



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

Correlation to



Correlation of the Illinois Learning Standards for Science To Full Option Science System

The following is a correlation of the Early Elementary, Late Elementary and Middle/Junior High portions of the Illinois Learning Standards for Science to Full Option Science System (FOSS). This correlation is to show representative examples of investigations and activities from the FOSS program, which address the standards and their benchmarks. A citation does not reflect all of the investigations or activities from FOSS that might address a particular benchmark.

The examples of FOSS investigations cited below for the Middle/Junior High Benchmarks are from modules developed for grades 5-6 and from the FOSS Middle School Science Program. The NSF (National Science Foundation) funded FOSS Middle School Science Program is currently under development and is being field-tested. It will contain courses for grades 6-8. The 9 FOSS Middle School courses are Planetary Science, Human Brain and Senses, Earth History, Electronics, Diversity of Life, Weather and Water, Populations and Ecosystems, Chemistry, and Force and Motion. These FOSS Middle School Science course titles will be included in the correlation where coverage is anticipated. The FOSS Middle School courses Planetary Science, Electronics, Earth History and Human Brain and Senses are available now. The others will be available between now and 2002.

STATE GOAL 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

Learning Standard A. Know and apply the concepts, principles and processes of scientific inquiry.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
<p>11.A.1a Describe an observed event</p>	<p><u>Wood</u>, Activity 1, Part 3, Pages 8-9 <u>Solids and Liquids</u>, Investigation 2, Part 1, Pages 10-14 FOSS Science Stories <u>Solids and Liquids</u>, page12 <u>Air and Weather</u>, Investigation 4, Parts 1-4, Pages 8-24 FOSS Science Stories, <u>Air and Weather</u>, Pages 18-23 <u>Balance and Motion</u>, Investigation 2, Part 1, Pages 8-13 FOSS Science Stories, <u>Balance and Motion</u>, pages 10-13, 14-17</p>	<p>11.A.2a Formulate questions on a specific science topic and</p>	<p><u>Magnetism and Electricity</u>, Investigation 5, Part 3, Pages 24-25 <u>Human Body</u>, Investigation 1, Part 3, Pages 21-25 <u>Environments</u>, Investigation 4, Part 2, Pages 13-22 <u>Landforms</u>, Investigation 3, Part 3, Pages 20-24</p>	<p>11.A.3a Formulate hypotheses that can be tested by collecting data.</p>	<p><u>Food and Nutrition</u>, Investigation 2, Part 3, Pages 23-25 <u>Variables</u>, Investigation 3, Part 3, Pages 20-23 <u>Levers and Pulleys</u>, Investigation 4, Part 3, Pages 21-25 <u>Mixtures and Solutions</u>, Investigation 1, Part 4, Pages 25-29</p> <p>It is anticipated that all nine FOSS Middle School Science Program courses will require students to formulate hypotheses that can be tested by collecting data.</p>

<p>11.A.1b Develop questions on scientific topics.</p>	<p>New Plants, Investigation 2, Part 2, Page 17 <u>Solids and Liquids</u>, Investigation 4, Part 1, Pages 7-16 FOSS Science Stories, <u>Solids and Liquids</u>, Page 23 <u>Air and Weather</u>, Investigation 1, Part 1, Page 12 <u>Water</u>, Investigation 4, Part 4, Pages 24-29</p>	<p>11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.</p>	<p><u>Magnetism and Electricity</u>, Investigation 1, Part 3, Pages 24-29 <u>Human Body</u>, Investigation 4, Part 2, Pages 17-20 <u>Solar Energy</u>, Investigation 1, Part 2, Pages 14-23 <u>Environments</u>, Investigation 4, part 2, Pages 13-19</p>	<p>11.A.3b Conduct scientific experiments that control all but one variable.</p>	<p><u>Variables</u>, Investigation 1, Part 2, Pages 16-22 <u>Food and Nutrition</u>, Investigation 1, Parts 1 & 2, Pages 1-22 <u>Mixtures and Solutions</u>, Investigation 2, Part 3, Pages 21-25</p> <p>It is anticipated that all nine FOSS Middle School Science Program courses will require students to conduct scientific experiments in which they control all but one variable.</p>
<p>11.A.1c Collect data for investigations using measuring instruments and technologies.</p>	<p><u>New Plants</u>, Investigation 1, Part 2, Page 21; Investigation 2, Part 3, Page 27 <u>Air and Weather</u>, Investigation 2, Part 2, Pages 14-19; Investigation 2, Part 4, Pages 26-27; Investigation 3, Part 2, Page 13 <u>Measurement</u>, Investigations 1-4, All Parts, All Pages <u>Earth Materials</u>, Investigation 1, Part 1, Page 12</p>	<p>11.A.2c Construct charts and visualizations to display data.</p>	<p><u>Ideas and Inventions</u>, Investigation 2, Part 1, Pages 11-15 <u>Environments</u>, Investigation 5, Part 2, Pages 16-18 <u>Magnetism and Electricity</u>, Investigation 1, Part 3, Pages 24-29 <u>Landforms</u>, Investigation 4, Part 1, Pages 1-7</p>	<p>11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.</p>	<p><u>Levers and Pulleys</u>, Investigation 1, Part 2, Pages 18-23 FOSS Web Site, FOSSWEB.com, <u>Levers and Pulleys</u> simulation <u>Mixtures and Solutions</u>, Investigation 3, Part 1, Pages 1-14</p> <p>It is anticipated that all nine FOSS Middle School Science Program courses will require students to record data accurately & do consistent measuring and recording.</p>

