



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

**Nebraska
Science Standards**



Nebraska Science Standards

Grades K-1

In the primary grades, students should learn science at their developmental level. Young children develop concepts, vocabulary, and inquiry skills by observing common materials and organisms. When engaged in science inquiry, they develop the ability to ask questions, investigate the world around them, and use their observations to create reasonable explanations for their questions.

FOSS modules are inquiry-based. The fundamentals of scientific inquiry are imbedded in all FOSS modules at a developmentally appropriate level. The following correlation of the Nebraska Science Standards to the Full Option Science System (FOSS) is to show representative examples of investigations from FOSS that address the content standards. A citation does not reflect all of the investigations or activities from FOSS that might address a particular standard.

Note that FOSS modules are developed for grade level clusters of K, 1-2, 3-4 to provide maximum flexibility. Therefore Grades 1-2 FOSS modules may be listed in both the K-1 and 2-4 sections of this correlation.

STANDARD	FOSS INVESTIGATIONS
<p>1.1 Unifying Concepts and Processes</p> <p>Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.</p> <p>1.1.1 By the end of first grade, students will develop an understanding of systems, order, and organization.</p> <p>Student demonstrations:</p> <p>Use one or more of the five senses to observe objects within the student's environment.</p> <p>Use observations to sort objects by their characteristics.</p> <p>1.1.2 By the end of first grade, students will develop an understanding of evidence, models, and explanation.</p>	<p>Wood and Paper Investigation 1, Part 1, pp. 8-14 (wood properties)</p> <p>Fabric Investigation 1, Part 2, pp. 12-15 (fabric hunt)</p> <p>Pebbles, Sand, and Silt Investigation 1, Part 2, pp. 13-17 (washing rocks)</p> <p>Plants and Animals Investigation 1, Part 3, pp. 63-72 (wheat)</p> <p>Trees Investigation 2, Part 2, pp. 10-15 (leaf shapes)</p> <p>Solids and Liquids Investigation 2, Parts 1-3, pp. 10-27 (liquid properties)</p> <p>Pebbles, Sand, and Silt Investigation 1, Parts 3-4, pp. 18-25 (sorting games)</p>

