigation 4, Parts 1-2, pp. 127-137 Investigation 5, Parts 1-3, pp. 175-187 Investigation 8, Parts 1-2, pp. 254-265 Resources, pp. 73-75, 93-97 Investigation 8, Parts 2, 4, pp. 255-259, 265-270 CD, Moon Rocks and Minerals, Earth Rocks and Minerals
Seventh Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain the biogeochemical cycles which move materials between the lithosphere (land), hydrosphere (water) and atmosphere (air).	Earth History Weather and Water	Investigation 4, Parts 1-6, pp. 127-162 Investigation 5, Parts 1-3, pp. 175-187 Investigation 8, Part 1, pp. 254-258 Resources, pp. 64-67, 73-75, 93-97 Video: Weathering and Erosion CD, Geology Lab, sand Types CD, Geology Lab, Earth Processes Investigation 4, Parts 1-2, pp. 121-139 Investigation 5, Parts 2-3, p. 163-174 Investigation 6, Parts 1-4, pp. 190-213 Investigation 7, Parts 1-2, pp. 232-243 Resources, pp. 32-36 CD, Cycles: Water Cycle

2. Explain that Earth’s capacity to absorb and recycle materials naturally (e.g., smoke, smog, sewage) can change the environmental quality depending on the length of time involved (e.g., global warming.)	Weather and Water	Investigation 9, Part 4, pp. 315-318 Resources, pp. 63-66
3. Describe the water cycle and explain the transfer of energy between the atmosphere and hydrosphere.	Weather and Water	Investigation 6, Parts 1-4, pp. 190-213 Investigation 7, Parts -12, pp. 232-243 CD, Cycles, Water Cycle
4. Analyze data on the availability of freshwater that is essential for life and for most industrial and agricultural processes. Describe how rivers, lakes and groundwater can be depleted or polluted becoming less hospitable to life and even becoming unavailable or unsuitable for life.	Weather and Water	Investigation 7, Parts 1-2, pp. 232-243 Resources, pp. 45-47
5. Make simple weather predictions based on the changing cloud types associated with frontal systems.	Weather and Water	Investigation 6, Part 4, pp. 206-213 Investigation 9, Parts 1-2, pp. 296-310 Resources, pp. 37-42 CD, Cloud in a Bottle
6. Determine how weather observations and measurements are combined to produce weather maps that that data for a specific location at one point in time can be displayed in a station model.	Weather and Water	Investigation 1, Parts 1-2, pp. 43-53 Investigation 8, Part 4, pp. 276-279 Investigatin 9, Part 2, pp. 304-310 Video: Wonders of Weather
7. Read a weather map to interpret local, regional and national weather.	Weather and Water	Investigation 1, Part 2, pp. 48-53 Investigation 8, Part 4, pp. 276-279 Investigation 9, Part 2, pp. 304-310 Video: Wonders of Weather Extending the Experience-Check out Local Weather, p. 320
8. Describe how temperature and precipitation determine climate zones (biomes) (e.g., desert, grasslands, forests, tundra, alone).	Weather and Water Populations and Ecosystems	Investigation 9, Part 3, pp. 312-318 CD, Climate Factors Investigation 7, pp. 210-217 Resources, pp. 30-41
9. Describe correlation between the water cycle and weather-related phenomenon (e.g., tornadoes, floods, droughts, hurricanes).	Weather and Water	Investigation 7, Parts 1-2, pp.232-243 Resources, pp. 69-76
Eighth Grade Earth and Space Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe how objects in the Solar System are in regular and predictable motions that explain such phenomena as days, years, seasons, eclipses, tides and moon cycles.	Planetary Science	Investigation 3, Parts 1-2, pp. 89-98 Investigation 4, Part 1, pp. 120-125 Investigation 9, Parts 1-4, pp. 287-301 Investigation 10, Part 2-3, pp. 318-324 Resources, pp. 8, 80-89 CD, Day/Night Simulation CD, Lunar Calendar

	Weather and Water	CD, Phases of the Moon Investigation 3, Parts 1-3, pp. 93-110 Resources, pp. 17-19 CD, Cycles: Seasons
2. Explain that the gravitational force is dominant force determining motions in the Solar System and in particular keeps the planets in orbit around the sun.	Planetary Science Force and Motion	Investigation 10, Parts 2-3, pp. 318-324 Resources, pp. 84-89 Resources, pp. 67-69
3. Compare the orbits and composition of comets and asteroids with that of Earth.	Planetary Science	Resources, pp. 84-89 Video: Asteroids-Deadly Impact
4. Describe the effect that asteroids or meteoroids have when moving through space and sometimes entering planetary atmospheres (e.g., meteor-“shooting star” and meteorite).	Planetary Science	Investigation 5, Parts 1-7, pp. 154-182 Resources, pp. 59-62, 63-66, 67-68, 69-70 CD, Crater Formation CD, Origin of the Moon Simulations
5. Explain that the universe consists of billions of galaxies that are classified by shape.	Planetary Science	Resources, p. 100
6. Explain interstellar distances are measured in light years (e.g., the nearest star is 4.3 light years away).	Planetary Science	Resources, pp. 97, 100
7. Examine the life cycle of a star and predict the next likely stage of a star.		
8. Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).	Planetary Science	Investigation 4, Part 2, pp. 126-131 Investigation 5, Parts 1, 4-6, pp. 154-157, 168-179 Investigation 6, Part 1, pp. 192-196 Investigation 7, Parts 1-4, pp. 218-235 Resources, pp. 35, 59-62, 63-66, 74-77, 90-96 CD, Space Exploration
9. Describe the interior structure of Earth and Earth’s crust as divided into tectonic plates riding on top of the slow moving currents of magma in the mantle.	Earth History	Investigation 8, Parts 1-3, pp. 254-269 Resources, pp. 42-46, 89-92, 93-97, 100-105 CD, Geology Lab CD, Rock Database
10. Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion.	Earth History	Investigation 8, Parts 1-3, pp. 254-269 Resources, pp. 93-97, 100-105 CD, Geology Lab, Earth Processes CD, Geology Lab
11. Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, satellite images).	Earth History Planetary Science	Investigation 2, Parts 1-4, pp. 60-74 Investigation 3, Parts 1-4, pp. 88-111 Resources, pp. 55-59 Investigation 1, Parts 1-3, pp. 38-52 Investigation 2, Parts 1-2, pp. 64-77 Investigation 3, Parts 1-2, pp. 89-98

	Weather and Water	Investigation 9, Part 2, pp. 288-295 Resources, pp. 52-53 CD, Day/Night Simulation Investigation 3, Parts 2-3, pp. 97-110
12. Explain that some processes involved in the rock cycle are directly related to the thermal energy and forces in the mantle that drive plate motions.	Earth History	Investigation 2, Parts 1-4, pp. 88-111 Investigation 8, Parts 1-3, pp. 254-269 Resources, pp. 93-97, 100-105 CD, Geology Lab, Earth Processes
13. Describe how landforms are created through a combination of destructive (e.g., weathering and erosion) and constructive processes (e.g., crustal deformation, volcanic eruptions and deposition of sediment).	Earth History	Investigation 2, Parts 1-4, pp. 88-111 Investigation 4, Parts 1-6, pp. 127-162 Investigation 8, Parts 1-3, pp. 254-269 Resources, pp. 93-97, 100-105 CD, Geology Lab: Earth Processes Video: Weathering and Erosion
14. Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.	Earth History	Resources, pp. 93-97, 100-105 CD, Geology Lab, Earth Processes
15. Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes, ocean trenches).	Earth History	Resources, pp. 100-105

Life Science

Benchmarks (Grades K-2)

By the end of the K-2 program:

- A. Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms).
- B. Explain how organisms function and interact with their physical environment.
- C. Describe similarities and differences that exist among individuals of the same kind of plants and animals.

Kindergarten Life Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explore differences between living and non-living things (e.g., plant-rock).	Animals Two by Two	Investigation 1, Part 2, pp. 17-21
	New Plants (Recommended for Grades 1-2)	Investigation 1, Part 1, pp. 8-12
2. Discover that stories (e.g., cartoons, movies, comics) sometimes give plants and animals characteristics they really do not have (e.g., talking flowers).	Animals Two by Two	Investigation 1, Part 4 Reading Resource: A Fish Out of Water Language Extension, p. 31
3. Describe how plants and animals usually resemble their parents.	Animals Two by Two	Investigation 5, Parts 3-4, pp. 20-27 Home School Connection, p. 28 FOSS Web, Activity: Find the Parent
4. Investigate variations that exist among individuals of the same kind of plant or animal.	Animals Two by Two	Investigation 1, Parts 1, 3, pp. 10-16, 26-29 Investigation 5, Part 3, pp. 20-24
	Trees	Investigation 1, Part 1, pp. 7-13
5. Investigate observable features of plants and animals that help them live in different kinds of places.	Animals Two by Two	Investigation 1, Part 1, pp. 10-16 Investigation 2, Part 1, pp. 9-13 Investigation 4, Part 4, pp. 21-23 Science Stories, pp. 4-24
6. Investigate the habitats of many different kinds of local plants and animals and some of the ways in which animals depend on plants and each other in our community.	Animals Two by Two	Investigation 1-2, pp. 10-21 Investigation 2, Science Extension, p. 27 Investigation 3, Science Extension, p. 23 Investigation 4, Science Extension, p. 24
	Trees	FOSS Web, Activity: Who Lives Here?
First Grade Life Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter.	New Plants	Investigation 1, Part 2, pp. 19-22 Investigation 2, Part 1, pp. 8-14 Science Stories, pp. 3-7
	Insects	Investigation 1, Part 1, pp. 8-15 Investigation 2, Part 1, pp. 8-13

	<p>Insects and Plants</p> <p>Plants and Animals</p>	<p>Investigation 3, Part 2, pp. 12-20 Investigation 4, Part 2, pp. 14-15 Investigation 5, Part 1, pp. 8-15</p> <p>Investigation 1, Part 1, pp. 52-61 Investigation 2, Part 1, pp. 91-94 Investigation 3, Part 2, pp. 134-144 Investigation 4, Part 2, pp. 170-174 Investigation 5, Part 1, pp. 206-211</p> <p>Investigation 1, Part 1, pp. 47-57 Investigation 3, Parts 1-2, pp. 120-134 Science Resources, pp. 3-7, 21-26 Video: How Plants Get Food</p>
2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests).	<p>New Plants</p> <p>Insects</p> <p>Plants and Animals</p>	<p>Investigation 2, Part 3, pp. 20-28 Science Stories, pp. 12-17</p> <p>Science Stories, pp. 3-7</p> <p>Science Resources, pp. 9-13</p>
3. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry (e.g., sharp teeth, flat teeth, good nose, sharp vision).	<p>Insects</p> <p>Plants and Animals</p> <p>Insects and Plants</p>	<p>Investigation 1, Part 2, pp. 16-22 Investigation 3, Part 3, pp. 21-26 Investigation 5, Part 3, pp. 20-24 Science Stories, pp. 12-15</p> <p>Investigation 4, Part 2, pp. 157-163 Science Resources, pp. 22-23</p> <p>Investigation 1, Part 2, pp. 62-70 Investigation 3, Part 3, pp. 145-151 Investigation 5, Part 3, pp. 219-225 Science Resources, pp. 30-33</p>
4. Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.	<p>Insects</p> <p>Insects and Plants</p> <p>Plants and Animals</p> <p>Trees (Recommended for Grade K)</p>	<p>Investigation 3, Part 2, pp. 12-20 Investigation 5, Parts, 1-2, pp. 10-19 Science Stories, pp. 3-7</p> <p>Investigation 3, Part 2, pp. 134-144 Investigation 5, Parts 1-2, pp. 206-218</p> <p>Investigation 3, Parts 1-3, pp. 120-140 Science Resources, pp. 29-30, 32-33, 35-36, 38-39, 41-42, 44-45, 47-50</p> <p>FOSS Web, Activity: Who Lives Here?</p>
5. Recognize that seasonal changes can influence the health, survival or activities of organisms.	<p>Trees (Recommended for Grade K)</p> <p>Plants and Animals</p>	<p>Investigation 3, Parts 1-9, pp. 10-38 Science Stories, pp. 14-19</p> <p>Science Resources, pp. 31-33</p>
Second Grade Life Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that animals, including people, need air, water, food, living space and shelter, and plants need	Insects	Investigation 1, Part 1, pp. 8-15 Investigation 3, Part 2, pp. 12-20 Investigation 4, Part 2, pp. 14-15

<p>air, water, nutrients (e.g., minerals), living space and light to survive.</p>	<p>New Plants</p> <p>Insects and Plants</p> <p>Plants and Animals</p>	<p>Investigation 5, Part 1, pp. 8-15</p> <p>Investigation 1, Part 2, pp. 13-22 Science Stories, pp. 3-7</p> <p>Investigation 1, Part 1, pp. 52-61 Investigation 2, Part 1, pp. 91-94 Investigation 3, Part 2, pp. 134-144 Investigation 4, Part 2, pp. 170-174 Investigation 5, Part 1, pp. 206-211</p> <p>Investigation 1, Part 1, pp. 47-57 Investigation 3, Parts 1-2, pp. 120-134 Science Resources, pp. 3-7, 21-26 Video: How Plants Get Food</p>
<p>2. Identify that there are many distinct environments that support different kinds of organisms.</p>	<p>New Plants</p> <p>Plants and Animals</p>	<p>Science Stories, pp. 22-39</p> <p>Science Resources, pp. 28-45</p>
<p>3. Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on Earth have disappeared for different reasons such as natural forces or human-caused effects).</p>	<p>New Plants</p>	<p>Investigation 2, Part 2, pp. 15-19</p>
<p>4. Compare similarities and differences among individuals of the same kind of plants and animals, including people.</p>	<p>Insects</p> <p>Insects and Plants</p> <p>Animals Two by Two (Recommended for Grade K)</p>	<p>FOSS provides the opportunity to address this indicator. See below:</p> <p>Insects Investigation 1, Part 1, pp. 1-13 Investigation 2, Part 1, pp. 8-13 Investigation 4, Part 2, pp. 14-18 Science Stories, p. 22</p> <p>Insects and Plants Investigation 1, Part 1, pp. 52-61 Investigation 2, Part 3, pp. 105-115 Investigation 4, Part 2, pp. 170-174 Science Resources, pp. 20-24, 42</p> <p>Animals Two by Two Investigation 1, Parts 1, 3, pp. 10-16, 26-29</p>
<p>5. Explain that food is a basic need of plants and animals (e.g., plants need sunlight to make food and to grow, animals eat plants and/or other animals for food, food chain) and is important because it is a source of energy (e.g., energy used to play, ride bicycles, read, etc.).</p>	<p>Insects</p> <p>New Plants</p> <p>Plants and Animals</p> <p>Insects and Plants</p>	<p>Investigation 1, Part 1, pp. 8-15 Investigation 3, Part 2, pp. 12-20 Investigation 4, Part 2, pp. 14-15 Investigation 5, Part 1, pp. 8-15</p> <p>Investigation 1, Part 2, pp. 13-22 Science Stories, pp. 3-7</p> <p>Investigation 1, Part 1, pp. 47-57 Science Resources, pp. 3-7, 21-23 Video: How Plants Get Food</p> <p>Investigation 1, Part 1, pp. 52-61 Investigation 2, Part 1, pp. 91-94</p>