<p>11.A.1d Record and store data using available technologies.</p>	<p><u>Trees</u>, Activity 1, Part 2, Pages 8-10 <u>Insects</u>, Investigation 1, Pages 1-15 <u>Earth Materials</u>, Investigation 2, Part 2, Pages 14-20 <u>Structures of Life</u>, Investigation 2, Part 1, Pages 1- 13</p>	<p>11.A.2d Use data to produce reasonable explanations.</p>	<p><u>Human Body</u>, Investigation 1, Part 1, Pages 1-15 <u>Models and Designs</u>, Investigation 1, Part 1, Pages 1-17 <u>Physics of Sound</u>, Investigation 2, Part 2, Pages 13-19 <u>Solar Energy</u>, Investigation 2, Part 1, Pages 1-14</p>	<p>11.A.3d Explain the existence of unexpected results in a data set.</p>	<p><u>Variables</u>, Investigation 1, Part 2, Pages 16-22 <u>Levers and Pulleys</u>, Investigation 1, Part 2, Page 21 <u>Mixtures and Solutions</u>, Investigation 2, Part 1, Page 13</p> <p>It is anticipated that many of the nine FOSS Middle School Science Program courses will require students to compare results and explain causes of differences in data.</p>
<p>11.A.1e Arrange data into logical patterns and describe the patterns.</p>	<p><u>Trees</u>, Activity 2, Part 2, Pages 6-8 <u>Pebbles, Sand and Silt</u>, Investigation 1, Parts 3 & 4, Pages 18-25 <u>Air and Weather</u>, Investigation 4, Parts 1-3, Pages 8-24 <u>Structures of Life</u>, Investigation 2, Part 1, Pages 1-13</p>	<p>11.A.2e Report and display the results of individual and group investigations.</p>	<p><u>Ideas and Inventions</u>, Investigation 2, Part 1, Pages 1-15 <u>Environments</u>, Investigation 5, Part 2, Pages 14-18 <u>Solar Energy</u>, Investigation 4, Part 4, Pages 29-33 <u>Physics of Sound</u>, Investigation 4, Part 2, Pages 16-20</p>	<p>11.A.3e Use data manipulation tools and quantitative (e.g., mean, mode, simple equations) and representational methods (e.g., simulations, image processing) to analyze measurements.</p>	<p>FOSS Web Site, FOSSWEB.com, <u>Levers and Pulleys Simulation</u> <u>Levers and Pulleys</u>, Investigation 4, Part 2, Pages 14-20 FOSS Web Site, FOSSWEB.com, <u>Variables Simulation</u> The FOSS web Site, FOSSWEB.com has a calculator.</p> <p>Each of the nine FOSS Middle School Science Program courses has a CD ROM disk.</p>

<p>11.A.1f Compare observations of individual and group results.</p>	<p><u>Balance and Motion</u>, Investigation 1, part 2, Pages 14-18 <u>Insects</u>, Investigation 1, Part 2, Pages 18-21 <u>Pebbles, Sand, and Silt</u>, Investigation 1, Part 3-4, Pages 18-25 <u>Water</u>, Investigation 1, Part 2, Pages 14-18</p>			<p>11.A.3f Interpret and represent results of analysis to produce findings.</p>	<p><u>Mixtures and Solutions</u>, Investigation 2, Part 3, Pages 20-24 <u>Levers and Pulleys</u>, Investigation 1, Part 2, Pages 18-23 <u>Food and Nutrition</u>, Investigation 2, Part 2, Pages 18-21 <u>Variables</u>, Investigation 1, Part 2, Pages 16-22</p> <p>It is anticipated that many or all of the nine FOSS Middle School Science Program courses will require students to interpret and represent results of analysis to produce findings.</p>
				<p>11.A.3g Report and display the process and results of a scientific investigation.</p>	<p><u>Mixtures and Solutions</u>, Investigation 4, Part 4, Pages 25-24 <u>Levers and Pulleys</u>, Investigation 4, Part 3, Pages 21-25 <u>Food and Nutrition</u>, Investigation 4, Part 2, Pages 16-20 <u>Variables</u>, Investigation 4, Part 4, Pages 24-28</p>