<p>Student demonstration:</p> <p>Describe and record how a model, such as photos, maps, globes, illustrations, stuffed animals, toys, and building blocks can represent an object, living thing, or an event.</p> <p>1.1.3 By the end of first grade, students will develop an understanding of change, constancy, and measurement.</p> <p>Student demonstrations:</p> <p>Recognize that change can be noted and measured.</p> <p>Recognize that things change in some ways and stay the same in others.</p> <p>Compare two or more objects using direct comparisons of measurement, such as</p>	<p>Animals Two by Two Investigation 1, Part 3, pp. 22-25 (goldfish tank model)</p> <p>Air and Weather Investigation 1, Part 6, pp. 34-38 (balloon rockets)</p> <p>Solids and Liquids Investigation 1, Part 3, pp. 21-24 (towers of solids)</p> <p>Insects and Plants Investigation 1, Part 3, pp. 71-75 (observing growth)</p> <p>Wood and Paper Investigation 1, Parts 4-5, pp. 24-32 (floating and sinking wood) <u>Wood and Paper FOSS Science Stories</u> pp. 3-8, 13-18</p> <p>New Plants Investigation 1, Parts 1-3, pp. 8-30 (fast plants)</p> <p>Air and Weather Investigation 4, Part 2, pp. 12-18 (comparing seasons) <u>Air and Weather FOSS Science Stories</u> pp. 14-15</p> <p>Plants and Animals Investigation 2, Parts 1-3, pp. 87-108 (stems)</p> <p>Insects and Plants Investigation 2, Part 3, pp. 105-115 (observing growth)</p> <p>Trees Investigation 3 (Trees Through the Seasons) <u>Trees FOSS Science Stories</u> pp. 14-24</p> <p>Fabric Investigation 2, Part 2, pp. 12-17 (washing fabric) <u>Fabric FOSS Science Stories</u> pp. 3-15</p> <p>Pebbles, Sand, and Silt Investigation 3, Part 4, pp. 20-23 (clay beads)</p> <p>Insects Investigation 1, Parts 1-3, pp. 8-25 (mealworm life cycle) <u>Insects FOSS Science Stories</u> pp. 16-21</p> <p>Plants and Animals Investigation 1, Part 3, pp. 63-72 (wheat)</p> <p>Insects and Plants Investigation 5, Parts 1-3, pp. 219-227 (butterflies)</p> <p>Animals Two by Two Investigation 3, Part 3, pp. 17-20 (red worms)</p>
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<p>shorter, longer, taller, heavier, and lighter.</p> <p>Use both standard units of measurement, such as inches and centimeters, and nonstandard units of measurement, such as string and paper clips.</p> <p>Use appropriate measurement systems for different purposes.</p> <p>1.1.4 By the end of first grade, students will develop an understanding of form and function.</p> <p>Student demonstrations:</p> <p>Demonstrate how the shape of a tool is related to its use.</p> <p>Explain how living things interact with their environment because of specific characteristics, such as how the long neck of the giraffe helps it to reach its food.</p>	<p>and night crawlers)</p> <p>Balance and Motion Investigation 2, Part 3, pp. 20-25 (twirlers)</p> <p>Solids and Liquids Investigation 2, Parts 1-2 (many comparisons)</p> <p>Wood and Paper Investigation 1, Parts 4-5, pp. 24-32 (paper clip weights)</p> <p>Air and Weather Investigation 2, Parts 1-4, pp. 8-27 (weather measures)</p> <p>New Plants Investigation 1, Part 3, pp. 23-30 ext. (plant heights)</p> <p>Insects and Plants Investigation 2, Part 3, pp. 105-115 (observing growth)</p> <p>New Plants Investigation 1, Part 3, pp. 23-30</p> <p>Insects Investigations 1-5 extensions/time lines</p> <p>Air and Weather Investigation 2, Parts 2,4, p. 14-19, 24-27</p> <p>Insects and Plants Investigation 2, Part 3, pp. 105-115 (observing growth)</p> <p>Wood and Paper Activity 4, Parts 1 and 2, pp. 8-18 (paper recycling tools)</p> <p>Pebbles, Sand, and Silt Investigation 2, Part 1, pp. 8-13 (screens)</p> <p>Solids and Liquids Investigation 3, Part 2, pp. 14-18 (screens, other tools)</p> <p>Air and Weather Investigation 2, Part 4, pp. 24-27 (rain gauge)</p> <p>Animals Two by Two Investigation 2, Parts 1-4, pp. 9-24 (snails)</p> <p>New Plants Investigation 2, Part 3, pp. 20-28 (wheat in a straw)</p> <p>New Plants <u>FOSS Science Stories</u> pp. 18-23</p> <p>Insects Investigation 4, Part 5, pp. 28-31 (silkworms)</p> <p>Insects <u>FOSS Science Stories</u> pp.8-11</p> <p>Plants and Animals <u>FOSS Science Resources</u> pp. 16-19, 28-36, 41-45, 47-50</p>
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<p>1.2 Science as Inquiry</p> <p>Science as inquiry requires students to combine processes and scientific knowledge with scientific reasoning and critical thinking to develop their understanding of science.</p> <p>1.2.1 By the end of first grade, students will develop the abilities needed to do scientific inquiry.</p> <p>Student demonstrations:</p> <p>Ask questions about their surroundings.</p> <p>Plan and conduct a simple investigation.</p> <p>Collect scientific information from careful observation.</p>	<p>Insects and Plants Investigation 5, Parts 1-3, pp. 219-227 (butterflies) <u>Insects and Plants FOSS Science Resources</u> pp. 4, 7, 26-29</p> <p>Animals Two by Two Investigation 1, Part 2, pp. 17-21 (fish) Trees Investigation 1, Parts 1, 7-8, pp. 7-14, 31-37 (trees) Trees FOSS Science Stories pp. 3-5, 12-13 <u>Wood and Paper FOSS Science Stories</u> pp. 9-12 New Plants Investigation 2, Part 2, pp. 15-19 (lawns) Balance and Motion Investigation 2, Part 1, pp. 8-13 (spinning tops) Plants and Animals Investigation 4, Parts 1-2, pp. 151-163 (bulbs and roots) Insects and Plants Investigation 3, Parts 1-3, pp. 129-151 (milkweed bugs)</p> <p>Wood and Paper Investigation 1, Part 4, pp. 24-27 (sinking pine & plywood) Solids and Liquids Investigation 4, Part 3, pp. 23-27 (toothpaste) New Plants Investigation 4, Parts 1-2, pp. 7-19 (planting roots) Plants and Animals Investigation 1, Parts 1-2, pp. 47-62 (lawns)</p> <p>Trees Investigation 2, Part 3, pp. 16-19 (comparing leaves) Air and Weather Investigation 1, Part 4, pp. 21-26 (pushing on air) Pebbles, Sand, and Silt Investigation 1, Parts 1-2, pp. 8-17 (rock studies) Plants and Animals Investigation 1, Part 3, pp. 63-72 (wheat)</p>