		Investigation 3, Part 2, pp. 134-144 Investigation 4, Part 2, pp. 170-174 Investigation 5, Part 1, pp. 206-211
6. Investigate the different structures of plants and animals that help them live in different environments (e.g., lungs, gills, leaves and roots).	<p>New Plants</p> <p>Insects</p> <p>Insects and Plants</p> <p>Plants and Animals</p> <p>Animals Two by Two (recommended for grade K)</p>	<p>Investigation 1, Part 3, pp. 23-30 Investigation 3, Parts 1-3, pp. 8-25 Science Stories, pp. 3-7</p> <p>Investigation 1, Part 2, pp. 16-22 Investigation 2, Part 3, pp. 20-24 Science Stories, pp. 12-15</p> <p>Investigation 1, Part 2, pp. 62-70 Investigation 2, Part 3, pp. 105-115 Investigation 3, Part 3, pp. 145-151 Science Resources, pp. 26-31</p> <p>Investigation 2, Parts 1-3, pp. 87-108 Investigation 3, Part 3, pp. 1135-140 Investigation 4, Parts 1-2, pp. 151-163 Science Resources, pp. 3-7, 28-45 Video: How Plants Live in Different Places</p> <p>Investigation 1, Part 1, pp. 10-16 Investigation 2, Part 1, pp. 9-13 Science Stories, pp. 4-7</p>
7. Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and each other.	Local Objective	
8. Compare the activities of Ohio's common animals (e.g., squirrels, chipmunks, deer, butterflies, bees, ants, bats and frogs) during the different seasons by describing changes in their behaviors and body covering.	Local Objective	;
9. Compare Ohio plants during the different seasons by describing changes in their appearance.	<p>Trees (recommended for grade K)</p> <p>New Plants</p> <p>Plants and Animals</p>	<p>Investigation 3, Parts 1-9, pp. 10-38</p> <p>Science Stories, pp. 12-17</p> <p>Science Resources, pp. 9-12</p>

Benchmarks (Grades 3-5)

By the end of the 3-5 program:

- A. Differentiate between the life cycles of different plants and animals.
- B. Analyze plant and animal structures and functions needed for survival and describe the flow of energy through a system that all organisms use to survive.
- C. Compare changes in an organism's ecosystem/habitat that affect its survival.

Third Grade Life Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>

1. Compare the life cycles of different animals including birth to adulthood, reproduction and death (e.g., egg-tadpole-frog, egg-caterpillar-chrysalis-butterfly).	Structures of Life	Science Stories, pp. 20-21 FOSS Web, Activity: Life Cycles
2. Relate animal structures to their specific survival functions (e.g., obtaining food, escaping or hiding from enemies).	Structures of Life	Investigation 3, Part 1, pp. 8-15 Investigation 4, Part 1, pp. 8-13 Science Stories, pp. 17-34
3. Classify animals according to their characteristics (e.g., body coverings and body structure).	Structures of Life	Investigation 4, Part 2, pp. 14-19 Science Stories, pp. 17-19, 41-42
4. Use examples to explain that extinct organisms may resemble organisms that are alive today.	Structures of Life	Science Stories, pp. 45-48
5. Observe and explore how fossils provide evidence about animals that lived long ago and the nature of the environment at that time.	Structures of Life	Science Stories, pp. 45-48
6. Describe how changes in an organism's habitat are sometimes beneficial and sometimes harmful.	Structures of Life	Science Stories, pp. 35-38, 45-48

Fourth Grade Life Science

<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Compare the life cycles of different plants including germination, maturity, reproduction and death.	Structures of Life	Investigation 1, Part 2, pp. 18-27 Investigation 2, Parts 1, 3, pp. 8-13, 18-22
2. Relate plant structures to their specific functions (e.g., growth, survival and reproduction).	Structures of Life	Investigation 1, Parts 1-3, pp. 8-33 Investigation 2, Part 3, pp. 18-22 Science Stories, pp. 1-3
3. Classify common plants according to their characteristics (e.g., tree leaves, flowers, seeds, roots, stems).	Structures of Life	Investigation 1, Part 1, pp. 8-17
4. Observe and explore that fossils provide evidence about plants that lived long ago and the nature of the environment at that time.		
5. Describe how organisms interact with one another in various ways (e.g., many plants depend on animals for carrying pollen or dispersing seeds).	Structures of Life	Science Stories, pp. 3, 35-38, 43

Fifth Grade Life Science

<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
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1. Describe the role of producers in the transfer of energy entering ecosystems as sunlight to chemical energy through photosynthesis.	Environments Food and Nutrition Living Systems	Science Stories, p. 39 Science Stories, p. 43 Investigation 3, Part 1, pp. 118-125 Science Resources, pp. 31-34, 47-48
2. Explain how almost all kinds of animals' food can be traced back to plants.	Environments	Science Stories, pp. 39-41, 43-45
3. Trace the organization of simple food chains and food webs (e.g., producers, herbivores, carnivores, omnivores and decomposers).	Environments	Science Stories, pp. 39-41, 43-45
4. Summarize that organisms can survive only in ecosystems in which their needs can be met (e.g., food, water, shelter, air, carrying capacity and waste disposal). The world has different ecosystems and distinct ecosystems support the lives of different types of organisms.	Environments	Investigation 1, Parts 1-2, pp. 8-19 Investigation 1, Language Extension, p. 20 Investigation 1, Science Extension, p. 22 Investigation 2, Part 4, pp. 26-30 Investigation 3, Part 3, pp. 18-22 Investigation 4, Part 1, pp. 8-12 Investigation 4, Language Extension, p. 23 Investigation 5, Parts 2-3, pp. 14-22 Science Stories, pp. 1-22, 27-35, 38-41
5. Support how an organism's patterns of behavior are related to the nature of that organism's ecosystem, including the kinds and numbers of other organisms present, the availability of food and resources, and the changing physical characteristics of the ecosystem.	Environments Water (Recommended for grades 3-4)	Investigation 2, Parts 2-4, pp. 16-30 Investigation 4, Parts 2-3, pp. 13-22 Science Stories, p. 21, 23-26, 38-41 Science Stories, pp. 5-7
6. Analyze how all organisms, including humans, cause changes in their ecosystems and how these changes can be beneficial, neutral or detrimental (e.g., beaver ponds, earthworm burrows, grasshoppers eating plants, people planting and cutting trees, and people introducing a new species).	Environments	Investigation 4, Part 2, pp. 12-18 Investigation 4, language Extension, p. 23 Investigation 5, Language Extension, p. 23 Investigation 5, Science Extension, p. 24 Investigation 6, Parts 1-2, pp. 8-17 Science Stories, pp. 27-37
Sixth Grade Life Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that many of the basic functions of organisms are carried out by or within cells and are similar in all organisms.	Food and Nutrition Living Systems Diversity of Life	Science Stories, pp. 41-43 Science Resources, p. 2 Investigation 3, Parts 1-3, pp. 102-122

		Investigation 4, Part 1-2, pp. 133-141 Investigation 7, Part 1, pp. 218-223 Investigation 10, Part 1, pp. 302-309 Resources, pp. 24-26, 27-30, 40-45, 65-70 CD, Cells and the Ribbon of Life
	Populations and Ecosystems	Investigation 9, Parts 267-273
2. Explain that multicellular organisms have a variety of specialized cells, tissues, organs and organ systems that perform specialized functions.	Food and Nutrition Living Systems Diversity of Life	Science Stories, pp. 41-43 Investigation 1, Parts 1-3, pp. 51-70 Science Resources, pp. 2-12 Investigation 4, Parts 1-2, pp. 133-141 Investigation 5, Parts 1-3, pp. 151-170 Investigation 6, Parts 1-3, pp. 186-202 Investigation 7, Part 1, pp. 218-223 Investigation 10, Part 1, pp. 302-309 Resources, pp. 27-30, 31-34, 35-39, 40-45, 65-70 CD, Cells and the Ribbon of Life
3. Identify how plant cells differ from animal cells (e.g., cell wall, chloroplasts).	Diversity of Life	Investigation 3, Part 1, pp. 102-107 Investigation 4, Parts 1-2, pp. 133-141 Resources, pp. 8-9, 27-30 CD, Cells and the Ribbon of Life
4. Recognize that an individual organism does not live forever; therefore reproduction is necessary for the continuation of every species and traits are passed on to the next generation through reproduction.	Diversity of Life Populations and Ecosystems	Investigation 7, Parts 1-2, pp. 218-229 Investigation 10, Parts 1-2, pp. 302-316 Resources, pp. 40-45, 51-54, 55-59, 60-64, 65-69 Investigation 9, Parts 1-4, pp. 262-291 Resources, pp. 46-55
5. Describe that in asexual reproduction all the inherited traits come from a single parent.	Diversity of Life	Investigation 10, Parts 1-2, pp. 302-316 Resources 24-26, 62, 65-70
6. Describe that in sexual reproduction an egg and sperm unite and some traits come from each parent, so the offspring is never identical to either of its parents.	Diversity of Life Populations and Ecosystems	Investigation 7, Part 1, pp. 218-223 Resources, pp. 40-45, 51-54, 55-59 Investigation 9, Parts 1-4, pp. 262-287 Resources, pp. 46-55
7. Recognize that likenesses between parents and offspring (e.g., eye color, flower color) are inherited. Other likenesses, such as table manners are learned.	Diversity of Life Populations and Ecosystems	Investigation 7, Part 1, pp. 218-223 Resources, pp. 40-45 Investigation 9, Parts 1-4, pp. 262-291 Resources, pp. 46-55
8. Describe how organisms may interact with one another.	Diversity of Life	Investigation 3, Parts 1-3, pp. 102-122 Investigation 7, Parts 1-2, pp. 218-229 Investigation 10, Part 1, pp. 302-309 Resources, pp. 24-26, 40-50, 65-70

	Populations and Ecosystems	CD, Pollination Game Video: Unknown World Investigation 3, Parts 1-3, pp. 90-107 Investigation 4, Parts 1-2, pp. 119-129 Investigation 5, Part 4, pp. 161-169 Investigation 7, pp. 210-217 Resources, pp. 17-21, 30-41 CD, Mono Lake: Food Web
Seventh Grade Life Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Investigate the great variety of body plans and internal structures found in multi-cellular organisms.	Diversity of Life	Investigation 3, Part 1, pp. 102-107 Investigation 5, Parts 1-3, pp. 151-170 Investigation 6, Parts 1-3, pp. 186-202 Investigation 7, Parts-12, pp. 218-229 Investigation 8, Part1, 3, pp. 239-243, 253-259 Investigation 9, Parts 1-2, pp. 273-285 Resources, pp. 31-34, 35-39, 46-50, 51-54, 55-59, 60-64
2. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism, commensalisms).	Diversity of Life Populations and Ecosystems	Investigation 7, Part 2, pp. 224-229 Resources, pp. 46-50, 60-64 CD, Collection: Seed Dispersal Investigation 3, Parts 1-3, pp. 90-107 Investigation 4, Parts 1-2, pp. 119-129 Investigation 5, Part 4, pp. 161-169 Investigation 6, Parts 1-3, pp. 179-197 Investigation 8, Parts 1-2, pp. 228-243 Resources, pp. 8-13, 14-16, 17-21, 42-45 CD, Mono Lake: Food Web
3. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water, soil).	Populations and Ecosystems	Investigation 3, Parts 1-3, pp. 90-107 Investigation 4, Parts 1-2, pp. 119-129 Investigation 5, Part 4, pp. 161-169 Investigation 6, Parts 1-3, pp. 179-197 Resources, pp. 8-13, 22-24 CD, Mono Lake: Food Web
4. Investigate how overpopulation impacts an ecosystem.	Populations and Ecosystems	Investigation 3, Parts 1-3, pp. 90-107 Investigation 5, Part 4, pp. 161-169 Investigation 6, Parts 1-3, pp. 179-197 Resources, pp. 22-24
5. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition).	Diversity of Life Populations and Ecosystem	Investigation 1, Extending the Experience, p.64 Investigation 4, Parts 1-2, pp. 119-129 Investigation 7, pp. 210-217 Resources, pp. 30-41 CD, Mono Lake CD, Ecoscenarios
6. Investigate the ways natural occurrences and human activity affect the transfer of	Diversity of Life	Investigation 8, Extending the Experience, p. 290

energy in Earth's ecosystems (e.g., fire, hurricanes, roads, oil spills).	Populations and Ecosystem	Investigation Parts 1-2, pp. 119-129 Investigation 7, pp. 210-217 Resources, pp.30-41 CD, Mono Lake Video: Of Ice and Fire: A Portrait of the Mono Basin
7. Explain that photosynthetic cells convert energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions.	Diversity of Life Populations and Ecosystem	Investigation 6, Part 2, pp. 193-197 Resources, pp. 35-39 Investigation 5, Parts 1-2, 4, pp. 142-155, 161-169 Resources, pp. 14-21
8. Investigate the great diversity among organisms.	Diversity of Life Populations and Ecosystem	Investigation 3, Parts 1-2, pp. 102-115 Investigation 5, Parts 1-3, pp. 151-170 Investigation 6, Parts 2-3, pp. 193-202 Investigation 7, Parts 1-2, pp. 218-229 Investigation 8, Part 3, pp. 253-259 Investigation 9, Part 3, pp. 286-289 Investigation 10, Parts 1, 3, pp. 302-309, 317-321 Resources, pp. 24-26, 31-34, 35-39, 40-45, 46-50, 60-64, 65-70 CD, Collection Video: Unknown World Investigation 3, Parts 1-3, pp. 90-107 Investigation 7, pp. 210-217