Learning Standard B. Know and apply the concepts, principles and processes of technological design.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
11.B.1a Given a simple design problem, formulate possible solutions.	<u>Paper</u> , Activity 1, Part 2, Pages 7-9 <u>Solids and Liquids</u> , Investigation 1, Part 3, Pages 21-24 <u>Balance and Motion</u> , Investigation 2, Part 1, Pages 8-13	11.B.2a Identify a design problem and propose possible solutions.	<u>Ideas and Inventions</u> , Investigation 1, Part 3, Pages 18-21 <u>Physics of Sound</u> , Investigation 1, Part 2, Pages 16-20 <u>Magnetism and Electricity</u> , Investigation 3, Part 3, Pages 22-26	11.B.3a Identify an actual design problem and establish criteria for determining the success of a solution.	<u>Models and Designs</u> , Investigation 4, Parts 1-2, Pages 6-15 <u>Electronics</u> , Investigation 9, Part 2, Pages 290-297 It is anticipated that many of the other FOSS Middle School Science Program courses will require students to identify design problems and establish criteria for determining the success of a solution.
11.B.1b Design a device that will be useful in solving the problem.	<u>Solids and Liquids</u> , Investigation 1, Part 3, Pages 21-24 <u>Balance and Motion</u> , Investigation 2, Part 2, Pages 14-19 <u>Air and Weather</u> , Investigation 3, Part 5, Art Extension, Page 35	11.B.2b Develop a plan, design and procedure to address the problem identifying constraints (e.g., time, materials, technology).	<u>Ideas and Inventions</u> , Investigation 4, Part 4, Pages 22-25 <u>Earth Materials</u> , Investigation 4, Part 2, Pages 14-18 <u>Human Body</u> , Investigation 4, Part 4, Pages 25-29	11.B.3b Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness and safety.	<u>Models and Designs</u> , Investigation 4, Part 3, Pages 16-20 <u>Variables</u> , Investigation 4, Part 4, Pages 24-28 <u>Planetary Science</u> , Investigation 10, Part 3, Pages 322-324

<p>11.B.1c Build the device using the materials and tools provided.</p>	<p><u>Wood</u>, Activity 2, Part 7, Pages 16-17 <u>Solids and Liquids</u>, Investigation 1, Part 3, Pages 21-24 <u>Balance and Motion</u>, Investigation 2, Part 1, Pages 8-13</p>	<p>11.B.2c Build a prototype of the design using available tools and materials.</p>	<p><u>Magnetism and Electricity</u>, Investigation 3, Part 3, Pages 22-26 <u>Physics of Sound</u>, Investigation 4, Part 1, Pages 6-15 <u>Ideas and Inventions</u>, Investigation 4, Part 3, Pages 18-21</p>	<p>11.B.3c Select the most appropriate design and build a prototype or simulation.</p>	<p><u>Models and Designs</u>, Investigation 4, Parts 1-2, Pages 6-15 <u>Electronics</u>, Investigation 9, Part 2, Pages 290-297 <u>Planetary Science</u>, Investigation 10, Part 3, Pages 322-324</p>
<p>11.B.1d Test the device and record results using given instruments, techniques and measurement methods.</p>	<p><u>Air and Weather</u>, Investigation 3, Part 5, Art Extension, Page 35</p>	<p>11.B.2d Test the prototype using suitable instruments, techniques and quantitative measurements to record data.</p>	<p><u>Magnetism and Electricity</u>, Investigation 4, Parts 1-3, Pages 8-22 <u>Solar Energy</u>, Investigation 3, Part 3, Pages 24-28</p>	<p>11.B.3d Test the prototype using available materials, instruments and technology and record the data.</p>	<p><u>Models and Designs</u>, Investigation 4, Parts 1-2, Pages 6-15 <u>Electronics</u>, Investigation 9, Part 2, Pages 290-297</p>
<p>11.B.1e Report the design of the device, the test process and the results in solving a given problem.</p>	<p><u>Solids and Liquids</u>, Investigation 1, Part 3, Page 24 <u>Air and Weather</u>, Investigation 3, Part 5, Pages 30-33</p>	<p>11.B.2e Assess test results and the effectiveness of the design using given criteria and noting possible sources of error.</p>	<p><u>Magnetism and Electricity</u>, Investigation 4, Parts 1-3, Pages 8-22 <u>Solar Energy</u>, Investigation 3, Part 3, Pages 24-28</p>	<p>11.B.3e Evaluate the test results based on established criteria, note sources of error and recommend improvements.</p>	<p><u>Models and Designs</u>, Investigation 4, Parts 1-2, Pages 6-15 <u>Electronics</u>, Investigation 9, Part 2, Pages 290-297</p>
		<p>11.B.2f Report test design, test process and test results</p>	<p><u>Magnetism and Electricity</u>, Investigation 4, Parts 1-3, Pages 8-22 <u>Solar Energy</u>, Investigation 3, Part 3, Pages 24-28</p>	<p>11.B.3f Using available technology, report the relative success of the design based on the test results and criteria.</p>	<p><u>Models and Designs</u>, Investigation 4, Parts 1-2, Pages 6-15 <u>Electronics</u>, Investigation 9, Part 2, Pages 290-297</p>

STATE GOAL 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.