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<p>Use simple equipment and tools, such as magnifying glasses, thermometers, and balance scales, to extend the senses.</p> <p>Share findings with classmates, families, and community members.</p> <p>1.3 Physical Science</p> <p>Physical science focuses on science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p> <p>1.3.1 By the end of first grade, students will develop an understanding of the characteristics of materials.</p> <p>Student demonstrations:</p> <p>Observe and describe characteristics of common materials, such as paper, wood, metal, and wool.</p> <p>Investigate how common materials will float, sink, mix, dissolve, or not dissolve in various liquids.</p>	<p>Fabric Investigation 1, Part 4, pp. 20-22 (weaving)</p> <p>Pebbles, Sand, and Silt Investigation 1, Parts 1-3, pp. 8-21 (lenses)</p> <p>Insects ALL investigations (hand lenses)</p> <p>Air and Weather Investigation 2, Parts 1-4, pp. 8-17 (weather tools)</p> <p>Insects and Plants Investigation 1, Parts 1-3, pp. 52-75 (hand lenses)</p> <p>Animals Two by Two Investigation 2, Part 2, pp. 14-17 (snail races)</p> <p>Balance and Motion Investigation 3, Part 1, pp. 6-12 (rolling wheels)</p> <p>Insects Investigation 1, Part 2, pp. 16-21 (mealworms)</p> <p>Plants and Animals Investigation 2, Parts 1-3, pp. 87-108 (stems)</p> <p>Insects and Plants Investigation 5, Parts 1- 3, pp. 206-227 (butterflies)</p> <p>Wood and Paper ALL, such as Investigation 1 (wood properties) Investigation 3 (paper properties)</p> <p>Fabric Investigation 1, Parts 1-2, pp. 6-15 (fabric)</p> <p>Fabric FOSS Science Stories pp. 3-24</p> <p>Solids and Liquids Investigation 1, Part 1, pp. 8-16 (solids properties) Investigation 2, Parts 1-3, pp. 10-27 (liquids)</p> <p>Solids and Liquids FOSS Science Stories pp. 6-13</p> <p>Fabric Investigation 2, Part 1, pp. 7-11 (water and fabric)</p> <p>Pebbles, Sand, and Silt Investigation 2, Part 3, pp. 18-23 (sand and silt in water)</p> <p>Solids and Liquids Investigation 4, Parts 1-2, pp. 7-21 (solids and</p>
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<p>Observe that materials can exist as a solid, liquid, or gas.</p> <p>1.4 Life Science</p> <p>Life science focuses on science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p> <p>1.4.1 By the end of first grade, students will develop an understanding of the characteristics of living things.</p> <p>Student demonstrations:</p> <p>Differentiate between living and nonliving things.</p> <p>Investigate how living things need food, water, and air to survive.</p>	<p>liquids in water) <u>Solids and Liquids</u> FOSS Science Stories pp.18-23 “Mix it Up”</p> <p>Wood and Paper Investigation 4, Parts 1-2, pp. 8-18 (recycling and paper mache) Solids and Liquids Investigations 1 and 2 (solids and liquids) <u>Solids and Liquids</u> FOSS Science Stories pp. 3-17 Air and Weather Investigation 1, Parts 1-2, 4-5, pp. 8-16, 21-33</p> <p>Animals Two by Two Investigation 2, Part 4, pp. 22-24 (shells) New Plants Investigation 1, Part 1, pp. 8-12 (Brassica seeds) Insects Investigation 1, Part 3, pp. 22-25 (insect pupae) Investigation 3, Part 1, pp. 8-11 (milkweed bug eggs) <u>Pebbles, Sand, and Silt</u> FOSS Science Stories pp. 18-21 (soil components) Plants and Animals Investigation 3, Parts 1-2, pp. 120-140 (terrariums) Insects and Plants Investigation 1, Part 3, pp. 71-75 (life cycle) Investigation 2, Part 1, pp. 91-94 (brassica seeds) Investigation 3, Part 1, pp. 129-133 (eggs)</p> <p>Animals Two by Two Investigation 1, Part 1, pp. 10-16 (fish needs) Insects Investigation 3, Part 2, pp. 12-20 (milkweed bug habitats) New Plants Investigation 1, Part 2, pp. 13-22 (fast plant needs) Plants and Animals Investigation 1, Part 1, pp. 47-57 (lawns) Investigation 3, Parts 1-2, pp. 120-134</p>
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<p>Describe how roots, stems, and leaves serve different functions for plants.</p>	<p>(terrarium) Plants and Animals FOSS Science Resources pp. 3-7, 21-23 Insects and Plants Investigation 1, Part 1, pp. 52-61 (mealworms) Investigation 4, Part 2, pp.170-174 (roots) Trees Investigation 1, Parts 1-6, pp. 7-30 (tree parts) Investigation 2 ALL (leaves) New Plants ALL, such as Investigation 1, Part 3, pp. 23-30 (fast plant parts) Investigation 2, Part 3, pp. 20-28 (wheat in a straw) Investigation 4, Part 2, pp. 13-19 (planting roots) New Plants FOSS Science Stories pp. 4, 6, 7, 20, 23 Plants and Animals Investigation 2, Parts 1-3, pp. 87-108 (stems) Investigation 4, Parts 1-2, pp. 151-163 (roots) Plants and Animals FOSS Science Resources pp. 3-7, 28, 34, 43 Insects and Plants Investigation 2, Part 3, pp. 91-115 (brassica seeds)</p>
<p>Compare and contrast animals by specific characteristics, such as body covering, diet, and habitat.</p>	<p>Animals Two by Two ALL Investigations 1-5 Animals Two by Two FOSS Science Stories pp. 3-24 Insects ALL Investigations 1-6 Insects FOSS Science Stories pp. 3-11, 16-23 Plants and Animals FOSS Science Resources pp. 2-23, 29-30, 32-33,35-35-36, 39, 41-42, 44-45, 47-50 Insects and Plants Investigation 1, 3-5, all parts Insects and Plants FOSS Science Resources pp. 30-33</p>
<p>Observe and recognize that organisms live and survive in distinct habitats.</p>	<p>Animals Two by Two Investigations 1, 3 (fish and worms) Insects ALL, such as Investigation 3 (milkweed bug habitats) Investigation 5 (caterpillars/butterflies) Investigation 6 (other insects ex. aquatic) New Plants Investigation 1, Parts 2-3, pp. 13-30 (fast plants) New Plants FOSS Science Stories pp. 18-23 Plants and Animals Investigation 3, Parts 1-2, pp. 120-134 (terrariums) Plants and Animals FOSS Science Resources pp. 28-45 Insects and Plants Investigation 3, Part 2, pp.</p>