Eighth Grade Life Science

<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.	Diversity of Life	Investigation 10, Parts 1-2, pp. 302-316 Resources, pp. 65-70
2. Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.	Diversity of Life Populations and Ecosystems	Investigation 7, Part 1, pp. 218-223 Resources, pp. 40-45 Investigation 9, Parts 1-4, pp. 262-291 Investigation 10, Parts 1-3, pp. 302-318 Resources, pp. 46-55, 58-61
3. Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment.	Diversity of Life Populations and Ecosystems	Investigation 7, Parts 1-2, pp. 218-229 Investigation 9, Parts 1, 3, pp. 273-277, 286-289 Resources, pp. 40-50, 60-64 Investigation 8, Parts 1-2, pp. 228-243 Investigation 9, Parts 1-4, pp. 262-291 Investigation 10, Parts 1-3, pp. 302-18 Resources, pp. 42-45, 46-55, 58-61
4. Explain that diversity of species is developed through gradual processes over many generations	Earth History	Investigation 6, Parts 2, 3, pp. 210-219 Investigation 7, Parts 1-2, pp. 234-243 Resources, pp. 76-80, 83-88

(e.g., fossil record).	Populations and Ecosystems	Investigation 10, Parts 1-3, pp. 302-318 Resources, pp. 58-61, 62-63
5. Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.	Diversity of Life	Resources, pp. 60-64
	Earth History	Investigation 6, Parts 2-3, pp. 210-219 Investigation 7, Parts 1-2, pp. 234-243 Resources, pp. 76-80, 83-88 CD, Time Room
	Populations and Ecosystems	Investigation 7, pp. 210-217 Investigation 8, Part 1-2, pp. 228-243 Resources, pp. 30-41, 42-45

Physical Science

Benchmarks (Grades K-2)

By the end of the K-2 program:

- A. Discover that many objects are made of parts that have different characteristics.
- B. Describe these characteristics and recognize ways an object may change.
- C. Recognize that light, sound and objects move in different ways.
- D. Recognize sources of energy and their uses.

Kindergarten Physical Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Demonstrate that objects are made of parts (e.g., toys, chairs).	Wood and Paper	Science Stories, pp. 3-8
2. Examine and describe objects according to the materials that make up the object (e.g., wood, metal, plastic, cloth).	Wood and Paper Fabric	Investigation 1, Part 1-2, pp. 8-19 Investigation 2, Parts 3-4, pp. 16-23 Investigation 3, Parts 1-2, pp. 8-17 Investigation 5, Part 1, pp. 8-11 Science Stories, pp. 13-18 Investigation 1, Parts 1-2, 4, pp. 6-15, 20-22 Science Stories, pp. 3-24
3. Describe and sort objects by one or more properties (e.g., size, color, shape).	Fabric Trees	Investigation 1, Parts 1-3, pp. 6-19 Investigation 1, Parts 3-4, pp. 20-24 Investigation 2, Parts 2-6, pp. 10-28 Investigation 2, Math Extension, p. 29 Investigation 2, Language Extension, p. 29
4. Explore that things can be made to move in many different ways such as straight, zigzag, up and down, round and round, back and forth, or fast and slow.	Balance and Motion (Recommended for grades 1-2)	Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Parts 1-3, pp. 6-25 Science Stories, pp. 14-23
5. Investigate ways to change how something is moving (e.g., push, pull).	Balance and Motion (Recommended for grades 1-2)	Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Parts 1-3, pp. 6-25 Science Stories, pp. 10-23
First Grade Physical Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Classify objects according to the materials they are made of and their physical properties.	Pebbles, Sand and Silt Solids and Liquids	Investigation 1, Parts 3-4, pp. 18-25 Investigation 2, Parts 1-2, pp. 8-17 Science Stories, pp. 3-7 Investigation 1, Parts 1-2, pp. 8-20 Investigation 2, Parts 1-2, pp. 10-20 Investigation 4, Part 3, pp. 23-27 Science Stories, pp. 8-13
2. Investigate that water can change from liquid to solid or solid to liquid	Solids and Liquids	Investigation 4, Science Extension, p. 28 Investigation 4, Math Extension, p. 28

		Science Stories, pp. 14-17
3. Explore and observe that things can be done to materials to change their properties (e.g., heating, freezing, mixing, cutting, wetting, dissolving, bending, exposing to light).	Pebbles, Sand and Silt Solids and Liquids	Investigation 1, Parts 2-3, pp. 15-21 Science Stories, pp. 8-11 Investigation 4, Parts 1-2, pp. 8-22
4. Explore changes that greatly change the properties of an object (e.g., burning paper) and changes that leave the properties largely unchanged (e.g., tearing paper).	Solids and Liquids Pebbles, Sand and Silt	Investigation 4, Parts 1-2, pp. 8-22 Science Stories, pp. 14-23 Investigation 1, Part 2, pp. 13-17
5. Explore the effects some objects have on others even when the two objects might not touch (e.g., magnets).	Balance and Motion Solids and Liquids	Science Stories, pp. 18-21 Investigation 3, Science Extension, p. 31
6. Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop.	Balance and Motion	Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Parts 1-3, pp. 6-25 Science Stories, pp. 14-23 FOSS Web, Activity: Roller Coasters
7. Explore how energy makes things work (e.g., batteries in a toy, electricity turning fan blades).	Balance and Motion	Science Stories, pp. 24-25
8. Recognize that the Sun is an energy source that warms the land, air and water.	Air and Weather	Investigation 2, Part 2, pp. 14-19 Science Stories, p. 21
9. Describe that energy can be obtained from many sources in many ways (e.g., food, gasoline, electricity or batteries).		

Second Grade Physical Science

<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explore how things make sound.	Balance and Motion Physics of Sound Recommended for grades 3-4)	Science Stories, pp. 32-35 Investigation 1, Parts 2, 4, pp. 12-16, 25-29 Investigation 2, Parts 1-2, pp. 10-19
2. Explore and describe sounds produced by vibrating objects.	Physics of Sound (Recommended for Grades 3-4)	Investigation 1, Part 4, pp. 25-29 Investigation 2, Parts 1-2, 4, pp. 10-19, 23-24 Investigation 4, Parts 1, 3, pp. 10-15, 19-20 Science Stories, pp. 11-13, 15-16
3. Explore with flashlights and shadows that light travels in a straight line until it strikes an object.	Ideas and Inventions	Investigation 4, Part 1-2, pp. 8-17 Science Stories, pp. 23-26

Benchmarks (grades 3-5)

By the end of grade 5:

- A. Compare the characteristics of simple physical and chemical changes.
- B. Identify and describe the physical properties of matter in its various states.
- C. Describe the forces that directly affect objects and their motion.
- D. Summarize the way changes in temperature can be produced and thermal energy transferred.
- E. Trace how electrical energy flows through a simple electrical circuit and describe how the electrical energy can produce thermal energy, light, sound and magnetic forces.
- F. Describe the properties of light and sound energy.

Third Grade Physical Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe an objects position by locating it relative to another object or the background.	Measurement Water Balance and Motion (Recommended for grades 1-2)	Investigation 4, Parts1-2, pp. 8-17 Investigation 1, Part 3, pp. 19-23 Investigation 2, Parts 1-2, pp. 8-18 Investigation 1, Parts 1-4, pp. 8-28 Investigation 3, Parts 1-3, pp. 6-25
2. Describe an objects motion by tracing and measuring its position over time.	Water Measurement Balance and Motion (Recommended for grades 1-2)	Investigation 2, Parts 1-2, pp. 8-18 Investigation 4, Part 2, pp. 14-17 Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Parts -1-3, pp. 6-25
3. Identify contact/noncontact forces that affect motion of an object (e.g., gravity, magnetism, collision).	Water Measurement Balance and Motion (Recommended for grades 1-2) Magnetism and Electricity	Investigation 1, Part 3, pp. 19-23 Investigation 2, Parts1-2, pp. 8-18 Investigation 4, Parts 1-2, pp. 8-17 Investigation 3, Parts 2-3, pp. 12-25 Science Stories, pp. 10-13 Investigation 1, Part 1, pp. 8-17 Science Stories, pp. 1-11
4. Predict the changes when an object experiences a force (e.g., a push or pull, weight, friction).	Balance and Motion (Recommended for grades 1-2)	Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Part 2, pp. 12-18 Science Stories, pp. 10-13, 18-23
Fourth Grade Physical Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Identify characteristics of a simple physical change (e.g., heating or cooling can change water from one state to another and the	Water	Investigation 2, Parts 1-3, pp. 8-24 Investigation 2, Science Extension, p. 25 Investigation 3, Parts -14, pp. 8-26

change is reversible).	Matter and Energy	Science Stories, pp. 8-16 Investigation 4, Part 2, pp. 181-192 Science Resources, pp. 54-56
2. Identify characteristics of a simple chemical change. When a new material is made by combining two or more materials, it has chemical properties that are different from the original materials (e.g., burning paper, vinegar and baking soda).	Mixtures and Solutions (Recommended for grades 5-6) Matter and Energy	Investigation 4, Parts 1-3, pp. 8-24 Investigation 4, Part 3, pp. 192-203 Science Resources, pp. 60-62
3. Describe objects by the properties of the materials from which they are made and that these properties can be used to separate or sort a group of objects (e.g., paper, glass, plastic, metal).	Magnetism and Electricity Matter and Energy	Investigation 1, Part 1, pp. 8-16 Investigation 2, Part 3, pp. 20-25 Investigation 3, Part 1, pp. 129-138 Science Resources, pp. 39-42
4. Explain that matter has different states (e.g., solid, liquid and gas) and that each state has distinct physical properties.	Water Matter and Energy	Investigation 2, Part 3, pp. 19-24 Investigation 3, Parts 1, 4, pp. 8-11, 21-26 Science Stories, pp. 8-9, 13 Investigation 3, Part 1, pp. 129-138 Investigation 4, Part 3, pp. 193-203 Science Resources, pp. 39-42
5. Compare ways the temperature of an object can be changed (e.g., rubbing, heating, bending of metal).	Water Measurement Matter and Energy	Investigation 2, Parts 1, 3, pp. 8-13, 19-24 Investigation 4, Part 2, pp. 14-17 Investigation 1, Part 1, pp. 50-62
Fifth Grade Physical Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Define temperature as the measure of thermal energy and describe the way it is measured.	Solar Energy	Investigation 2, Parts 1-2, pp. 8-24
2. Trace how thermal energy can transfer from one object to another by conduction.	Solar Energy	Investigation 3, Science Extension, p. 27
3. Describe that electrical current in a circuit can produce thermal energy, light, sound and/or magnetic forces.	Magnetism and Electricity (Recommended for grades 3-4)	Investigation 2, Part 1, pp. 8-13 Investigation 3, Parts 1-2, pp. 10-21 Investigation 4, Part 1, pp. 8-13 Investigation 5, Parts 1-2, pp. 8-20 Science Stories, pp. 16-19, 28-33
4. Trace how electrical current travels by creating a simple	Magnetism and Electricity (Recommended for grades 3-4)	Investigation 2, Part 1, pp. 8-13 Investigation 3, Parts 10-26

electric circuit that will light a bulb.		
5. Explore and summarize observations of the transmission, bending (refraction) and reflection of light.	Ideas and Inventions (Recommended for grades 3-4) Matter and Energy (recommended for grades 3-4)	Investigation 4, Parts 1-3, pp. 8-21 Investigation 2, Part 1, pp.93-102
6. Describe and summarize observations of the transmission, reflection, and absorption of sound.	Physics of Sound (Recommended for grades 3-4)	Investigation 3, Parts 1-2, pp. 8-19 Investigation 3, Science Extension, pp. 22-23 Science Stories, pp. 19-21
7. Describe that changing the rate of vibration can vary the pitch of a sound.	Physics of Sound (Recommended for grades 3-4)	Investigation 2, Parts 1-3, pp. 8-24 Investigation 3, Science Extension, p. 28 Science Stories, pp. 11-13

Benchmarks (Grades 6-8)

By the end of Grade 8:

- A. Relate uses, properties and chemical processes to the behavior and/or arrangement of the small particles that compose matter.
- B. In simple cases, describe the motion of objects and conceptually describe the effects of forces on an object.
- C. Describe renewable and nonrenewable sources of energy (e.g., solar, wind, fossil fuels, biomass, hydroelectricity, geothermal and nuclear energy) and the management of these sources.
- D. Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant.