A. Know and apply concepts that explain how living things function, adapt and change.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
12.A.1a Identify and describe the component parts of living things (e.g., birds have feathers; people have bones, blood, hair, skin) and their major functions.	<u>Animals Two by Two</u> , Activity 1, Part 1, Pages 6-8 <u>New Plants</u> , Investigation 1, Part 3, Pages 23-28 FOSS Science Stories, <u>New Plants</u> , Pages 3-7, 12-15, 18-23 <u>Insects</u> , Investigation 4, Part 4, Pages 23-26 FOSS Science Stories, <u>Insects</u> , Pages 16-23 <u>Structures of Life</u> , Investigation 3, Part 1, Pages 1-15	12.A.2a Describe simple life cycles of plants and animals and the similarities and differences in their offspring.	<u>Environments</u> , Investigation 2, Part 2, Pages 18-21 FOSS Web Site, FOSSWEB.com <u>Structures of Life</u> , Life Cycles Activity	12.A.3a Explain how cells function as “building blocks” of organisms and describe the requirements for cells to live.	FOSS Science Stories, <u>Human Body</u> , Pages 4, 8, 28-29 FOSS Science Stories, <u>Models and Design</u> , Page 4 <u>Diversity of Life</u> Middle School Course
12.A.1b Categorize living organisms using a variety of observable features (e.g., size, color, shape, backbone).	<u>Trees</u> , Activity 1, Part 4, Page 12 <u>Insects</u> , Investigation 1, Part 2, Pages 16-21 FOSS Science Stories, <u>Insects</u> , Pages 12-13 <u>New Plants</u> , Investigation 2, Parts	12.A.2b Categorize features as either inherited or learned (e.g., flower color or eye color is inherited; language is learned).	FOSS Science Stories, <u>Environments</u> , Pages 43-44 FOSS Science Stories, <u>Models and Design</u> , Page 4	12.A.3b Compare characteristics of organisms produced from a single parent with those of organisms produced by two parents.	<u>Populations and Ecosystems</u> , Middle School Course

	1&2, Pages 8-19 FOSS Science Stories, <u>New Plants</u> , Pages 15, 18-23 <u>Structures of Life</u> , Investigation 4, Part 2, Pages 14-18				
				12.A.3c Compare and contrast how different forms and structures reflect different functions (e.g., similarities and differences among animals that fly, walk or swim; structures of plant cells and animal cells).	FOSS Science Stories, <u>Human Body</u> , Pages 4, & 11 <u>Diversity of Life</u> Middle School Course <u>Populations and Ecosystems</u> , Middle School Course

B. Know and apply concepts that describe how living things interact with each other and with their environment.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
12.B.1a Describe and compare characteristics of living things in relationship to their environments.	<u>Animals Two by Two</u> , Activity 1, Part 2, Pages 9-10 <u>Insects</u> , Investigation 6, Part 1, Pages 8-13 FOSS Science Stories, <u>Insects</u> , Pages 8-11 <u>Structures of Life</u> , Investigation 3, Parts 2-4, Pages 16-30	12.B.2a Describe relationships among various organisms in their environments (e.g., predator/prey, parasite/host, food chains and food webs).	<u>Environments</u> , Investigation 4, Part 3, Pages 19-22 FOSS Science Stories, <u>Environments</u> , Pages 39-41	12.B.3a Identify and classify biotic and abiotic factors in an environment that affect population density, habitat and placement of organisms in an energy pyramid.	<u>Populations and Ecosystems</u> , Middle School Course

<p>12.B.1b Describe how living things depend on one another for survival.</p>	<p><u>New Plants</u>, Investigation 1, Part 3, Pages 23-30 <u>Insects</u>, Investigation 4, Part 3, Pages 20-22 FOSS Science Stories, <u>Insects</u>, Pages 3-7 FOSS Science Stories, <u>Structures of Life</u>, Page 28</p>	<p>12.B.2b Identify physical features of plants and animals that help them live in different environments (e.g., specialized teeth for eating certain foods, thorns for protection, insulation for cold temperature).</p>	<p><u>Human Body</u>, Investigation 1, Parts 1-3, Pages 1-27 FOSS Science Stories, <u>Human Body</u>, Page 4 FOSS Science Stories, <u>Environments</u>, Pages 17, 18-20, 22</p>	<p>12.B.3b Compare and assess features of organisms for their adaptive, competitive and survival potential (e.g., appendages, reproductive rates, camouflage, defensive structures).</p>	<p><u>Diversity of Life</u> Middle School Course <u>Populations and Ecosystems</u>, Middle School Course</p>
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C. Know and apply concepts that describe properties of matter and energy and the interactions between them.