<p>1.4.2 By the end of first grade, students will develop an understanding of the life cycles of organisms.</p> <p>Student demonstrations:</p> <p>Describe how living things change as they grow.</p> <p>Describe how offspring resemble their parents.</p> <p>1.5 Earth and Space Science</p> <p>Earth and space science focuses on science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p> <p>1.5.1 By the end of first grade, students will develop an understanding of the characteristics of earth materials.</p>	<p>134-144 (habitats) <u>Insects and Plants</u> FOSS Science Resources pp. 3-7, 26-29, 48-55</p> <p>Animals Two by Two Investigation 1 (fish) Investigation 5 (optional – chicks) New Plants ALL Investigations 1-4 (many types of plants) <u>New Plants</u> FOSS Science Stories pp. 8-15 Insects ALL, such as Investigations 1, 3, 5 Plants and Animals Investigation 1, Parts 1-3, pp. 47-72 (grass and grain seeds) Investigation 2, Parts 1-3, pp. 87-108 (stems) <u>Plants and Animals</u> FOSS Science Resources pp. 28-45 Insects and Plants Investigation 1-5, all parts <u>Insects and Plants</u> FOSS Science Resources pp. 37-55</p> <p>Animals Two by Two Investigation 1, Part 4, pp. 26-29 (guppies) <u>Animals Two by Two</u> FOSS Science Stories pp. 20-24 New Plants Investigation 1 (fast plant life cycle) <u>New Plants</u> FOSS Science Stories pp. 8-15 Insects ALL, such as Investigations 1, 3, 5 (Insect life cycles) <u>Insects</u> FOSS Science Stories pp. 16-21 Plants and Animals Investigation 2, Parts 1-3, pp. 87-108 (stems) Insects and Plants Investigation 2, Parts 1-3, pp. 91-115 (brassica seeds) Investigation 3, Parts 1-3, pp. 129-151 (milkweed bugs) <u>Insects and Plants</u> FOSS Science Resources pp. 8-10, 20-24, 42</p>
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<p>Student demonstrations:</p> <p>Observe that materials of the earth, such as water, support life.</p> <p>Observe that the earth's surface is made up of a variety of rocks, minerals, and soils.</p> <p>1.5.2 By the end of first grade, students will develop an understanding of the objects in the sky.</p> <p>Student demonstrations:</p> <p>Recognize objects in the sky, such as the sun, moon, and stars.</p> <p>Recognize that the sun provides heat and light.</p> <p>1.5.3 By the end of first grade, students will develop an understanding of the changes in the earth and sky.</p> <p>Student demonstrations:</p> <p>Describe daily weather changes.</p> <p>Describe seasonal weather changes.</p> <p>1.6 Science and Technology</p> <p>An understanding of science and technology establishes connections between the natural</p>	<p>Animals Two by Two Investigation 1 (fish in water) Investigation 3 (worms in soil) <u>Animals Two by Two FOSS Science Stories</u> pp. 3-24 (animals in various habitats)</p> <p>New Plants ALL Investigation 1-4 (plants in soil and water) <u>Pebbles, Sand, and Silt FOSS Science Stories</u> pp.18-20</p> <p>Pebbles, Sand, and Silt Investigation 1, 2, 4 ALL <u>Pebbles, Sand and Silt FOSS Science Stories</u> pp.1-3, 18-21</p> <p>Air and Weather Investigation 4, Part 3, pp. 19-24</p> <p>Air and Weather Investigation 2, Part 2, pp. 14-19 <u>Air and Weather FOSS Science Stories</u> pp. 7,10,21</p> <p>New Plants Investigation 1, Part 2, pp. 13-22 (light needed for plants) <u>New Plants FOSS Science Stories</u> p. 6</p> <p>Insects and Plants Investigation 2, Part 2, pp. 95-104 (light for plants)</p> <p>Air and Weather Investigations 2, 3 Investigation 4, Part 1, pp. 8-11 <u>Air and Weather FOSS Science Stories</u> pp. 7-13</p> <p>Air and Weather Investigation 4, Parts 1-2,, pp. 8-18 <u>Air and Weather FOSS Science Stories</u> pp.18-21</p>
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<p>and designed world, linking science and technology.</p> <p>1.6.1 By the end of first grade, students will develop an understanding of technological design.</p> <p>Student demonstration:</p> <p>Explain how the use of common household tools is determined by their design.</p> <p>1.6.2 By the end of first grade, students will develop an understanding of science and technology.</p> <p>Student demonstrations:</p> <p>Use various tools, such as a magnifying glass, thermometer, or measuring tape, to improve observations and measurements.</p> <p>Identify, investigate, and solve a problem in the home or school.</p> <p>Identify the technology used in different occupations.</p> <p>1.7 Science in Personal and Social Perspectives</p> <p>A personal and social perspective of science</p>	<p>Wood and Paper Investigation 2, Parts 3-4, pp. 16-23 <u>Wood and Paper FOSS Science Stories</u> pp. 3-8</p> <p>Balance and Motion Investigation 2, Part 1, pp. 8-13 (tops) <u>Balance and Motion FOSS Science Stories</u> pp. 3-24</p> <p>New Plants Investigation 1, Part 2, pp. 13-22 (grow light for plants)</p> <p>Fabric Investigation 1, Part 4, pp. 20-22</p> <p>Pebbles, Sand, and Silt Investigation 1, Parts 1-3, pp. 8-21 (hand lenses) Insects ALL (hand lenses) Air and Weather Investigation 2, Parts 1-4, pp. 8-17 (weather tools)</p> <p>Wood and Paper Investigation 5, Part 3, pp. 18-21 (sculptures)</p> <p>Solids and Liquids Investigation 4, Part 3, pp. 23-27</p> <p>Pebbles, Sand, and Silt Investigation 3, Parts 4-5, pp. 20-29 Note: this standard is also met in most of the Home/School Connections, which are provided for ALL FOSS modules)</p> <p><u>Air and Weather FOSS Science Stories</u> pp. 14-15 and “Meteorologist Tool Kit” extension <u>Pebbles, Sand, and Silt FOSS Science Stories</u> pp. 14, 16, 17 <u>New Plants FOSS Science Stories</u> pp.14-16 FOSS Web site: www.fossweb.com “Careers”</p>
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<p>helps a student to understand and act on personal and social issues. This perspective builds a foundation for future decision making.</p> <p>1.7.1 By the end of first grade, students will develop an understanding of personal health.</p> <p>Student demonstrations:</p> <p style="padding-left: 40px;">Follow safety rules for home and school.</p> <p style="padding-left: 40px;">Engage in personal care that will maintain and improve health.</p> <p style="padding-left: 40px;">Describe a healthy diet.</p> <p style="padding-left: 40px;">Explain that substances can benefit or damage the way the body functions.</p> <p>1.7.2 By the end of first grade, students will develop an understanding of resources.</p> <p>Student demonstration:</p> <p style="padding-left: 40px;">Observe and describe how reducing, reusing, and recycling help our environment.</p> <p>1.8 History and Nature of Science</p> <p>The history and nature of science illustrates different aspects of scientific inquiry, the human aspects of science, and the role that science has played in the development of various cultures.</p> <p>1.8.1 By the end of first grade, students will develop an understanding of science as a human endeavor.</p>	<p>Safety rules are a top priority in FOSS modules. The “Overview” section of EACH FOSS Teacher Guide has a special section on safety. Safety posters are provided in each kit. Within each lesson plan, special safety precautions are denoted with a safety goggle icon. See for example: Air and Weather Overview p. 17 and Investigation 1, Part 4 pp. 22-25</p> <p>Wood and Paper Investigation 4, Part 1, pp. 8-13 (paper recycling) <u>Wood and Paper FOSS Science Stories</u> pp. 19-24 Insects and Plants Investigation 2, Part 3, pp. 105-115 (soil recycling) Note also that conservation of materials is stressed in each teacher manual. Even items like sand, paper plates and solo cups are re-used as long as they can be.</p>
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<p>Student demonstrations:</p> <p>Recognize the contributions to science made by men and women from many countries.</p> <p>Conduct an investigation as an individual.</p> <p>Conduct an investigation as part of a team.</p>	<p>Fabric Investigation 2, Part 3, pp. 18-21 (dyeing fabric) Fabric FOSS Science Stories pp. 3-24 FOSS Web Site: www.fossweb.com "Careers"</p> <p>Animals Two by Two Investigation 2, Part 2, pp. 14-17 snail races Wood and Paper Investigation 3, Part 1, pp. 8-12</p> <p>Insects Investigation 1, Parts 1-3, pp. 8-25 (mealworms)</p> <p>Solids and Liquids Investigation 1, Part 1, pp. 8-16 (exploring solids)</p> <p>Insects and Plants Investigation 1, Parts 1-3, pp. 52-75 (mealworms)</p> <p>Pebbles, Sand, and Silt Investigation 4, Part 2, pp. 15-18 (soil search)</p> <p>Solids and Liquids Investigation 1, Part 2, pp. 17-20 (solids properties)</p> <p>Insects Investigation 3, Parts 1-3, pp. 8-26 (milkweed bugs)</p> <p>Balance and Motion Investigation 3, Part 3, pp. 19-25 (rolling spheres)</p> <p>Insects and Plants Investigation 3, Parts 1-3, pp. 129-151 (milkweed bugs)</p>
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Nebraska Science Standards