Sixth Grade Physical Science		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that equal volumes of different substances usually have different masses.	Mixtures and Solutions Chemical Interactions	Investigation 3, Parts 1-3, pp. 8-24 Investigation 3, Science Extension, pp. 27-28 Investigation 8, Parts 2-3, pp. 256-268 Resources pp. 54-57
2. Describe that in a chemical change new substances are formed with different properties than the original substance (e.g., rusting, burning).	Mixtures and Solutions Food and Nutrition Chemical Interactions	Investigation 4, Parts 1-3, pp. 8-24 Investigation 3, Part 1, pp. 8-15 Investigation 1, Part 2, pp. 46-58 Investigation 9, Parts 1-4, pp. 280-312 Investigation 10, Parts 1-2, pp. 323-336 Resources, pp. 63-68, 73-78
3. Describe that in a physical change (e.g., state, shape, size) the chemical properties of a substance remain unchanged.	Mixtures and Solutions Chemical Interactions	Investigation 1, Parts 2-3, pp. 16-24 Investigation 1, Part 2, pp. 45-58 Investigation 6, Part 1, pp. 178-187 Investigation 7, Parts 1-5, pp. 204, 234 Resources, pp.38-48, 49-53

4. Describe that chemical and physical changes occur all around us (e.g., in the human body, cooking, industry).	Mixtures and Solutions Chemical Interactions	Science Stories, pp. 18-19, 23 Investigation 7, Parts 1, 4, pp. 204-210, 222-228 Investigation 9, Part 4, pp. 308-312 Investigation 10, Part 2, pp. 330-336 Resources, pp. 38-48, 49-53, 73-77
5. Explain that the energy found in nonrenewable resources such as fossil fuels (e.g., oil, coal, natural gas) originally came from the Sun and may renew slowly over millions of years.		
6. Explain that energy derived from renewable resources such as wind and water is assumed to be available indefinitely.	Solar Energy	Science Stories, pp. 38-39
7. Describe how electric energy can be produced from a variety of sources (e.g., Sun, wind, coal).	Solar Energy Electronics	Science Stories, pp. 29-31, 35-37 Resources, pp. 12-13
8. Describe how renewable and nonrenewable energy resources can be managed (e.g., fossil fuels, trees, water).	Solar Energy Environments Water Planet	Investigation 3, Home School Connection Science Stories, pp. 22-24 Science Stories, pp. 36-37, 39-41 Science Resources, pp. 65-66

Seventh Grade Physical Science

<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Investigate how matter can change forms but the total amount of matter remains the same.	Mixtures and Solutions Chemical Interactions	Investigation 1, Part 2, pp. 16-20 Investigation 8, Part 2, pp. 256-262 Resources, pp. 69-72
2. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion.	Force and Motion Chemical Interactions	FOSS provides the opportunity to address this indicator. See below: Investigation 1, Part 1, pp. 47-56 Investigation 2, Part 3, pp. 89-99 Investigation 5, Parts 1-2, pp. 169-186 Resources, pp. 32-33, 62-64, Investigation 4, Parts 1-3, pp. 122-141 Resources, pp. 23-27, 32-41 CD, Particles in Solid, Liquid and Gas
3. Identify different forms of energy (e.g., electrical, mechanical, chemical, thermal, nuclear, radiant and acoustic).	Electronics Populations and Ecosystems Chemical Interactions	Investigation 1, Parts 1-2, pp. 55-65 Resources, pp. 12-13 CD, Static Electricity Investigation 5, Part 1, pp. 142-150 Resource, pp. 14-16 Investigation 4, Parts 1-3, pp. 122-141 Resources, pp. 23-27, 32-41, 73-77

		CD, Particles in Solid, Liquid and Gas
4. Explain how energy can change forms but the total amount of energy remains constant.		
5. Trace energy transformation in a simple closed system (e.g., a flashlight).	Electronics	Investigation 1, Parts 1-2, pp. 55-65 Resources, pp. 1-2
Eighth Grade Physical Science		
<i>DSM Module Title</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe how change in the position (motion) of an object is always judged and described in comparison to a reference point.	Force and Motion	Investigation 1, Parts 1-3, 47-66 Resources, pp. 3-6
2. Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.	Force and Motion	Investigation 1, Parts 1-3, pp. 47-66 Investigation 2, Parts 1-3, pp. 78-99 Investigation 3, Parts 1-3, pp. 111-127 Resources, pp. 3-6, 7-9, 17-19, 27-33
3. Explain that an unbalanced force acting on an object changes that object's speed and / or direction.	Force and Motion	Investigation 6, Parts 1-4, pp. 218-245 Investigation 7, Parts 1-2, pp. 256-266 Investigation 8, Part 1, pp. 284-293 Resources, pp. 62-66, 67-74 CD, Understanding Car Crashes
4. Demonstrate that waves transfer energy.		
5. Demonstrate that vibrations in materials may produce waves that spread away from the source in all directions (e.g., earthquake waves, sound waves).		

Science and Technology

Benchmarks

By the end of the K-2 program:

- A. Explain why people, when building or making something, need to determine what it will be made of and how it will affect other people and the environment.
- B. Explain that to construct something requires planning, communication, problem solving and tools.

Kindergarten Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explore that objects can be sorted as “natural” or “man-made”.	Animals Two by Two	FOSS provides the opportunity to address this indicator. See examples below: Investigations 1-3, All Parts Science Stories, pp. 2-24
	Trees	Investigations 1-3, All Parts Science Stories, pp. 2-24
	Wood and Paper	Investigations 1-5, All Parts Science Stories, pp. 2-24
2. Explore that some materials can be used over and over again (e.g., plastic or glass containers, cardboard boxes and tubes).	Wood and Paper	Investigation 2, Parts 3-4, pp. 16-24 Investigation 4, Parts 1-2, pp. 8-18
3. Explore that each kind of tool has an intended use, which can be helpful or harmful (e.g., scissors can be used to cut paper but they can also hurt you).	Fabric	Investigation 1, Part 6, pp. 29-33
First Grade Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explore that some kinds of materials are better suited than others for making something new (e.g., building materials used in the Three Little Pigs).	Solids and Liquids	Investigation 1, Part 3, pp. 21-24
	Pebbles, Sand and Silt	Investigation 3, Parts 1, 3-5, pp. 8-11, 16-29 Science Stories, pp. 14-17
2. Explain that when trying to build something or get something to work better, it helps to follow directions and ask someone who has done it before.	Balance and Motion	FOSS provides the opportunity to address this indicator. See examples below: Investigation 2, Parts 1-3, pp. 8-25
	Air and Weather	Investigation 3, Parts 3, 5, pp. 17-21, 28-33
3. Identify some materials that can be saved for community recycling projects (e.g., newspapers, glass and aluminum).		
4. Explore ways people use energy to cook their food and warm their homes (e.g., wood, coal, natural gas, electricity).		
5. Identify how people can save energy by turning things off when		

they are not using them (e.g., lights and motors).		
6. Investigate that tools are used to help make things and some things cannot be made without tools.	Balance and Motion	Investigation 2, Parts 1, 3, pp. 8-13, 20-25
	Air and Weather	Investigation 3, Parts 3, 5, pp. 17-21, 28-33
7. Explore that several steps are usually needed to make things (e.g., building with blocks).	Balance and Motion	Investigation 2, Parts 1, 3, pp. 8-13, 20-25
	Air and Weather	Investigation 3, Parts 3, 5, pp. 17-21, 28-33
8. Investigate that when parts are put together they can do things that they could not do by themselves (e.g., blocks, gears and wheels).	Balance and Motion	Investigation 2, Parts 1, 3, pp. 8-13, 20-25
	Air and Weather	Investigation 3, Parts 3, 5, pp. 17-21, 28-33

Second Grade Science and Technology

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that developing and using technology involves benefits and risks.	Pebbles, Sand and Silt Air and Weather	FOSS provides the opportunity to address this indicator. See examples below: Science Stories, pp. 16-19 Science Stories, p. 15
2. Investigate why people make new products or invent new ways to meet their individual wants and needs.	Ideas and Inventions (recommended for grades 3-4)	This indicator is heavily explored in this module.
3. Predict how building or trying something new might affect other people and the environment.		
4. Communicate orally, pictorially, or in written form the design process used to make something.	Solids and Liquids Balance and Motion	Investigation 1, Part 4, pp. 21-24 Investigation 1, Part 4, pp. 24-28 Investigation 2, Parts 1-3, pp. 8-13, 20-25

Benchmarks (Grades 3-5)

By the end of the 3-5 program:

- A. Describe how technology affects human life.
- B. Describe and illustrate the design process.

Third Grade Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe how technology can extend human abilities (e.g., to move things, to extend senses).	Human Body Water Physics of Sound Ideas and Inventions Magnetism and Electricity Sun, Moon and Stars	Science Stories, pp. 5-8 Investigation 4, Part 2, pp. 14-18 Investigation 4, Language Extension, p. 21 Investigation 4, Social Studies Extension, p. 23 Science Stories, p. 32-35 Investigation 2, Parts 1-2, pp. 8-19 Science Stories, p. 38 Investigation 5, Part 1, pp. 8-14 Science Stories, pp. 34-37 Science Resources, pp. 40-43

	Matter and Energy	Investigation 3, Parts 2-3, pp. 139-160
2. Describe ways that using technology can have helpful and/or harmful results.	Water	Investigation 4, Part 2, pp. 14-18 Science Stories, pp. 10-11, 22-23
	Structures of Life	Science Stories, pp. 10-11
	Physics of Sound	Investigation 4, Language Extension, p. 21 Investigation 4, Social Studies Extension, p. 23 Science Stories, p. 32-35
	Magnetism and Electricity	Investigation 5, Part 1, pp. 8-14 Science Stories, pp. 16-20, 34-37
	Ideas and Inventions	Science Stories, pp. 17-22
	Matter and Energy	Science Resources, pp. 2-3, 6, 13
3. Investigate ways that the results of technology may affect the individual, family and community.	Structures of Life	Science Stories, pp. 10-16
	Water	Science Stories, pp. 17-23
	Magnetism and Electricity	Science Stories, pp. 12-13, 16-19, 28-37
	Physics of Sound	Science Stories, pp. 32-35
4. Use a simple design process to solve a problem (e.g., identify a problem, identify possible solutions, design a solution).	Ideas and Inventions	Science Stories, pp. 17-22
	Magnetism and Electricity	Investigation 4, Parts 2-3, pp. 14-22
	Water	Investigation 4, Part 2, pp. 14-18
5. Describe possible solutions to a design problem (e.g., how to hold down paper in the wind).	Ideas and Inventions	Investigation 2, Part 3, pp. 20-22 Investigation 3, Part 3, pp. 18-21 Investigation 4, Part 3, pp. 18-21
	Magnetism and Electricity	Investigation 4, Parts 2-3, pp. 14-22
	Water	Investigation 4, Part 2, pp. 14-18

Fourth Grade Science and Technology

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain how technology from different areas (e.g., transportation, communication, nutrition, healthcare, agriculture, entertainment, manufacturing) has improved human lives.	Ideas and Inventions	Science Stories, pp. 1-3, 18-22
	Magnetism and Electricity	Investigation 2, Science Extension, p. 32 Investigation 3, Science Extension, pp. 27-28 Science Stories, pp. 12-19, 28-37
	Structures of Life	Science Stories, pp. 10-11
	Water	Science Stories, pp. 17-23
	Human Body	Science Stories, pp. 32-35

	Matter and Energy	Science Resources, pp. 2-3, 6, 11
2. Investigate how technology and inventions change to meet peoples' needs and wants.	Ideas and Inventions	Science Stories, pp. 10, 17, 21
	Structures of Life	Science Stories, pp. 10-11
	Magnetism and Electricity	Investigation 1, Social Studies Extension, p. 36 Investigation 2, Social Studies Extension, p. 32 Science Stories, pp. 12-20, 28-33
	Human Body	Science Stories, pp. 32-35
3. Describe, illustrate and evaluate the design process used to solve a problem.	FOSS provides the opportunity to address this indicator. See below:	
	Magnetism and Electricity	Investigation 4, Parts 2-3, pp. 14-22
	Water	Investigation 4, Part 2, pp. 14-18
	Ideas and Inventions	Investigation 2, Part 3, pp. 20-22 Investigation 3, Part 3, pp. 18-21 Investigation 4, Part 3, pp. 18-21
Fifth Grade Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Investigate positive and negative impacts of human activity and technology on the environment.	Environments	Science Stories, pp. 9-17, 27-37, 43-46
	Landforms	Science Stories, pp. 15-21
	Models and Designs	Science Stories, pp. 25-27
	Matter and Energy	Science Resources, pp. 65-66
2. Revise an existing design used to solve a problem based on peer review.	Models and Designs	FOSS provides the opportunity for teachers to address this indicator. See below: Investigation 1, Parts 1-2, pp. 8-21 Investigation 2, Parts 1-2, pp. 8-21 Investigation 3, Parts 1-2, pp. 8-19 Investigation 4, Part 1, pp. 6-10
	Landforms	Science Stories, pp. 15-21
3. Explain how the solution to one problem may create other problems.	Models and Designs	Science Stories, pp. 29-36

Benchmarks (Grades 6-8)

By the end of the 6-8 program:

- A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life.
- B. Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety, aesthetics).