<p>Benchmarks – Early Elementary</p>	<p>FOSS Activities/ Investigations</p>	<p>Benchmarks – Late Elementary</p>	<p>FOSS Activities/ Investigations</p>	<p>Benchmarks – Middle/Junior High</p>	<p>FOSS Activities/ Investigations</p>
<p>12.C.1a Identify and compare sources of energy (e.g., batteries, the sun).</p>	<p><u>Air and Weather</u>, Investigation 2, Part 2, Pages 14-19 <u>Water</u>, Investigation 4, Part 2, Pages 14-18</p>	<p>12.C.2a Describe and compare types of energy including light, heat, sound, electrical and mechanical.</p>	<p><u>Magnetism and Electricity</u>, Investigation 2, Part 1, Pages 1-13 <u>Physics of Sound</u>, Investigation 1, Part 3, Pages 21-29 <u>Ideas and Inventions</u>, Investigation 4, Parts 1-3, Pages 1-21</p>	<p>12.C.3a Explain interactions of energy with matter including changes of state and conservation of mass and energy.</p>	<p><u>Mixtures and Solutions</u>, Investigation 4, Parts 1-3, Pages 1-24 FOSS Science Stories, <u>Mixtures and Solutions</u>, Page 22 <u>Chemistry</u>, Middle School Course</p>
<p>12.C.1b Compare large-scale physical properties of matter (e.g., size, shape, color, texture, odor).</p>	<p><u>Wood</u>, Activity 1, Parts 1-2, Pages 1-7 <u>Solids and Liquids</u>, Investigation 1, Parts 1-2, Pages 1-20 <u>Pebbles, Sand, and Silt</u>, Investigation 1, Parts 3-4, Pages 18-25 <u>Earth Materials</u>, Investigation 2, Part 1,</p>	<p>12.C.2b Describe and explain the properties of solids, liquids and gases.</p>	<p><u>Water</u>, Investigation 2, Parts 1-3, Pages 1-24 <u>Water</u>, Investigation 3, Parts 1-4, Pages 1-25 FOSS Science Stories, <u>Water</u>, Pages 1-2, 14-15</p>	<p>12.C.3b Model and describe the chemical and physical characteristics of matter (e.g., atoms, molecules, elements, compounds, mixtures).</p>	<p><u>Chemistry</u>, Middle School Course</p>

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D. Know and apply concepts that describe force and motion and the principles that explain them.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
12.D.1a Identify examples of motion (e.g., moving in a straight line, vibrating, rotating).	<u>Balance and Motion</u> , Investigation 3, Parts 1-3 Pages 6-25 FOSS Science Stories, <u>Balance and Motion</u> , Pages 3-9, 14-20, 22-23 <u>Air and Weather</u> , Investigation 3, Parts 1-5, Pages 9-33 FOSS Science Stories, <u>Air and Weather</u> , Pages 3-6, 16, 18-20	12.D.2a Explain constant, variable and periodic motions.	<u>Variables</u> , Investigation 1, Parts 1-3, Pages 1-30 <u>Models and Designs</u> , Investigation 3, Parts 1-3, Pages 1-25	12.D.3a Explain and demonstrate how forces affect motion (e.g., action/reaction, equilibrium conditions, free-falling objects).	<u>Levers and Pulleys</u> , Investigation 1, Parts 1-3, Pages 1-31 <u>Force and Motion</u> , Middle School Course
12.D.1b Identify observable forces in nature (e.g., pushes, pulls, gravity, magnetism).	<u>Balance and Motion</u> , Investigation 3, Parts 1-3, Pages 6-25 FOSS Science Stories, <u>Balance and Motion</u> , Pages 10-13, 21 <u>Air and Weather</u> , Investigation 1, Part 6, Pages 35-38 FOSS Science Stories, <u>Air and Weather</u> , Pages 5-6, 14-17	12.D.2b Demonstrate and explain ways that forces cause actions and reactions (e.g., magnets attracting and repelling; objects falling, rolling and bouncing).	<u>Magnetism and Electricity</u> , Investigation 1, Part 1, Pages 1-16 <u>Models and Designs</u> , Investigation 3, Parts 1-3, Pages 1-25	12.D.3b Explain the factors that affect the gravitational forces on objects (e.g., changes in mass, distance).	<u>Force and Motion</u> , Middle School Course <u>Planetary Science</u> , Middle School Course