Grades 2-4

In the intermediate grades, students learn science concepts, vocabulary, and inquiry skills at their developmental level. Students should develop knowledge and process skills while engaged in science inquiry. They should ask simple questions, design and conduct investigations (in the form of a "fair" test), and present their results to others.

FOSS modules are inquiry-based. The fundamentals of scientific inquiry are imbedded in all FOSS modules at a developmentally appropriate level. The following correlation of the Nebraska Science Standards to the Full Option Science System (FOSS) is to show representative examples of investigations from FOSS that address the content standards. A citation does not reflect all of the investigations or activities from FOSS that might address a particular standard.

Note that FOSS modules are developed for grade level clusters of K, 1-2, 3-4 to provide maximum flexibility. Therefore Grades 1-2 FOSS modules may be listed in both the K-1 and 2-4 sections of this correlation.

STANDARD	FOSS
<p>4.1 Unifying Concepts and Processes</p> <p>Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.</p> <p>4.1.1 By the end of fourth grade, students will develop an understanding of systems, order, and organization.</p> <p>Student demonstrations:</p> <p>Describe the parts that make up a system.</p> <p>Relate how the parts of a system affect the whole system.</p>	<p>Insects and Plants Investigation 1, Part 1, pp. 52-61 (mealworms)</p> <p>Structures of Life, ALL, such as Investigation 2, Parts 1-3, pp. 8-22 (bean plants)</p> <p>Human Body ALL, such as Investigation 1, Parts 1-2, pp. 8-20 (skeletal system)</p> <p>Investigation 3 (muscles)</p> <p>Human Body <u>FOSS Science Stories</u> pp. 1-3,14-16,28-29</p> <p>Magnetism and Electricity Investigation 2, Parts 1-3, pp. 8-25 (circuits)</p> <p>Sun, Moon and Stars Investigation 2, Part 2, pp. 89-100 (phases of the moon)</p> <p>Matter and Energy Investigation 1, Parts 1-3, pp. 50-82 (energy)</p> <p>Insects and Plants Investigation 1, Part 1, pp. 52-61 (mealworms)</p> <p>Water Investigation 4, Part 2, pp. 14-18</p>