Sixth Grade Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain how technology	Models and Designs	Science Stories, pp. 25-28, 44-47

influences the quality of life.	Solar Energy Water Planet Electronics Planetary Science Human Brain and Senses	Science Stories, pp. 16-17, 29-37 Science Resources, pp. 2-3, 6, 11 Investigation 4, Part 1-2, pp. 143-151 Resources, pp. 1-2, 18-21, 23-25, 34-36 Resources, pp. 74-77, 90-95 Resources, p. 49
2. Explain how decisions about the use of products and systems can result in desirable or undesirable consequences (e.g., social and environmental).	Models and Designs Solar Energy Planetary Science Electronics Force and Motion	Science Stories, pp. 33-36, 44-47 Investigation 4, Parts 2-3, pp. 20-28 Science Stories, pp. 32-33, 35-39 Investigation 7, Part 1-3, pp. 218-231 Resources, 74-77 Resources, pp. 18-21, 34-36 Resources, pp. 70-71
3. Describe how automation (e.g., robots) has changed manufacturing including manual labor being replaced by highly-skilled jobs.	Models and Designs Planetary Science	Science Stories, pp. 33-36, 44-47 Resources, pp. 90-96
4. Explain how the usefulness of manufactured parts of an object depend on how well their properties allow them to fit and interact with other materials.	Models and Designs Electronics	Investigation 1, Parts 1-2, pp. 8-21 Investigation 4, Parts 1-3, pp. 6-20 Investigation 4, Part 1, pp. 143-148
5. Design and build a product or create a solution to a problem given one constraint (e.g., limits of cost and time for design and production, supply of materials and environmental effects).	Models and Designs Solar Energy Force and Motion Planetary Science	Investigation 1, Part 2, pp. 18-21 Investigation 2, Parts 1-2, pp. 8-21 Investigation 3, Parts 1-3, pp. 8-23 Investigation 4, Parts 1-3, pp. 6-20 Investigation 4, Parts 1-4, pp. 8-33 Investigation 8, Part 2, pp. 294-301 Investigation 2, Extending the Experience, p. 78
Seventh Grade Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain how needs, attitudes and values influence the direction of technological development in various cultures.	Planetary Science	Investigation 2, Part 1, pp. 64-70 Investigation 7, Part 1, pp. 218-221 Resources, pp. 47-51, 74-82, 90-95
2. Describe how decisions to develop and use technologies often put environmental and economic concerns in direct competition with each other.	Planetary Science Weather and Water	Investigation 7, Part 1, pp. 218-221 Resources, 74-77 Investigation 9, Part 4, pp. 316-318 Resources, pp. 63-66

	Populations and Ecosystems	Investigation 7, pp. 210-217 Resources, pp. 31-41
3. Recognize that science can only answer some questions and technology can only solve some human problems.		FOSS provides the opportunity to address this indicator through its investigations and resources.
4. Design and build a product or create a solution to a problem given two constraints (e.g., limits of cost and time for design and production, supply of materials and environmental effects).	Force and Motion	FOSS provides the opportunity to address this indicator. See below: Investigation 8, Part 2, pp. 294-301
Eighth Grade Science and Technology		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.	Populations and Ecosystems Earth History Force and Motion Weather and Water Chemical Interactions	Resources, pp. 46-55, 58-61 Resources, pp. 83-87 Resources, pp. 50-52, 62-66 Resources, p. 38 Resources, pp. 7-8, 80-85
2. Examine how choices regarding the use of technology are influenced by constraints caused by various unavoidable factors (e.g., geographic location, limited resources, social, political and economic considerations).	Populations and Ecosystems Planetary Science	Investigation 7, pp. 210-217 Resources, pp. 30-41 Investigation 7, Part 1, pp. 218-221 Resources, pp. 74-77
3. Design and build a product or create a solution to a problem given more than two constraints (e.g., limits of cost and time for design and production, supply of materials and environmental effects).	Force and Motion	FOSS provides the opportunity to address this indicator. See below: Investigation 8, Part 2, pp. 294-301
4. Evaluate overall effectiveness of a product design or solution.	Force and Motion	FOSS provides the opportunity to address this indicator. See below: Investigation 8, Part 2, pp. 294-301

Scientific Inquiry

Benchmarks (grades K-2)

By the end of the K-2 program:

- A. Ask a testable question.
- B. Design and conduct a simple investigation to explore a question.
- C. Gather and communicate information from careful observations and simple investigation through a variety of methods.

Kindergarten Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Ask “what if” questions.	<p>All modules</p> <p>Trees</p> <p>Wood and Paper</p>	<p>In the FOSS Investigations, students are encouraged to ask questions. The teacher records student questions on the “What We Learn Chart” at the end of each lesson.</p> <p>Investigation 1, Part 2, pp. 15-19</p> <p>Science Stories, pp. 9-12</p>
2. Explore and pursue student-generated “what if” questions.	All Modules	In the FOSS Investigations, students are encouraged to ask questions. The teacher records student questions on the “What We Learn Chart” at the end of each lesson. The teacher can encourage students to explore these questions.
3. Use appropriate safety procedures when completing scientific investigations.	<p>Fabric</p> <p>Wood and Paper</p> <p>Trees</p>	<p>All FOSS Modules contain safety information for teachers and students. For the teachers, safety precautions are printed within the context of the lesson instructions. Examples include:</p> <p>Investigation 1, p. 32</p> <p>Investigation 5, p.23</p> <p>Investigation 3, p. 13</p>
4. Use the five senses to make observations about the natural world.	<p>Fabric</p> <p>Trees</p> <p>Wood and Paper</p>	<p>Investigation 1, Part 1, pp. 6-11</p> <p>Investigation 1, Part 1, pp. 7-14</p> <p>Science Stories, pp. 9-12</p>
5. Draw pictures that correctly portray features of the item being described.	<p>Animals Two by Two</p> <p>Trees</p>	<p>Students keep records of observations and these often include pictures.</p> <p>Investigation 1, Part 1, pp. 10-16</p> <p>Investigation 4, Art Extension, p. 24</p> <p>Investigation 1, Part 1, pp. 7-14</p> <p>Investigation 3, Part 2, pp. 12-14</p>
6. Recognize that numbers can be used to count a collection of things.	<p>Animals Two by Two</p> <p>Fabric</p> <p>Trees</p>	<p>Investigation 2, Math Extension, p. 26</p> <p>Investigation 1, Math Extension, p. 35</p> <p>Investigation 1, Home School Connection, p. 40</p> <p>Investigation 3, Part 1, pp. 10-11</p>

7. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers and other appropriate tools).	Animals Two by Two Fabric Wood and Paper	Investigation 4, Part 1, pp. 8-11 Investigation 1, Part 4, pp. 20-22 Investigation 2, Part 1, pp. 7-11 Investigation 1, Part 3, pp. 20-23 Investigation 2, Part 1, pp. 8-11 Investigation 3, Part 4, pp. 22-25
8. Measure the lengths of objects using non-standard methods of measurement (e.g., teddy bear counters, pennies).	Animals Two by Two Trees	Investigation 3, Math Extension, p. 21 Investigation 1, Part 2, 7, pp. 15-19, 31-34 Investigation 1, Math Extension, p. 39
9. Make pictographs and use them to describe observations and draw conclusions	Fabric Trees	Investigation 1, Math Extension, p. 35 Investigation 2, Part 4, pp. 22-25 Investigation 2, Math Extension, p. 29
10. Make new observations when people give different descriptions for the same thing.		The inquiry approach to FOSS investigations would encourage this indicator.
First Grade Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Ask “what happens when” questions.	All Modules New Plants Solids and Liquids Plants and Animals	In the FOSS Investigations, students are encouraged to ask questions. The teacher records student questions on the “What We Learn Chart” at the end of each lesson. Investigation 3, Part 3, pp. 20-28 Investigation 4, Part 3, pp. 23-27 Investigation 1, Part 2, pp. 58-62 Investigation 2, Part 3, pp. 104-108
2. Explore and pursue student-generated “what happens when” questions	All Modules	In the FOSS Investigations, students are encouraged to ask questions. The teacher records student questions on the “What We Learn Chart” at the end of each lesson. The teacher can encourage students to explore these questions.
3. Use appropriate safety procedures when completing scientific investigations.	Balance and Motion Pebbles, Sand and Silt Air and Weather	All FOSS Modules contain safety information for teachers and students. For the teachers, safety precautions are printed within the context of the lesson instructions.. Examples include: Investigation 2, p. 15 Investigation 4, p. 16 Investigation 1, p. 24
4. Work in a small group to complete an investigation and then share findings with others.	Balance and Motion New Plants Solids and Liquids	FOSS modules encourage and promote cooperative learning strategies. See below: Investigation 1, Part 3, pp. 19-23 Investigation 3, Part 1, pp. 8-13 Investigation 3, Part 1, pp. 8-13

	Pebbles, Sand and Silt	Investigation 1, Part 3, pp. 18-21
	Plants and Animals	Investigation 1, Parts 1-2, pp. 47-62
5. Create individual conclusions about group findings.		Students are encouraged to work cooperatively but to form their own conclusions in investigations. See below:
	Balance and Motion	Investigation 3, Part 1, pp. 6-12
	Solids and Liquids	Investigation 4, Part 3, pp. 23-27
	Plants and Animals	Investigation 1, Part 2, pp. 50-62
6. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, timers, simple balances and other appropriate tools).	Air and Weather	Investigation 1, Part 2, pp. 13-16 investigation 2, Parts 2-4, pp. 14-27 Investigation 3, Parts 2, 4, pp. 12-16, 22-27
	Insects	Investigation 1, Parts 1-2, pp. 8-21 Investigation 2, Parts 1, 3, pp. 8-13, 20-24
	Pebbles, Sand and Silt	Investigation 1, Part 2, pp. 13-17 Investigation 4, Part 2, pp. 15-18
	Solids and Liquids	Investigation 3, Math Extension, pp. 28-29
	Insects and Plants	Investigation 1, Parts 1-3, pp. 52-75 Investigation 3, Parts 1-3, pp. 129-151
7. Make estimates to compare familiar lengths, weights and time intervals.	New Plants	Investigation 1, Math Extension, p. 31
	Plants and Animals	Investigation 1, Math Extension, p. 116
8. Use oral, written and pictorial representation to communicate work.	Air and Weather	Investigation 1, Part 4, pp. 21-26 Investigation 2, Part 1, pp. 8-13 Investigation 4, Parts 1-3, pp. 8-24
	Insects	Investigation 1, Part 1-2, pp. 8-21 Investigation 2, Part 2, pp. 14-19 Investigation 4, Parts 2, 4, pp. 14-18, 23-27
	New Plants	Investigation 1, Parts 1, 3, pp. 8-12, 23-30 Investigation 2, Part 1, pp. 8-14
	Pebbles, Sand and Silt	Investigation 1, Parts 3, 5, pp. 18-21, 26-29 Investigation 2, Part 3, pp. 18-23
	Solids and Liquids	Investigation 1, Part 1, pp. 8-16 Investigation 2, Part 3, pp. 21-27
	Insects and Plants	Investigation 1, Parts 1-3, pp. 52-75 Investigation 4, Parts 2, 4, pp. 170-174, 179-186
	Plants and Animals	Investigation 1, Part 1, pp. 47-57
9. Describe things as accurately as possible and compare with the observations of others.		FOSS investigations encourage accurate descriptions and comparing with the observations of others. See examples below:
	Air and Weather	Investigation 1, Parts 5-6, pp. 27-38 Investigation 2, Part 3, pp. 20-23

	New Plants	Investigation 3, Part 1, pp. 8-13
	Solids and Liquids	Investigation 4, Part 1, pp. 7-16
	Plants and Animals	Investigation 3, Parts 1-2, pp. 120-134 Investigation 4, Parts 1-2, pp. 151-163
	Insets and Plants	Investigation 1, Parts 1-3, pp. 52-75
Second Grade Scientific Inquiry		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Ask “how can I/we” questions.	All Modules	In the FOSS Investigations, students are encouraged to ask questions. The teacher records student questions on the “What We Learn Chart” at the end of each lesson.
2. Ask “how do you know” questions (not “why” questions) in appropriate situations and attempt to give reasonable answers when others ask questions.	All Modules	The nature and design of the FOSS Program is to provide hands-on experiences that stimulate students’ questions, do the inquiry then make inferences from the results. Students use this evidence to respond to “how do you know” questions.
3. Explore and pursue student-generated “how” questions.	All Modules	In the FOSS Investigations, students are encouraged to ask questions. The teacher records student questions on the “What We Learn Chart” at the end of each lesson. The teacher can encourage students to explore these questions.
4. Use appropriate safety procedures when completing scientific investigations.	Balance and Motion Pebbles, Sand and Silt Air and Weather	All FOSS Modules contain safety information for teachers and students. For the teachers, safety precautions are printed within the context of the lesson instructions. Examples include: Investigation 2, p. 15 Investigation 4, p. 16 Investigation 1, p. 24
5. Use evidence to develop explanations of scientific investigations. (What do you think? How do you know?)	Balance and Motion New Plants Solids and Liquids Insects and Plants Plants and Animals	Investigation 1, Part 1, pp. 8-13 Investigation 3, Part 1, pp. 6-12 Investigation 2, Part 2, pp. 15-19 Investigation 3, Part 3, pp. 19-26 Investigation 4, Part 3, pp. 23-27 Investigation 2, Part 3, pp. 105-115 Investigation 1, Part 2, pp. 58-62
6. Recognize that explanations are generated in response to observations, events and phenomena.	Balance and Motion New Plants	FOSS provides opportunities for students to develop explanations through investigations. See below for examples. Investigation 1, Part 1, pp. 8-13 Investigation 3, Part 1, pp. 6-12 Investigation 2, Part 2, pp. 15-19 Investigation 3, Part 3, pp. 19-26

	Solids and Liquids	Investigation 4, Part 3, pp. 23-27
	Plants and Animals	Investigation 1, Part 2, pp. 58-62 Investigation 2, Part 3, pp. 104-108
7. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, non-breakable thermometers, timers, rulers, balances, calculators and other appropriate tools).	Air and Weather	Investigation 1, Part 2, pp. 13-16 investigation 2, Parts 2-4, pp. 14-27 Investigation 3, Parts 2, 4, pp. 12-16, 22-27
	Insects	Investigation 1, Parts 1-2, pp. 8-21 Investigation 2, Parts 1, 3, pp. 8-13, 20-24
	Pebbles, Sand and Silt	Investigation 1, Part 2, pp. 13-17 Investigation 4, Part 2, pp. 15-18
	Solids and Liquids	Investigation 3, Math Extension, pp. 28-29
	Insects and Plants	Investigation 1, Parts 1-3, pp. 52-75 Investigation 3, Parts 1-3, pp. 129-151
8. Measure properties of objects using tools such as rulers, balances and thermometers.	Air and Weather	Investigation 2, Parts 2, 4, pp. 14-19, 24-27
	New Plants	Investigation 1, Part 3, pp. 23-30 Investigation 2, Part 1, pp. 8-13 Investigation 4, Part 1, pp. 7-12
9. Use whole numbers to order, count, identify, measure and describe things and experiences.	Air and Weather	Investigation 1, Math Extension, p. 39 Investigation 2, Part 2, pp. 14-19
	Insects	Investigation 1, Math Extension, p. 26 Investigation 2, Math Extension, p. 26 Investigation 4, Part 4, pp. 23-27
	New Plants	Investigation 1, Math Extension, p. 31 Investigation 2, Math Extension, p. 29 Investigation 4, Math Extension, p. 20
	Insects and Plants	Investigation 1, Math Extension, p. 77 Investigation 2, Math Extension, p. 109
	Plants and Animals	Investigation 1, Math Extension, p. 116 Investigation 4, Math Extension, p. 167
10. Share explanations with others to provide opportunities to ask questions, examine evidence and suggest alternative explanations	All Modules	FOSS provides the opportunity to share explanations and observations in each of its investigations. See for example:
	Air and Weather	Investigation 1, Part 5, pp. 27-33
	Solids and Liquids	Investigation 4, Part 1, pp. 7-16
	Plants and Animals	Investigation 1, Part 2, pp. 58-62

Benchmarks (Grades 3-5)

By the end of the 3-5 program:

- A. A. Use appropriate instruments safely to observe, measure and collect data when conducting a scientific investigation.
- B. Organize and evaluate observations, measurements and other data to formulate inferences and conclusions.
- C. Develop, design and safely conduct scientific investigations and communicate the results.