E. Know and apply concepts that describe the features and processes of the Earth and its resources.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
12.E.1a Identify components and describe diverse features of the Earth’s land, water and atmospheric systems.	<u>Air and Weather</u> , Investigation 2, Parts 3-4, Pages 22-27 FOSS Science Stories, <u>Air and Weather</u> , Pages 7-13 <u>Water</u> , Investigation 4, Parts 1-3, Pages 1-23 FOSS Science Stories, <u>Earth Materials</u> , Pages 1-4, & 5-7	12.E.2a Identify and explain natural cycles of the Earth’s land, water and atmospheric systems (e.g., rock cycle, water cycle, weather patterns).	FOSS Science Stories, <u>Landforms</u> , Pages 27-34 FOSS Science Stories, <u>Solar Energy</u> , Pages 18-21 FOSS Science Stories, <u>Water</u> , Pages 14-15	12.E.3a Analyze and explain large-scale dynamic forces, events and processes that affect the Earth’s land, water and atmospheric systems (e.g., jetstream, hurricanes, plate tectonics).	<u>Weather and Water</u> , Middle School Course
12.E.1b Identify and describe patterns of weather and seasonal change.	<u>Air and Weather</u> , Investigation 2, Parts 1-4, Pages 1-32; Investigation 4, Parts 1-2, Pages 1-18 FOSS Science Stories, <u>Air and Weather</u> , Pages 14-17, 18-23	12.E.2b Describe and explain short-term and long-term interactions of the Earth’s components (e.g., earthquakes, types of erosion).	<u>Landforms</u> , Investigation 2, Parts 1-2, Pages 1-22 FOSS Science Stories, <u>Landforms</u> , Pages 27-34 FOSS Science Stories, <u>Models and Designs</u> , Pages 11-16	12.E.3b Describe interactions between solid earth, oceans, atmosphere and organisms that have resulted in ongoing changes of Earth (e.g., erosion, El Nino).	<u>Earth History</u> , Middle School Course <u>Weather and Water</u> , Middle School Course
12.E.1c Identify renewable and nonrenewable natural resources.	In All FOSS modules most materials are recycled, even items like plastic cups straws and paper plates. <u>New Plants</u> , Investigation 1, Part 3, Page 28-29 FOSS Science Stories, <u>New Plants</u> , Pages 18-23	12.E.2c Identify and classify recyclable materials.	In All FOSS modules most materials are recycled, even items like plastic cups straws and paper plates. FOSS Science Stories, <u>Water</u> , Pages 17-21 <u>Water</u> , Investigation 4, Math Extensions, Pages 30-31	12.E.3c Evaluate the biodegradability of renewable and nonrenewable natural resources.	<u>Weather and Water</u> , Middle School Course

	FOSS Web Site, FOSSWEB.com, <u>Water</u>				
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F. Know and apply concepts that explain the composition and structure of the universe and Earth’s place in it.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
12.F.1a Identify and describe characteristics of the sun, Earth and moon as familiar objects in the solar system.	<u>Air and Weather</u> , Investigation 2, Parts 1-4, Pages 1-31; Investigation 4, Parts 1-3, Pages 1-26 FOSS Web Site, FOSSWEB.com, <u>Earth Materials</u> , picture	12.F.2a Identify and explain natural cycles and patterns in the solar system (e.g., order of the planets; moon phases; seasons as related to Earth’s tilt, one’s latitude, and where Earth is in its yearly orbit around the sun).	FOSS Science Stories, <u>Models and Design</u> , Pages 5-10 FOSS Web Site, FOSSWEB.com, <u>Solar Energy</u> , Lunar Calendar Activity FOSS Science Stories, <u>Solar Energy</u> , Pages 1-5	12.F.3a Simulate, analyze and explain the effects of gravitational force in the solar system (e.g., orbital shape and speed, tides, spherical shape of the planets and moons).	<u>Planetary Science</u> , Middle School Course
12.F.1b Identify daily, seasonal and annual patterns related to the Earth’s rotation and revolution.	<u>Air and Weather</u> , Investigation 4, Parts 1-3, Pages 1-26 FOSS Science Stories, <u>Air and Weather</u> , Pages 18-23	12.F.2b Explain the apparent motion of the sun and stars.	<u>Solar Energy</u> , Investigation 1, Parts 1-2, Pages 1-21 FOSS Science Stories, <u>Models and Design</u> , Pages 5-10 FOSSWEB.com, <u>Solar Energy</u> , Lunar Calendar Activity	12.F.3b Describe the organization and physical characteristics of the solar system (e.g., sun, planets, satellites, asteroids, comets).	<u>Planetary Science</u> , Middle School Course
		12.F.2c Identify easily recognizable star patterns (e.g., the Big Dipper, constellations).		12.F.3c Compare and contrast the sun as a star with other objects in the Milky Way Galaxy (e.g., nebulae, dust clouds, stars, black holes).	<u>Planetary Science</u> , Middle School Course

STATE GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.