<p>4.1.2 By the end of fourth grade, students will develop an understanding of evidence, models, and explanation.</p> <p>Student demonstrations:</p> <p>Use evidence gathered from an investigation to develop a scientific explanation.</p> <p>Create a model, graph, or illustration that represents an object, living thing, or an event in the student's environment.</p> <p>Explain and answer questions about the model created and how it represents a part of their environment.</p> <p>Use a variety of ways, such as sketches, charts, and graphs, to explain procedures or ideas.</p>	<p>(waterwheels)</p> <p>Magnetism and Electricity Investigation 3, Parts 1-2, pp. 10-21 (circuits)</p> <p>Human Body Investigation 3, Parts 1-3, pp. 8-21 (muscles, joints, and bones)</p> <p>Sun, Moon and Stars Investigation 2, Part 2, pp. 89-100 (phases of the moon)</p> <p>Matter and Energy Investigation 1, Parts 1-3, pp. 50-82 (energy)</p> <p>Plants and Animals Investigation 1, Part 2, pp. 58-62 (mowing the lawn)</p> <p>Balance and Motion Investigation 2, Part 3, pp. 20-25 (twirlers)</p> <p>Earth Materials Investigation 3, Part 1, pp. 8-13 (calcite quest)</p> <p>Physics of Sound Investigation 3, Part 1, pp. 8-14 (sounds through air and water)</p> <p>Sun, Moon and Stars Investigation 1, Parts 1-2 (the sun)</p> <p>Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)</p> <p>Insects and Plants Investigation 1, Part 3, pp. 71-75 (life cycle)</p> <p>Air and Weather Investigation 1, Part 6, pp. 34-38 (balloon rockets)</p> <p>Magnetism and Electricity Investigation 4, Part 1, pp. 8-13 (electromagnets)</p> <p>Human Body Investigation 3, Parts 1-3, pp. 8-21 (leg, thumb models)</p> <p>Sun, Moon and Stars Investigation 2, Part 2, pp. 89-100 (phases of the moon)</p> <p>Insects and Plants Investigation 1, Part 3, pp. 71-75 (life cycle)</p> <p>Air and Weather Investigation 1, Part 6, pp. 34-38</p> <p>Human Body Investigation 3, Parts 1-3, pp. 8-21</p> <p>Magnetism and Electricity Investigation 4, Part 1, pp. 8-13</p> <p>Sun, Moon and Stars Investigation 2, Part 2, pp. 89-100 (phases of the moon)</p> <p>Ideas and Inventions Investigation 2, Parts 1-2, pp. 8-19 (fingerprints)</p>
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<p>4.1.3 By the end of fourth grade, students will develop an understanding of change, constancy, and measurement.</p> <p>Student demonstrations:</p> <p>Describe observable changes, such as speed, pattern, shape, position, and size.</p> <p>Measure a change using appropriate tools and units of measurement.</p> <p>4.1.4 By the end of fourth grade, students will develop an understanding of form and function.</p> <p>Student demonstration:</p> <p>Construct a device to perform a simple task and explain how it works.</p>	<p>Water Investigation 3, Part 2, pp. 12-16 (evaporation)</p> <p>Structures of Life Investigation 2, Part 3, pp. 18-22 (bean life cycle)</p> <p>Matter and Energy Investigation 3, Parts 2-3, pp. 139-160 (matter)</p> <p>Plants and Animals Investigation 1, Part 3, pp. 63-71 (wheat)</p> <p>Insects and Plants Investigation 5, Parts 1-3, pp. 206-227 (butterflies)</p> <p>Balance and Motion Investigation 3, Part 1, pp. 6-12 (rolling cups)</p> <p>Water Investigation 2, Parts 1-2, pp. 8-18 (water movement)</p> <p>Physics of Sound Investigation 2, Parts 1-3, pp. 8-24 (sound movement)</p> <p>Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)</p> <p>Insects and Plants Investigation 2, Part 3, pp. 105-115 (brassica seeds)</p> <p>Air and Weather Investigation 2, Parts 2, 4, pp. 14-19, 24-27 (weather tools)</p> <p>Measurement ALL, such as Investigation 2, Part 3, pp. 18-24 (sponges/mass) Investigation 4, Part 2, pp. 14-17 (temperature change)</p> <p>Structures of Life Investigation 2, Part 3, pp. 18-22 (bean length change)</p> <p>Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter) Investigation 4, Part 1, pp. 174-180 (temperature)</p> <p>Balance and Motion Investigation 3, Part 2, pp. 13-18 (rolling cup tricks)</p> <p>Human Body</p>
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<p>4.2 Science As Inquiry</p> <p>Science as inquiry requires students to combine processes and scientific knowledge with scientific reasoning and critical thinking to develop their understanding of science.</p> <p>4.2.1 By the end of fourth grade, students will develop the abilities needed to do scientific inquiry.</p> <p>Student demonstrations:</p> <p>Ask a question about objects, organisms, and events in their surroundings.</p> <p>Plan and conduct a simple investigation.</p> <p>Employ simple equipment and tools to gather data and extend the senses.</p>	<p>Investigation 3, Parts 1-3, pp. 8-21 (leg, thumb model)</p> <p>Water Investigation 4, Part 2, pp. 14-18 (waterwheel)</p> <p>Matter and Energy Investigation 1, Part 1, pp. 50-62 (energy sources)</p> <p>New Plants Investigation 2, Part 2, pp. 15-20 (lawns)</p> <p>Insects and Plants Investigation 3, Parts 1-3, pp. 129-151 (milkweed bugs)</p> <p>Human Body Investigation 4, Part 4, pp. 25-29 (projects)</p> <p>Magnetism and Electricity Investigation 4, Part 2, pp. 14-18 (electromagnets)</p> <p>Sun, Moon and Stars Investigation 1, Part 2, pp. 56-64 (shadow tracking)</p> <p>Matter and Energy Investigation 2, Part 1, pp. 93-102 (reflected light)</p> <p>Solids and Liquids Investigation 4, Part 3, pp. 23-27 (toothpaste)</p> <p>Plants and Animals Investigation 1, Part 3, pp. 63-72 (wheat)</p> <p>Physics of Sound Investigation 1, Parts 1-3, pp. 8-29 (drop codes)</p> <p>Ideas and Inventions Investigation 4, Part 4, pp. 22-25 (projects)</p> <p>Sun, Moon and Stars Investigation 1, Part 2, pp.56-64 (shadow tracking)</p> <p>Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)</p> <p>Pebbles, Sand, and Silt Investigation 1, Parts 1-3, pp. 8-21 (hand lenses)</p> <p>Insects and Plants Investigation 5, Parts 1-3, pp. 206-227 (butterflies)</p> <p>Measurement ALL, such as Investigation 2, Parts 1-2, pp. 8-17 (balances)</p>
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<p>Use data to support explanations.</p> <p>Communicate procedures, results, and explanations of an investigation.</p> <p>4.3 Physical Science</p> <p>Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p>	<p>Investigation 4, Parts 1-2, pp. 8-17 (thermometers) Water Investigation 3, Parts 1-3, pp. 8-20 (graduates) Structures of Life Investigation 4, Part 3, pp. 20-24 Sun, Moon and Stars Investigation 1, Part 1, pp. 42-55 (follow the sun) Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter) Investigation 4, Part 1, pp. 174-180 (temperature)</p> <p>Plants and Animals Investigation 1, Part 2, pp. 58-62 (mowing the lawn) Earth Materials Investigation 2, Part 2, pp. 14-21 (hardness testing) Water Investigation 3, Part 3, pp. 17-20 (evaporation) Ideas and Inventions Investigation 3, Parts 1-2, pp. 8-17 (chromatography) Sun, Moon and Stars Investigation 1, Part 2, pp. 56-64 (shadow tracking) Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)</p> <p>This standard is met throughout ALL FOSS modules as students write in their lab journals and as the class discusses the lesson around the Word Bank and Content/Inquiry bank. It is also met in the end of module projects such as the following:</p> <p>Plants and Animals Investigation1, Part 3, pp. 63-72 (wheat) Structures of Life Investigation 4, Part 4, pp. 25-29 (projects) Physics of Sound Investigation 4, Part 2, pp. 16-20 Earth Materials Investigation 4, Part 2, pp. 14-18 Sun, Moon and Stars Investigation 1, Part 2, pp. 56-64 (shadow tracking) Matter and Energy Investigation 3, Parts 2-3, pp. 139-160 (matter)</p>
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4.3.1 By the end of fourth grade, students will develop an understanding of the characteristics of objects and materials.