Third Grade Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Select the appropriate tools and use relevant safety procedures to measure and record length and weight in metric and English units.	Earth Materials	Investigation 1, Parts 1-2, pp. 8-23 Investigation 1, Math Extension, p. 31
	Measurement	Investigation 1, Parts 1-3, pp. 8-24 Investigation 1, Science Extension, p. 27 Investigation 3, Parts 1-3, pp. 8-21 Investigation 4, Part 3, pp. 18-21
	Structures of Life	Investigation 1, Part 3, pp. 28-33 Investigation 3, Math Extension, pp. 31-32 Investigation 4, Part 3, pp. 20-24
	Water	Investigation 1, Math Extension, p. 26 Investigation 3, Part 2, pp. 12-16
	Matter and Energy	Investigation 3, Part 2, pp. 139-150
2. Discuss observations and measurements made by other people.		FOSS investigations include the opportunity for students to discuss observations and measurements in the post-investigation discussions. See examples below:
	Earth Materials	Investigation 1, Parts 1, 3, pp. 8-15, 24-29 Investigation 2, Parts 1-2, pp. 8-21
	Ideas and Inventions	Investigation 2, Part 2, pp. 16-19
	Measurement	Investigation 2, Parts 1, 3, pp. 8-13, 18-21 Investigation 4, Parts 1-2, pp. 8-21
	Physics of Sound	Investigation 1, Part 2, pp. 16-20
	Sun, Moon and Stars	Investigation 1, Parts 1-2, pp. 46-64
	Matter and Energy	Investigation 3, Part 3, pp. 151-160
3. Read and interpret simple tables and graphs produced by self/others.	Earth Materials	Investigation 2, Math Extension, p. 22
	Ideas and Inventions	Investigation 2, Math Extension, p. 23
	Measurement	Investigation 2, Parts 1, 3, pp. 8-13, 18-21 Investigation 4, Parts 1-2, pp. 8-17 Investigation 4, Math Extension, p. 22
	Structures of Life	Investigation 1, Part 1, pp. 8-17
	Magnetism and Electricity	Investigation 1, Part 3, pp. 23-29 Investigation 4, Parts 2-3, pp. 14-22

	Sun, Moon and Stars	Investigation 2, Part 2, pp. 89-100
	Matter and Energy	Investigation 3, Parts 2-3, pp. 139-160
4. Identify and apply science safety procedures.	Human Body Magnetism and Electricity Water Physics of Sound Sun, Moon and Stars	All FOSS Modules contain safety information for teachers and students. For the teachers, safety precautions are printed within the context of the lesson instructions.. Examples include: Investigation 2, p. 11 Investigation 2, p. 9 Investigation 1, p. 9 Investigation 3, p. 10 Investigation 1, pp. 50-51
5. Record and organize observations (e.g., journals, charts, tables).	Earth Materials Human Body Ideas and Inventions Magnetism and Electricity Measurement Structures of Life Water Sun, Moon and Stars Matter and Energy	Investigation 1, Parts 2-3, pp. 16-29 Investigation 2, Parts 1-2, pp. 8-21 Investigation 4, Part 3, pp. 20-24 Investigation 2, Part 1, pp. 8-15 Investigation 3, Part 1, pp. 8-13 Investigation 1, Parts 1, 3, pp. 8-17, 23-29 Investigation 4, Parts 2-3, pp. 14-22 Investigation 1, Part 1, pp. 8-15 Investigation 4, Parts 1-2, pp. 8-17 Investigation 1, Parts 1-3, pp. 8-33 Investigation 3, Parts 2-4, pp. 16-30 Investigation 2, Parts 1-3, pp. 8-24 Investigation 3, Part 2, pp. 12-16 Investigation 2, Part 2, pp. 89-100 Investigation 3, Parts 2-3, pp. 139-160
6. Communicate scientific findings to others through a variety of methods (e.g., pictures, written, oral and recorded observations).	Earth Materials Ideas and Inventions Measurement Physics of Sound Water	FOSS investigations include the opportunity for students to discuss observations and inferences in the post-investigation discussions. See examples below: Investigation 1, Parts 1, 3, pp. 8-15, 24-29 Investigation 2, Parts 1-2, pp. 8-21 Investigation 2, Part 2, pp. 16-19 Investigation 2, Parts 1, 3, pp. 8-13, 18-21 Investigation 4, Parts 1-2, pp. 8-21 Investigation 1, Part 2, pp. 16-20 Investigation 2, Part 3, pp. 19-24

	Sun, Moon and Stars	Investigation 2, Parts 1-2, pp. 79-100
	Matter and Energy	Investigation 4, Part 2, pp. 181-192
Fourth Grade Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Select the appropriate tools and use relevant safety procedures to measure and record length, weight, volume, temperature and area in metric and English units.	Earth Materials	Investigation 1, Parts 1-2, pp. 8-23 Investigation 1, Science Extension, p. 31
	Measurement	Investigation 1, Parts 1-3, pp. 8-24 Investigation 2, Parts 1-3, pp. 8-21 Investigation 3, Parts 1-3, pp. 8-21 Investigation 4, Parts 1-3, pp. 8-21
	Structures of Life	Investigation 1, Part 3, pp. 28-33 Investigation 1, Math Extension, p. 34
	Water	Investigation 1, Math Extension, p. 26 Investigation 2, Part 2, pp. 14-18 Investigation 3, Part 3, pp. 17-20
	Magnetism and Electricity	Investigation 1, Part 3, pp. 23-29
	Matter and Energy	Investigation 3, Parts 2-3, pp. 139-160
2. Analyze a series of events and/or simple daily or seasonal cycles, describe the patterns and infer the next likely occurrence.	Structures of Life	Investigation 2, Part 3, pp. 18-22
	Magnetism and Electricity	Investigation 4, Part 2, pp. 14-18
	Physics of Sound	Investigation 2, Parts 1-3, pp. 8-24
	Sun, Moon and Stars	Investigation 2, Part 2, pp. 89-100
3. Develop, design and conduct safe, simple investigations or experiments to answer questions.	Earth Materials	Students design and conduct investigations in all FOSS modules. In addition, the last investigation of each module is a student choice of project of their choosing. See examples below: Investigation 3, Part 2, pp. 14-19 Investigation 4, Part 2, pp. 14-18
	Human Body	Investigation 4, Parts 1, 3-4, pp. 8-16, 20-29
	Ideas and Inventions	Investigation 2, Part 3, pp. 20-22 Investigation 3, Part 3, pp. 18-21 Investigation 4, Part 4, pp. 22-25
	Physics of Sound	Investigation 4, Part 2, pp. 16-20
	Structures of Life	Investigation 3, Part 4, pp. 24-30 Investigation 4, Part 4, pp. 25-29
	Sun, Moon and Stars	Investigation 1, Part 2, pp. 56-64
	Matter and Energy	Investigation 3, Part 2, pp. 139-150
4. Explain the importance of		FOSS provides the opportunity to address this indicator in investigations that involve

keeping conditions the same in an experiment.	Human Body Magnetism and Electricity Physics of Sound Water	control/variable situations. See below for examples. Investigation 4, Parts 1, 3, pp. 8-16, 20-24 Investigation 4, Parts 2-3, pp. 14-22 Investigation 2, Parts 1-3, pp. 8-24 Investigation 4, Part 1, pp. 8-13
5. Describe how comparisons may not be fair when some conditions are not kept the same between experiments.	Human Body Magnetism and Electricity Physics of Sound Water Matter and Energy	FOSS provides the opportunity to address this indicator in investigations that involve control/variable situations. See below for examples. Investigation 4, Parts 1, 3, pp. 8-16, 20-24 Investigation 4, Parts 2-3, pp. 14-22 Investigation 2, Parts 1-3, pp. 8-24 Investigation 4, Part 1, pp. 8-13 Investigation 3, Part 2, pp. 139-150
6. Formulate instructions and communicate data in a manner that allows others to understand and repeat an investigation or experiment.	Earth Materials Human Body Ideas and Inventions Matter and Energy Physics of Sound Structures of Life	FOSS provides the opportunity to address this indicator if the teacher wishes students to formulate instructions on how their investigation was completed. In addition, the last investigation of each module is a student choice of project of their choosing where communication of procedures is required.. See examples below: Investigation 3, Part 2, pp. 14-19 Investigation 4, Part 2, pp. 14-18 Investigation 4, Parts 1, 3-4, pp. 8-16, 20-29 Investigation 2, Part 3, pp. 20-22 Investigation 3, Part 3, pp. 18-21 Investigation 4, Part 4, pp. 22-25 Investigation 4, Part 2, pp. 181-192 Investigation 4, Part 2, pp. 16-20 Investigation 3, Part 4, pp. 24-30 Investigation 4, Part 4, pp. 25-29
Fifth Grade Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Select and safely use the appropriate tools to collect data when conducting investigations and communicating findings to	Environments Food and Nutrition	Investigation 1, Parts 1-2, pp. 8-22 Investigation 3, Part 1, pp. 8-13 Investigation 1, Parts 1-2, pp. 8-21

<p>others(e.g., thermometers, timers, balances, spring scales, magnifiers, microscopes and other appropriate tools).</p>	<p>Levers and Pulleys</p> <p>Mixtures and Solutions</p> <p>Solar Energy</p> <p>Water Planet</p>	<p>Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Parts 1, 3, pp. 8-15, 21-25</p> <p>Investigation 1, Parts 1-3, pp. 8-28 Investigation 2, Parts 1-3, pp. 8-22 Investigation 3, Part 1, pp. 8-15 Investigation 4, Part 1, pp. 8-13</p> <p>Investigation 1, Parts 1-4, pp. 8-29</p> <p>Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23</p> <p>Investigation 3, Part 1, pp. 125-135</p>
<p>2. Evaluate observations and measurements made by other people and identify reasons for any discrepancies.</p>	<p>Levers and Pulleys</p> <p>Mixtures and Solutions</p> <p>Solar Energy</p> <p>Living Systems</p>	<p>Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data there are opportunities and instances where this indicator can be addresses and reinforced. See examples below:</p> <p>Investigation 1, Parts 1-3, pp. 8-28 Investigation 2, Parts 1-3, pp. 8-22 Investigation 3, Part 1, pp. 8-15 Investigation 4, Part 1, pp. 8-13</p> <p>Investigation 1, Parts 1-4, pp. 8-29</p> <p>Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23</p> <p>Investigation 3, Part 3, pp. 136-141</p>
<p>3. Use evidence and observations to explain and communicate the results of investigations.</p>	<p>Environments</p> <p>Food and Nutrition</p> <p>Landforms</p> <p>Levers and Pulleys</p> <p>Mixtures and Solutions</p> <p>Water Planet</p>	<p>Investigation 1, Part 2, pp. 16-22 Investigation 2, Parts 3-4, pp. 22-29 Investigation 3, Parts 2-3, pp. 14-22 Investigation 6, Parts 2-3, pp. 14-22</p> <p>Investigation 1, Part 2, pp. 16-20 Investigation 2, Part 1-2, pp. 8-21</p> <p>Investigation 2, Parts 1-2, pp. 8-22 Investigation 3, Parts 1-3, pp. 8-24</p> <p>Investigation 1, Part 1-3, pp. 8-21 Investigation 2, Parts 1-3, pp. 8-22 Investigation 4, Part 1, pp. 8-13</p> <p>Investigation 1, Parts 1-4, pp. 8-29</p> <p>Investigation 2, Parts 2-3, pp. 86-100</p>
<p>4. Identify one or two variables in a simple experiment.</p>	<p>Environments</p> <p>Food and Nutrition</p> <p>Variables</p>	<p>Investigation 2, Parts 1, 3, pp. 10-15, 22-25 Investigation 3, Part 1, pp. 8-13 Investigation 6, Part 1, pp. 8-13</p> <p>Investigation 1, Part 1, pp. 8-15</p> <p>Investigation 1, Parts 1-2, pp. 8-22 Investigation 2, Parts 1-2, pp. 8-18</p>

	<p>Landforms</p> <p>Solar Energy</p> <p>Water Planet</p>	<p>Investigation 3, Parts 1-4, pp. 8-27 Investigation 4, Parts 1-3, pp. 8-23</p> <p>Investigation 2, Parts 1-2, pp. 8-22 Investigation 3, Parts 1-3, pp. 8-24</p> <p>Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23</p> <p>Investigation 2, Parts 2-3, pp. 86-100</p>
5. Identify potential hazards and/or precautions involved in an investigation.	<p>Food and Nutrition</p> <p>Mixtures and Solutions</p> <p>Variables</p> <p>Levers and Pulleys</p> <p>Water Planet</p>	<p>All FOSS Modules contain safety information for teachers and students. For the teachers, safety precautions are printed within the context of the lesson instructions.. Examples include:</p> <p>Investigation 2, p. 26</p> <p>Investigation 1, p. 12</p> <p>Investigation 4, p. 14</p> <p>Investigation 3, p. 12</p> <p>Investigation 1, p. 61</p>
6. Explain why results of an experiment are sometimes different (e.g., because of unexpected differences in what is being investigated, unrealized differences in the methods used or in the circumstances in which the investigation was carried out, and because of errors in observations).	<p>Levers and Pulleys</p> <p>Mixtures and Solutions</p> <p>Solar Energy</p> <p>Living Systems</p>	<p>Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data there are opportunities and instances where this indicator can be addressed and reinforced. See examples below:</p> <p>Investigation 1, Parts 1-3, pp. 8-28 Investigation 2, Parts 1-3, pp. 8-22 Investigation 3, Part 1, pp. 8-15 Investigation 4, Part 1, pp. 8-13</p> <p>Investigation 1, Parts 1-4, pp. 8-29</p> <p>Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23</p> <p>Investigation 3, Part 3, pp. 136-144</p>

Benchmarks (Grades 6-8)

By the end of the 6-8 program:

- A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools.
- B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.