A. Know and apply the accepted practices of science.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
<p>13.A.1a Use basic safety practices (e.g., not tasting materials without permission, “stop/drop/roll”).</p>	<p>All FOSS modules are designed to include safe practices. Where special caution is needed, safety-warning statements are included.</p> <p><u>New Plants</u>, Investigation 1, Part 2, page 17 <u>Air and Weather</u>, Investigation 1, Part 4, Page 24</p> <p>Modules grade three and higher contain safety rules and safety charts along with safety warnings.</p> <p><u>Earth Materials</u>, Overview, Page 17</p>	<p>13.A.2a Demonstrate ways to avoid injury when conducting science activities (e.g., wearing goggles, fire extinguisher use).</p>	<p>Late elementary modules contain safety rules and safety charts along with safety warnings.</p> <p><u>Magnetism and Electricity</u>, Investigation 2, Part 3, Page 24</p> <p><u>Environments</u>, Overview, Page 17</p> <p><u>Landforms</u>, Investigation 1, Part 1, Page 9</p>	<p>13.A.3a Identify and reduce potential hazards in science activities (e.g., ventilation, handling chemicals).</p>	<p><u>Mixtures and Solutions</u>, Investigation 1, part 1, page 11</p> <p><u>Food and Nutrition</u>, Investigation 2, Part 1, Page 10</p> <p><u>Levers and Pulleys</u>, Investigation 1, Science Extensions, Page 31</p> <p><u>Variables</u>, Investigation 1, Part 1, Page 12</p> <p>FOSS Middle School Science Courses each also have safety warning cautions where appropriate.</p>
<p>13.A.1b Explain why similar results are expected when procedures are done the same way.</p>	<p><u>Balance and Motion</u>, Investigation 1, Part 2, Pages 14-18 FOSS Science Stories, <u>Balance and Motion</u>,</p>	<p>13.A.2b Explain why similar investigations may not produce similar results.</p>	<p><u>Magnetism and Electricity</u>, Investigation 1, Part 3, Pages 23-29 <u>Human Body</u>,</p>	<p>13.A.3b Analyze historical and contemporary cases in which the work of science has been</p>	<p>FOSS Science Stories, <u>Variables</u>, pages 4-6 & 12-14 FOSS Science Stories, <u>Mixtures and Solutions</u>,</p>

	Pages 8, 14, 18 <u>Measurement</u> , Investigation 1, Part 1, Pages 1-15 FOSS Science Stories, <u>Measurement</u> , Pages 1-4		Investigation 4, Part 2, Pages 17-19 <u>Models and Designs</u> , Investigation 1, Part 1, Pages 1-17	affected by both valid and biased scientific practices.	Pages 10, 15, 23-25, & 26-30 FOSS Science Stories, <u>Food and Nutrition</u> , Page 26
13.A.1c Explain how knowledge can be gained by careful observation.	<u>Air and Weather</u> , Investigation 2, Part 1, Pages 8-9 <u>Insects</u> , Investigation 1, Part 2, Pages 18-21 FOSS Science Stories, <u>Insects</u> , Pages 3-7 <u>Balance and Motion</u> , Investigation 3, Pages 21-25 FOSS Science Stories, <u>Balance and Motion</u> , Pages 18-21 <u>Earth Materials</u> , Investigation 1, Part 1, Pages 8-15	13.A.2c Explain why keeping accurate and detailed records is important.	<u>Magnetism and Electricity</u> , Investigation 1, Part 3, Pages 24-29 FOSS Science Stories, <u>Magnetism and Electricity</u> , Pages 17-19 FOSS Science Stories, <u>Environments</u> , Pages 23-26	13.A.3c Explain what is similar and different about observational and experimental investigations.	FOSS Science Stories, <u>Variables</u> , pages 4-6 In the module <u>Environments</u> , Investigation 1 is observational and Investigations 3, 5 & 6 are experimental and investigations 2 & 4 have parts that are observational and parts that are experimental. FOSS Middle School Courses will contain both experimental and observational investigations, allowing students to compare and contrast them.

B. Know and apply concepts that describe the interaction between science, technology and society.

Benchmarks – Early Elementary	FOSS Activities/ Investigations	Benchmarks – Late Elementary	FOSS Activities/ Investigations	Benchmarks – Middle/Junior High	FOSS Activities/ Investigations
13.B.1a Explain the uses of common scientific instruments (e.g., ruler, thermometer, balance, probe, computer).	<u>New Plants</u> , Investigation 1, Part 3, Page 24 <u>Air and Weather</u> , Investigation 2, Part 2, Pages 14-19; Part 4, Pages 26-27; Investigation 3, Part 2, Pages 14-16 FOSS Science Stories, <u>Air and Weather</u> , Pages 14-15 <u>Measurement</u> , Investigations 1-4, All Parts, All Pages <u>Earth Materials</u> , Investigation 1, Part 1, Page 12	13.B.2a Explain how technology is used in science for a variety of purposes (e.g., sample collection, storage and treatment; measurement; data collection, storage and retrieval; communication of information).	<u>Magnetism and Electricity</u> , Investigation 5, Part 3, Page 23 FOSS Science Stories, <u>Magnetism and Electricity</u> , Pages 12-15 FOSS Science Stories, <u>Human Body</u> , Pages 5-7 FOSS Science Stories, <u>Physics of Sound</u> , Pages 17-18	13.B.3a Identify and explain ways that scientific knowledge and economics drive technological development.	FOSS Science Stories, <u>Variables</u> , Pages 18-20, & 21-28 FOSS Science Stories, <u>Food and Nutrition</u> , Pages 10-13, 21-23, 24-25 & 34-36 FOSS Science Stories, <u>Mixtures and Solutions</u> , Pages 31-33 Resource Books in the FOSS Middle School Science Courses also address the link between scientific knowledge and technological development.
13.B.1b Explain how using measuring tools improves the accuracy of estimates.	<u>Measurement</u> , Investigation 1, Part 1, Pages 8-15 <u>Measurement</u> , Investigation 2, Part 1, Pages 8-13 <u>Measurement</u> , Investigation 4, Part 1, Pages 8-13	13.B.2b Describe the effects on society of scientific and technological innovations (e.g., antibiotics, steam engine, digital computer).	FOSS Science Stories, <u>Environments</u> , Pages 36, 39-41, 42, & 43-44 FOSS Science Stories, <u>Models and Designs</u> , Pages 25-28, 29-36 & 37-40	13.B.3b Identify important contributions to science and technology that have been made by individuals and groups from various cultures.	FOSS Science Stories, <u>Mixtures and Solutions</u> , Pages 5, 9, 10, 11-13, 15, 22, 23-25, 27, 29, 30, & 31-33 FOSS Science Stories, <u>Levers and Pulleys</u> , Pages 1-4 & 15 Resource Books in the FOSS Middle School Science Courses also address this