Student demonstrations:

Classify objects by observable characteristics, such as shape, size, and color.

Investigate characteristics of common materials using tools, such as rulers, balances, thermometers, microscopes, and hand lenses.

Observe that materials can change from solid to liquid to gas by heating and from gas to liquid to solid by cooling.

4.3.2 By the end of fourth grade, students will develop an understanding of the position and motion of objects.

Student demonstrations:

Use reference points to describe the position of an object.

Indicate an object's motion by tracing its

Pebbles, Sand, and Silt

Investigation 1, Part 4, pp. 22-25 (3 rock types)

Solids and Liquids

Investigation 1, Part 1, pp. 8-16 (solids properties)

Investigation 2, Parts 1-2, pp. 10-20 (liquids)

Magnetism and Electricity

Investigation 1, Part 1, pp. 8-17 (magnetic properties)

Matter and Energy Investigation 3, Part 1, pp. 139-150 (matter)

Air and Weather

Investigation 2, Parts 2,4, pp. 14-19, pp. 24-27 (weather tools)

Earth Materials

Investigation 2, Part 2, pp. 14-21 (hardness testing)

Water

Investigation 2, Part 1, pp. 8-13 (home-made thermometers)

Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)

Water

Investigation 3, Parts 1-4, pp. 8-26

Water FOSS Science Stories pp.14-16

FOSS Web Site: www.fossweb.com

"Evaporation" activity

Matter and Energy Investigation 4, Part 2, pp. 181-192 (melting/evaporation)

Matter and Energy FOSS Science

Resources pp.54-56

Balance and Motion

Investigation 1, Parts 1-4, pp. 8-28 (balancing shapes)

Human Body

Investigation 1, Part 2, pp. 16-20 (bone locations)

Measurement

Investigation 2, Parts 1-2, pp. 8-17 (balance locations)