Sixth Grade Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that there are not fixed procedures for guiding scientific investigations; however, the		The diverse nature of FOSS investigations provides the opportunity to address this indicator. See examples below:

nature of an investigation determines the procedures needed.	<p>Environments</p> <p>Mixtures and Solutions</p> <p>Variables</p> <p>Water Planet</p> <p>Diversity of Life</p> <p>Earth History</p> <p>Populations and Ecosystems</p>	<p>Investigation 1, Part 1, pp. 8-15 Investigation 2, Parts 2, 4, pp. 16-21, 26-29</p> <p>Investigation 1, Part 4, pp. 215-29 Investigation 2, Parts 1, 3, pp. 8-15, 21-25</p> <p>Investigation 1, Parts 1-3, pp. 8-27 Investigation 4, Parts 1-4, pp. 8-28</p> <p>Investigation 3, Part 1, pp. 125-135</p> <p>Investigation 8, Parts 2-3, pp. 244-259 Investigation 10, Parts 1-3, pp. 302-321</p> <p>Investigation 3, Parts 2-4, pp. 96-111</p> <p>Investigation 1, Part 3, pp. 55-59 Investigation 5, Part 1, pp. 142-150</p>
2. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.	<p>Levers and Pulleys</p> <p>Solar Energy</p> <p>Food and Nutrition</p> <p>Water Planet</p> <p>Populations and Ecosystems</p> <p>Human Brain and Senses</p> <p>Chemical Interactions</p>	<p>Investigation 1, Parts 1-3, pp. 8-28 Investigation 3, Part 1, pp. 8-15</p> <p>Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23</p> <p>Investigation 2, Parts 1-3, pp. 8-25 Investigation 3, Parts, pp. 8-25</p> <p>Investigation 2, Part 1, pp. 80-85</p> <p>Investigation 3, Parts 1-3, pp. 90-107 Investigation 5, Part 1, pp. 142-150</p> <p>Investigation 7, Parts 1-3, pp. 210-230 Investigation 8, Part 1, pp. 240-245</p> <p>Investigation 5, Parts 1-3, pp. 153-171 Investigation 8, Parts 1-3, pp. 248-268</p>
3. Distinguish between observation and inference.	<p>Landforms</p> <p>Mixtures and Solutions</p> <p>Living Systems</p> <p>Models and Designs</p> <p>Earth History</p> <p>Force and Motion</p> <p>Planetary Science</p>	<p>Although this is not directly taught in the FOSS curriculum, during investigations students make observations, collect and interpret data. From the observations, they make inferences or draw conclusions. See examples of investigations below:</p> <p>Investigation 2, Parts 1-2, pp. 8-22</p> <p>Investigation 2, Part 3, pp. 21-24</p> <p>Investigation 2, Parts 1-2, pp. 85-106</p> <p>Investigation 1, Parts 1-3, pp. 8-25</p> <p>Investigation 6, Part, pp. 220-224</p> <p>Investigation 2, Parts 1-3, pp. 78-99</p> <p>Investigation 5, Parts 2-4, pp. 158-173</p>

4. Explain that a single example can never prove that something is always correct, but sometimes a single example can disprove something.		Although this is not directly taught in the FOSS curriculum, in each module there are investigations where students complete tests and collect data and there are opportunities and instances where this indicator can be addressed and reinforced.
Seventh Grade Scientific Inquiry		
<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Explain that variables and controls can affect the results of an investigation and that ideally one variable should be tested at a time; however it is not always possible to control all variables.	Diversity of Life Planetary Science Force and Motion Chemical Interactions Populations and Ecosystems	FOSS provides the opportunity to address this indicator in the discussions of investigations. See examples below: Investigation 9, Part 2, pp. 278-285 Investigation 5, Parts 2-3, pp. 158-167 Investigation 2, Part 3, pp. 89-99 Investigation 8, Part 2, pp. 256-262 Investigation 5, Part 1, pp. 142-150
2. Identify simple independent and dependent variables.	Diversity of Life Planetary Science Force and Motion Chemical Interactions Populations and Ecosystems	FOSS provides the opportunity to address this indicator in the discussions of investigations. See examples below: Investigation 9, Part 2, pp. 278-285 Investigation 5, Parts 2-3, pp. 158-167 Investigation 2, Part 3, pp. 89-99 Investigation 8, Part 2, pp. 256-262 Investigation 5, Part 1, pp. 142-150
3. Formulate and identify questions to guide scientific investigations that connect to science concepts and can be answered through scientific investigations.	Diversity of Life Planetary Science Human Brain and Senses Force and Motion Electronics	Investigation 8, Part 2, pp. 244-252 Investigation 9, Part 2, pp. 278-285 Investigation 5, Parts 2-3, pp. 158-167 Investigation 8, Parts 2-3, pp. 260-270 Investigation 7, Parts 1-2, pp. 210-225 Investigation 8, Part 1, pp. 240-245 Investigation 2, Part 3, pp. 89-99 Investigation 7, Part 1, pp. 256-261 Investigation 1, Part 3, pp. 66-70 Investigation 5, Part 1, pp. 161-165

<p>4. Choose the appropriate tools and instruments and use relevant safety procedures to complete scientific investigations.</p>	<p>Force and Motion</p> <p>Chemical Interactions</p> <p>Earthy History</p> <p>Weather and Water</p> <p>Electronics</p>	<p>Safety is stressed throughout the modules and safety precautions are indicated to the teacher and student at appropriate times. See examples below for the variety of tools employed through the modules.</p> <p>Investigation 2, Part 3, pp. 89-99 Investigation 6, Parts 1-4, pp. 218-245</p> <p>Investigation 7, Parts 1-4, pp. 204-228 Investigation 9, Parts 1-4, pp. 280-312</p> <p>Investigation 5, Parts 1-3, pp. 175-187 Investigation 8, Parts 1-2, pp. 254-265</p> <p>Investigation 4, Parts 1-2, pp.121-131 Investigation 5, Parts 1-3, pp. 152-174</p> <p>Investigation 1, Parts, 1-5, pp. 55-79 Investigation 3, Parts 1-4, pp. 119-135</p>
<p>5. Analyze alternative scientific explanations and predictions and recognize that there may be more than one good way to interpret a given set of data.</p>	<p>Diversity of Life</p> <p>Earth History</p> <p>Planetary Science</p>	<p>FOSS investigations provide ample opportunity for teachers to address this indicator in post-investigation discussions. See below for examples.</p> <p>Investigation 1, Parts 1-2, pp. 43-63</p> <p>Investigation 4, Parts 1-6, pp. 127-162</p> <p>Investigation 5, Parts 1, 6-7, pp. 154-157, 176-182</p>
<p>6. Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence.</p>	<p>Diversity of Life</p> <p>Earth History</p> <p>Planetary Science</p>	<p>FOSS investigations provide ample opportunity for teachers to address this indicator in post-investigation discussions. See below for examples.</p> <p>Investigation 1, Parts 1-2, pp. 43-63</p> <p>Investigation 4, Parts 1-6, pp. 127-162</p> <p>Investigation 5, Parts 1, 6-7, pp. 154-157, 176-182</p>
<p>7. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed, density).</p>	<p>Diversity of Life</p> <p>Earth History</p> <p>Electronics</p> <p>Planetary Science</p> <p>Populations and Ecosystems</p>	<p>Investigation 2, Part 2, pp. 79-84 Investigation 10, Part 2, pp. 310-316</p> <p>Investigation 6, Parts 1, 4, pp. 205-224</p> <p>Investigation 2, Parts 2-3, pp. 94-103 Investigation 3, Parts 2-4, pp. 124-135</p> <p>Investigation 3, Parts 3-4, pp. 99-109 Investigation 8, Parts 1-4, pp. 250-270</p> <p>Investigation 5, Parts 1-2, 4, pp. 142-155, 161-169 Investigation 6, Parts 1-3, pp. 179-197</p>

Eighth Grade Scientific Inquiry

<i>Grade level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.	<p>Force and Motion</p> <p>Chemical Interactions</p> <p>Earthy History</p> <p>Weather and Water</p> <p>Electronics</p>	<p>Safety is stressed throughout the modules and safety precautions are indicated to the teacher and student at appropriate times. See examples below for the variety of tools employed through the modules.</p> <p>Investigation 2, Part 3, pp. 89-99 Investigation 6, Parts 1-4, pp. 218-245</p> <p>Investigation 7, Parts 1-4, pp. 204-228 Investigation 9, Parts 1-4, pp. 280-312</p> <p>Investigation 5, Parts 1-3, pp. 175-187 Investigation 8, Parts 1-2, pp. 254-265</p> <p>Investigation 4, Parts 1-2, pp.121-131 Investigation 5, Parts 1-3, pp. 152-174</p> <p>Investigation 1, Parts, 1-5, pp. 55-79 Investigation 3, Parts 1-4, pp. 119-135</p>
2. Describe the concepts of sample size and control and explain how these affect scientific investigations	Populations and Ecosystems	Investigation 8, Parts 1-2, pp. 228-243 Resources, pp. 42-45 CD, Walking Stick Predation
3. Read, construct and interpret data in various forms produced by self and others in both written and oral form (e.g., tables, charts, maps, graphs, diagrams, symbols).	<p>Earth History</p> <p>Electronics</p> <p>Planetary Science</p> <p>Weather and Water</p> <p>Populations and Ecosystems</p>	<p>Investigation 4, parts 1-6, pp. 127-162 Investigation 6, Parts 1-4, pp. 205-224</p> <p>Investigation 2, Parts 2-3, pp. 94-103 Investigation 3, Parts 2-4, pp. 124-135</p> <p>Investigation 3, Parts 3-4, pp. 99-109 Investigation 8, Parts 1-4, pp. 250-270</p> <p>Investigation 1, Part 2, pp. 48-53 Investigation 4, Parts 1-2, pp. 122-139</p> <p>Investigation 9, Parts 1-4, pp. 262-291 Investigation 10, Parts 1-3, pp. 302-318</p>
4. Apply appropriate math skills to interpret quantitative data (e.g., mean, median, mode). Data from these investigations can be quantified as a class.	<p>Diversity of Life</p> <p>Earth History</p> <p>Electronics</p> <p>Populations and Ecosystems</p> <p>Force and Motion</p>	<p>Investigation 6, Parts 1, 3, pp. 186-192, 198-202 Investigation 6, Extending the Experience, p. 203 Investigation 10, Part 2, pp. 310-316</p> <p>Investigation 6, Parts 1, 4, pp. 205-208, 220-224</p> <p>Investigation 2, Parts 2-3, pp. 94-103 Investigation 5, Parts 1-3, pp. 161-174</p> <p>Investigation 5, Part 1, pp. 142-150 Investigation 6, Part 1, pp. 179-186</p> <p>Investigation 2, Part 3, pp. 89-99 Investigation 7, Part 2, pp. 262-266</p>

Scientific Ways of Knowing

Benchmarks (Grades K-2)

By the end of the K-2 program:

- A. Recognize that there are different ways to carry out scientific investigations. Realize that investigations can be repeated under the same conditions with similar results and may have different explanations.
- B. Recognize the importance of respect for all living things.
- C. Recognize that diverse groups of people contribute to our understanding of the natural world.

Kindergarten Scientific Ways of Knowing		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Recognize that scientific investigations involve asking open-ended questions. (How? What if?)	All Modules Fabric Wood and Paper	FOSS encourages students to ask questions in all the investigations. This can be noted in the discussion of each of the activities in the “Wrapping up” section. See for example: Investigation 2, Part 2, pp. 12-17 Investigation 2, Part 3, pp. 16-19 Science Stories, pp. 9-12
2. Recognize that people are more likely to accept your ideas if you can give good reasons for them	All Modules Animals Two by Two Wood and Paper	FOSS encourages students to provide evidence for explanations and ideas relating to their investigations. See for example: Investigation 1, Part 1, pp. 10-16 Investigation 1, Part 3, pp. 20-23
3. Interact with living things and the environment in ways that promote respect.	Animals Two by Two Trees	Investigation 2, Parts 1-4, pp. 9-24 Investigation 3, Parts 1-3, pp. 8-20 Investigation 4, Parts 1-4, pp. 8-23 Investigation 5, Parts 1-4, pp. 10-27 Investigation 1, Parts 1-2, 7-8, pp. 7-19, 31-37 Investigation 2, Parts 1, 3, pp. 6-9, 16-19 Investigation 3, Parts 3-4, 6, 9, pp. 15-21, 26-28, 35-38
4. Demonstrate ways that science is practiced by people everyday (children and adults).	All Modules Fabric Trees Wood and Paper	Science inquiry is the nature of the FOSS Program. Thus, students practice the skills scientists use as they take in and process information while they do developmentally-appropriate investigations. See below: Investigation 2, Parts 1-4, pp. 7-25 Science Stories, pp. 3-24 Investigation 1, Part 1, pp. 7-14 Investigation 1, Social Studies Extension, pp. 34-35 Investigation 2, Part 3, pp. 16-19 Investigation 4, Part 1-2, pp. 8-18

First Grade Scientific Ways of Knowing

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Discover that when a science investigation is done the same way multiple times, one can expect to get very similar results each time it is performed	<p>All Modules</p> <p>Balance and Motion</p> <p>New Plants</p> <p>Plants and Animals</p>	<p>FOSS provides the opportunity to address this indicator through investigations. See examples below:</p> <p>Investigation 3, Parts 1-3, pp. 6-25</p> <p>Investigation 1, Part 3, pp. 23-30 Investigation 4, Part 2, pp. 13-19</p> <p>Investigation 1, Parts 1-2, pp. 47-62 Investigation 4, Part 2, pp. 157-163</p>
2. Demonstrate good explanations based on evidence from investigations and observations.	<p>All Modules</p> <p>Air and Weather</p> <p>Balance and Motion</p> <p>New Plants</p> <p>Pebbles, Sand and Silt</p> <p>Plants and Animals</p>	<p>FOSS provides the opportunity to address this indicator through investigations. See examples below:</p> <p>Investigation 1, Parts 2-5, pp. 13-33</p> <p>Investigation 3, Parts 1-3, pp. 6-25</p> <p>Investigation 2, Parts 2-3, pp. 15-28</p> <p>Investigation 2, Parts 3-4, pp. 18-29</p> <p>Investigation 1, Part 2, pp. 47-62</p>
3. Explain that everybody can do science, invent things and have scientific ideas no matter where they live.	<p>All Modules</p> <p>Solids and Liquids</p> <p>Pebbles, Sand and Silt</p> <p>New Plants</p> <p>Balance and Motion</p> <p>Plants and Animals</p>	<p>Science inquiry is the nature of the FOSS Program. Thus, students practice the skills scientists use as they take in and process information while they perform developmentally-appropriate investigations. See below:</p> <p>Investigation 1, Part 3, pp. 21-24</p> <p>Investigation 1, Part 1, pp. 8-12</p> <p>Investigation 4, Home School Connection, p. 23</p> <p>Investigation 1, Part 2, pp. 14-18 Investigation 3, Parts 1-2, pp. 6-18</p> <p>Investigation 4, Home School Connection, p. 169</p>