<p>13.B.1c Describe contributions men and women have made to science and technology.</p>	<p>FOSS Science Stories, <u>Air and Weather</u>, Page 14 FOSS Science Stories, <u>Pebbles, Sand and Silt</u>, Pages 14-17 FOSS Science Stories, <u>Water</u>, Pages 24-26 FOSS Science Stories, <u>Structures of Life</u>, Pages 4-5 & 6-9</p>	<p>13.B.2c Identify and explain ways that science and technology influence the lives and careers of people.</p>	<p>FOSS Science Stories, <u>Models and Designs</u>, Pages 25-28, 29-36 & 37-40 FOSS Science Stories, <u>Environments</u>, Pages 36, 39-41, 42, & 43-44 FOSS Science Stories, <u>Ideas and Inventions</u>, Pages 1-3, 9, 8, 11-14, 17, 18, 21, & 22</p>	<p>13.B.3c Describe how occupations use scientific and technological knowledge and skills.</p>	<p>FOSS Science Stories, <u>Food and Nutrition</u>, Pages 4, 10-13, 19, & 24-25 FOSS Science Stories, <u>Levers and Pulleys</u>, Pages 5-6, 10-11, 14-15 & 23-25 FOSS Science Stories, <u>Variables</u>, Pages 18-20, & 21-28</p> <p>Resource Books in the FOSS Middle School Science Courses also address occupations and scientific and technological knowledge.</p>
<p>13.B.1d Identify and describe ways that science and technology affect people’s everyday lives (e.g., transportation, medicine, agriculture, sanitation, communication occupations).</p>	<p><u>Pebbles, Sand, and Silt</u>, Investigation 3, Part 1, Pages 9-11 FOSS Science Stories, <u>Pebbles, Sand, and Silt</u>, Pages 14-17 FOSS Science Stories, <u>New Plants</u>, Pages 3, 12-17 FOSS Science Stories, <u>Solids and Liquids</u>, Page 6 FOSS Science Stories, <u>Measurement</u>, Pages 14-15, 18-20, 22-23, & 24-26 FOSS Science Stories, <u>Earth Materials</u>,</p>	<p>13.B.2d Compare the relative effectiveness of reducing, reusing and recycling in actual situations.</p>	<p>All FOSS Modules recycle the materials used in the program</p>	<p>13.B.3d Analyze the interaction of resource acquisition, technological development and ecosystem impact (e.g., diamond, coal or gold mining; deforestation).</p>	<p><u>Weather and Water</u>, Middle School Course</p>

	Pages 12-13				
13.B.1e Demonstrate ways to reduce, reuse and recycle materials.	Materials used in FOSS Modules are recycled. Examples: <u>New Plants</u> , Investigation 1, Part 4, Pages 28-29 <u>Insects</u> , Investigation 4, Part 5, Page 30 <u>Earth Materials</u> , Investigation 1, Part 2, Page 20 FOSS Science Stories <u>Measurement</u> , Page 17	13.B.2e Identify and explain ways that technology changes ecosystems (e.g., dams, highways, buildings, communication networks, power plants).	FOSS Science Stories, <u>Environments</u> , Pages 30, 31-35, 36, 37, & 39-41 FOSS Science Stories, <u>Landforms</u> , Pages 15-21	13.B.3e Identify advantages and disadvantages of natural resource conservation and management programs.	<u>Weather and Water</u> , Middle School Course <u>Earth History</u> , Middle School Course
		13.B.2f Analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems (e.g., lawn and garden care, mass transit).	FOSS Science Stories, <u>Water</u> , Pages 17-21 <u>Water</u> , Investigation 4, Part 3, Pages 19-23 FOSS Science Stories, <u>Environments</u> , Pages 30, 31-35, 36, 37, & 39-41	13.B.3f Apply classroom-developed criteria to determine the effects of policies on local science and technology issues (e.g., energy consumption, landfills, water quality).	<u>Weather and Water</u> , Middle School