Second Grade Scientific Ways of Knowing

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe that scientific investigations generally work the same way under the same conditions.	<p>All Modules</p> <p>Air and Weather</p> <p>Balance and Motion</p> <p>New Plants</p>	<p>FOSS provides the opportunity to address this indicator through its investigations. See examples below:</p> <p>Investigation 1, Parts 2, 6, pp. 13-16, 34-38</p> <p>Investigation 3, Parts 1-3, pp. 6-25</p> <p>Investigation 1, Part 3, pp. 23-30 Investigation 4, Parts 1-2, pp. 7-19</p>

	Plants and Animals	Investigation 1, Parts 2-3, pp. 58-72
2. Explain why scientists review and ask questions about the results of other scientists' work.	All Modules	Investigations provide the teacher with opportunities to explore this indicator. However, it is not explicitly taught in the FOSS curriculum.
3. Describe ways in which using the solution to a problem might affect other people and the environment.		
4. Demonstrate that in science it is helpful to work with a team and share findings with others.	Balance and Motion Insects Solids and Liquids Plants and Animals Insects and Plants	FOSS modules encourage and promote cooperative learning strategies. The interaction between team members is an integral part of each investigation. See examples below: Investigation 1, Part 2, pp. 14-18 Investigation 3, Parts 1-3, pp. 6-25 Investigation 3, Part 3, pp. 21-26 Investigation 4, Part 3, pp. 19-22 Investigation 1, Part 3, pp.21-24 Investigation 3, Part 2, pp. 14-18 Investigation 1, Parts 1-2, pp. 47-62 Investigation 3, Parts 1-3, pp. 129-151 Investigation 5, Parts 1-3, pp. 206-225

Benchmarks (Grades 3-5)

By the end of the 3-5 program:

- A. Distinguish between fact and opinion and explain how ideas and conclusions change as new knowledge is gained.
- B. Describe different types of investigations and use results and data from investigations to provide the evidence to support explanations and conclusions.
- C. Explain the importance of keeping records of observations and investigations that are accurate and understandable.
- D. Explain that men and women of diverse countries and cultures participate in careers in all fields of science.

Third Grade Scientific Ways of Knowing		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Describe different kinds of investigations that scientists use depending on the questions they are trying to answer.	All Modules	Throughout the FOSS modules, students test ideas, explore and investigate objects and systems, and complete investigations and demonstrations. This indicator is not explicitly taught in the curriculum, but can be reinforced as the teacher explains each investigation students will conduct.

2. Keep records of investigations and observations and do not change the records that are different from someone else's work.	All Modules	Throughout the FOSS modules in grades 3-6, students keep a journal or record information/observations in a different format Teachers can reinforce the idea that what they observe is real and should not be changed.
3. Explore through stories how men and women have contributed to the development of science.	Physics of Sound Magnetism and Electricity Structures of Life Water Measurement Sun, Moon and Stars	Science Stories, p. 14 Science Stories, pp. 12-23 Science Stories, pp. 6-9 Science Stories, pp. 24-26 Science Stories, p. 21 Science Resources, pp. 40, 44
4. Identify various careers in science.	Earth Materials Human Body Measurement Water Sun, Moon and Stars	Investigation 1, Science Extension, p. 32 Science Stories, pp. 1-7 Science Stories, pp. 5-7, 17-20, 21-24 Science Stories, pp. 14-15 Science Stories, pp. 14-21 Science Resources, pp. 44-46
5. Discuss how both men and women find science rewarding as a career and in their everyday lives.	Earth Materials Human Body Measurement Water Sun, Moon and Stars	Investigation 1, Science Extension, p. 32 Science Stories, pp. 1-7 Science Stories, pp. 5-7, 17-20, 21-24 Science Stories, pp. 14-15 Science Stories, pp. 14-21 Science Resources, pp. 44-46

Fourth Grade Scientific Ways of Knowing

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Differentiate fact from opinion and explain that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed	All Modules	In the FOSS modules, students are asked to draw conclusions based on data they have collected. The idea of opinion is not specifically taught in the curriculum, however, students are consistently asked to provide evidence to support their claims.
2. Record the results and data from an investigation and make a reasonable explanation.	All Modules	In all FOSS investigations students complete the investigation, record results and data and draw conclusions based on the observations.
3. Explain discrepancies in an investigation using evidence to support findings.	All Modules	Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data, there are opportunities and instances where this indicator can be addressed and reinforced.
4. Explain why keeping records of observations and investigations is important.	All Modules	Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data, there are opportunities and instances where this indicator can be addressed and reinforced.

Fifth Grade Scientific Ways of Knowing

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Summarize how conclusions and ideas change as new knowledge is gained	Mixtures and Solutions	Science Stories, pp. 32-36, 43-45
	Models and Designs	Science Stories, pp. 1-16, 44-47
2. Develop descriptions, explanations and models using evidence to defend/support findings.	Food and Nutrition	Investigation 1, Parts 1-2, pp. 8-20 Investigation 2, Parts 1-2, pp. 8-21
	Landforms	Investigation 3, Parts 1-3, pp. 8-24
	Models and Designs	Investigation 1, Parts 1-3, pp. 8-25
	Solar Energy	Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23
	Variables	Investigation 1, Parts 1-3, pp. 8-27 Investigation 2, Parts 1-3, pp. 8-23 Investigation 3, Parts 2-4, pp. 14-27
	Water Planet	Investigation 2, Parts 2-3, pp. 86-100
3. Explain why an experiment must be repeated by different people or at different times or places and yield consistent results before the results are accepted.		Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data, there are opportunities and instances where this indicator can be addressed and reinforced. See examples below:
	Food and Nutrition	Investigation 1, Parts 1-2, pp. 8-20 Investigation 2, Parts 1-2, pp. 8-21
	Landforms	Investigation 3, Parts 1-3, pp. 8-24
	Models and Designs	Investigation 1, Parts 1-3, pp. 8-25
	Solar Energy	Investigation 2, Parts 1-2, pp. 8-24 Investigation 3, Parts 1-2, pp. 8-23
	Variables	Investigation 1, Parts 1-3, pp. 8-27 Investigation 2, Parts 1-3, pp. 8-23 Investigation 3, Parts 2-4, pp. 14-27
	Water Planet	Investigation 2, Parts 2-3, pp. 86-100
4. Identify how scientists use different kinds of ongoing investigations depending on the questions they are trying to answer (e.g., observations of things or events in nature, data collection, controlled experiments).		Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data, make observations of objects, or explore models there are opportunities and instances where this indicator can be addressed and reinforced. See examples below:
	Environments	Investigation 1, Part 2, pp. 16-22 Investigation 2, Parts 3-4, pp. 22-29 Investigation 3, Parts 2-3, pp. 14-22 Investigation 6, Parts 2-3, pp. 14-22
	Food and Nutrition	Investigation 1, Part 2, pp. 16-20 Investigation 2, Part 1-2, pp. 8-21

	Landforms Levers and Pulleys Mixtures and Solutions Living Systems	Investigation 2, Parts 1-2, pp. 8-22 Investigation 3, Parts 1-3, pp. 8-24 Investigation 1, Part 1-3, pp. 8-21 Investigation 2, Parts 1-3, pp. 8-22 Investigation 4, Part 1, pp. 8-13 Investigation 1, Parts 1-4, pp. 8-29 Investigation 3, Part 3, pp. 136-141
5. Keep records of investigations and observations that are understandable weeks or months later.		In most grade 5-6 modules students keep a journal of observations and data. They also make graphs and create models from which they draw conclusions and build understanding. Modules that use a journal for recording include: Solar Energy Landforms Environments Models and Designs Variables Levers and Pulleys Food and Nutrition
6. Identify a variety of scientific and technological work that people of all ages, backgrounds and groups perform.	Mixtures and Solutions Environments Landforms Variables Models and Designs Water Planet	Science Stories, pp. 29-31 Science Stories, pp. 23-26 Science Stories, pp. 9-14 Science Stories, pp. 21-28 Science Stories, pp. 29-30 Science Resources, p. 82

Benchmarks (Grades 6-8)

By the end of the 6-8 program:

- Use the skills of scientific inquiry processes (e.g., hypothesis, record keeping, description, explanation).
- Explain the importance of reproducibility and reduction of bias in scientific methods.
- Give examples of how thinking scientifically is helpful in daily life.

Sixth Grade Scientific Ways of Knowing		
<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Identify that hypotheses are valuable even when they are not supported.	Variables	Science Stories, pp. 1-6
	Planetary Science	Investigation 5, Part 1, pp.154-60
	Diversity of Life	Resources, pp. 24-26

<p>2. Describe why it is important to keep clear, thorough and accurate records.</p>		<p>Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data they keep records in journals and reports. This provides opportunities and instances where this indicator can be addresses and reinforced. Examples of journaling can be found in the following modules: Solar Energy Landforms Environments In the FOSS Middle School Program students use a lab notebook for recording information. For future use.</p>
<p>3. Identify ways scientific thinking is helpful in a variety of everyday settings.</p>	<p>Variables Environments Food and Nutrition Water Planet Earth History Planetary Science Weather and Water</p>	<p>Science Stories, pp. 5-6, 8-9, 32-33, 34-37 Science Stories, pp. 23-26, 46-48 Science Stories, pp.1-5, 14-19, 24-25, 27-29, 34-36 Investigation 2, Part 4, pp. 101-110 Investigation 4, Part 2, pp. 198-203 Investigation 1, Parts -12, pp. 39-49 Investigation 6, Part 1, pp. 205-208 Investigation 1, Parts 1-3, pp. 38-52 Investigation 1, Extending the Experience, p. 53 Resources, pp. 52-53 Investigation 9, Part 4, pp. 316-318</p>
<p>4. Describe how the pursuit of scientific knowledge is beneficial for any career and for daily life.</p>	<p>Mixtures and Solutions Food and Nutrition Models and Designs Variables Water Planet Electronics Planetary Science Earth History Chemical Interactions</p>	<p>Science Stories, pp. 13-15, 20-22, 29-31, 43-45 Science Stories, pp. 16-19, 24-25, 34-36 Science Stories, pp. 1-4, 14-16, 21-24 Science Stories, pp. 5-6, 8-9, 32-33, 34-37 Science Resources, p. 82 Investigation 8, Extending the Experience, p. 275 Resources, pp. 71-73 Resources, pp. 98-99 Resources, pp. 78-85</p>

5. Research how men and women of all countries and cultures have contributed to the development of science.	Landforms	Science Stories, pp. 9-14,
	Mixtures and Solutions	Science Stories, pp. 5, 9-10, 24, 33, 35-36
	Variables	Science Stories, pp. 4-6, 12-14, 21-28
	Water Planet	Science Resources, pp. 15, 18-19
	Force and Motion	Resources, pp. 50-53, 62-66
	Chemical Interactions	Resources, pp. 7-8, 60, 69-72, 78-85
	Earth History	Resources, pp. 83-87
	Populations and Ecosystems	Resources, pp. 46-55, 58-61

Seventh Grade Scientific Ways of Knowing

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Show that the reproducibility of results is essential to reduce bias in scientific investigations.		Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data they keep records in journals and reports. This provides opportunities and instances where this indicator can be addresses and reinforced.
2. Describe how repetition of an experiment may reduce bias.		Although this is not directly taught in the FOSS curriculum, in each investigation where students complete tests and collect data they keep records in journals and reports. This provides opportunities and instances where this indicator can be addresses and reinforced.
3. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism, openness).	Force and Motion Chemical Interactions Earth History Populations and Ecosystems	Although this is not directly taught in the FOSS curriculum investigations provide opportunities and instances where this indicator can be addresses and reinforced. Resources often include information about scientists where these attributes can be deduced. See examples below: Resources, pp. 50-53, 62-66 Resources, pp. 7-8, 60, 69-72, 78-85 Resources, pp. 83-87 Resources, pp. 46-55, 58-61

Eight Grade Scientific Ways of Knowing

<i>Grade Level Indicator</i>	<i>FOSS Module Title</i>	<i>Investigation/Resources</i>
1. Identify the difference between description (e.g., observation and summary) and explanation (e.g., inference, prediction, significance, importance).	<p>Diversity of Life</p> <p>Earth History</p> <p>Planetary Science</p> <p>Weather and Water</p>	<p>Although this is not directly taught in the FOSS curriculum investigations provide opportunities and instances where this indicator can be addresses and reinforced. See examples below:</p> <p>Investigation 1, Parts 1-2, pp. 43-63 Investigation 8, Parts 2-3, pp. 244-259 Investigation 9, Parts 2-3, pp. 278-289</p> <p>Investigation 4, Parts 1-6, pp. 127-162 Investigation 5, parts 1-3, pp. 175-187</p> <p>Investigation 9, Parts 1-4, pp. 283-301 Investigation 10, Parts 2-3, pp. 318-324</p> <p>Investigation 6, Parts 1-5, pp. 190-220</p>
2. Explain why it is important to examine data objectively and not let bias affect observations.	<p>Planetary Science</p> <p>Weather and Water</p>	<p>Although this is not directly taught in the FOSS curriculum investigations provide opportunities and instances where this indicator can be addresses and reinforced. See examples below:</p> <p>Investigation 1, Parts 1-3, pp. 38-52 Investigation 1, Extending the Experience, p. 53</p> <p>Investigation 9, Part 4, p. 316-318</p>