Balance and Motion

<p>position over time.</p> <p>Observe that the position and motion of objects can be changed by pushing or pulling.</p> <p>Demonstrate how sound is produced when objects vibrate.</p> <p>Change the pitch of sound by changing the rate of vibration.</p> <p>4.3.3 By the end of fourth grade, students will develop an understanding of light, heat, electricity, and magnetism.</p> <p>Student demonstrations:</p> <p>Distinguish between reflection and refraction of light.</p> <p>Recognize heat can be produced in many ways, such as burning, rubbing, or mixing one substance with another.</p> <p>Demonstrate heat can flow from one object to another by conduction.</p>	<p>Investigation 3, Parts 1-3, pp. 6-25 (rollers) Human Body Investigation 3, Parts 1-3, pp. 8-21 (muscle movement) Measurement section of www.fossweb.com FOSS Web Activity: "Travel Game"</p> <p>Balance and Motion Investigation 2, Parts 1-3, pp. 8-25 (spinners) Balance and Motion <u>FOSS Science Stories</u> pp. 10-13 (push or pull) Human Body Investigation 3, Parts 1-3, pp. 8-21 (working leg, thumb models) Water Investigation 4, Part 2, pp. 14-18 (waterwheels)</p> <p>Physics of Sound Investigation 1, Part 3, pp. 21-29 (sound and vibrations) Matter and Energy Investigation 1, Part 1, 3, pp. 50-62, 71-82 (energy)</p> <p>Physics of Sound Investigation 2, Part 1, pp. 8-12 (vibration and pitch) Investigation 2, Part 2, pp. 13-19 (length and pitch) Investigation 2, Part 3, pp. 20-24 (tension and pitch)</p> <p>Ideas and Inventions Investigation 4, Parts 1-2, pp. 8-17 (reflecting) Ideas and Inventions <u>FOSS Science Stories</u> pp. 23-27 Matter and Energy Investigation 2, Part 1, pp. 93-102 (reflected light) Matter and Energy <u>FOSS Science Resources</u> pp.24-28, 33</p> <p>Magnetism and Electricity <u>FOSS Science Stories</u> p.15</p> <p>Water Investigation 2, Part 2, pp. 14-19 (sinking/floating water) Measurement Investigation 4, Part 1, pp. 8-13 (measuring temp.)</p>
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<p>Use electricity to produce heat, sound, and magnetic effects.</p> <p>Demonstrate electrical circuits require a complete loop through which an electrical current can pass.</p> <p>Describe the physical properties of magnets.</p> <p>4.4 Life Science</p> <p>Life science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p> <p>4.4.1 By the end of fourth grade, students will develop an understanding of the characteristics of living things.</p> <p>Student demonstrations:</p> <p>Describe the differences between plants and animals.</p> <p>Describe the various structures of plants and animals necessary for growth, survival, and reproduction.</p>	<p>Magnetism and Electricity Investigation 2, Parts 1-3, pp. 8-25 (circuits) Investigation 4, Part 1, pp. 8-13 (electromagnets) Investigation 5, Parts 1-2, pp. 8-20 (telegraphs) FOSS Web Movie: How a Speaker Works Matter and Energy Investigation 1, Parts 1, 3, pp. 50-62, 71-82 (energy)</p> <p>Magnetism and Electricity Investigation 2, Parts 1-2, pp. 8-19 (circuits) Investigation 3, Parts 1-2, pp. 10-21 (series/parallel) Matter and Energy Investigation 1, Parts 1, 3, pp. 50-62, 71-82 (energy)</p> <p>Magnetism and Electricity Investigation 1, Parts 1-4, pp.8-34 (the force) Magnetism and Electricity FOSS Science Stories pp. 1-6 FOSS Web Activity: Electromagnets</p> <p>New Plants Investigation 1, Parts 1-3, pp. 8-30 (fast plants) Investigation 3, Parts 1-3, pp. 8-25 (new plants from cuttings) New Plants FOSS Science Stories pp. 3-24 Plants and Animals Investigation 1-4, all parts Plants and Animals FOSS Science Resources pp. 3-50 Insects and Plants Investigation 1-5, all parts Insects and Plants FOSS Science Resources pp. 3-55 Structures of Life ALL Investigations 1-4 (plants, crayfish, snails) Structures of Life FOSS Science Stories pp. 3-30</p> <p>Insects ALL, such as Investigation 5, Parts 1-3, pp. 10-24 (painted ladies) New Plants</p>
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<p>Describe internal causes of behavior, such as hunger, and external causes of behavior, such as change in the environment, in living things.</p> <p>4.4.2 By the end of fourth grade, students will develop an understanding of the life cycles of living things.</p> <p>Student demonstrations:</p> <p>Describe the life cycle of an organism.</p>	<p>Investigation 3 and 4 (plant structures) Plants and Animals Investigation 1, Parts 1-3, pp. 47-72 (grass and grain seeds) Investigation 2, Parts 1-3, pp. 87-108 (stems) Investigation 3, Part 3, pp. 135-140 (habitat match) Investigation 4, Parts 1-2, pp. 151-163 (roots) Plants and Animals FOSS Science Resources pp. 4-7, 16-19, 28-30, 35, 44-45, 47-50 Insects and Plants Investigation 1-5, all parts Insects and Plants FOSS Science Resources pp. 15-19, 30-33 Structures of Life ALL, such as Investigation 2, Parts 1-3, pp. 8-22 (bean structures) Investigation 4, Part 2, pp. 14-19 (snail structures) Structures of Life FOSS Science Stories pp. 17-23</p> <p>New Plants Investigation 3, Parts 1-3, pp. 8-25 (rooting from cuttings) Insects Investigation 6, Part 2, pp.14-17 (ants) Plants and Animals Investigation 1, Part 2, pp. 58-62 (mowing the lawn) Plants and Animals FOSS Science Resources pp. 22-24, 29, 32, 40, 44-45 Insects and Plants FOSS Science Resources pp. 11-13, 37-55 Structures of Life Investigation 3, Parts 3-4, pp. 20-30 (crayfish) Structures of Life FOSS Science Stories pp. 22-24</p> <p>New Plants Investigation 1, Parts 2-3, pp. 13-30 (fast plant life cycle) Insects ALL, such as Investigation I, Parts 1-3, pp. 8-25 (mealworms) Insects and Plants Investigation 1-5, all parts Insects and Plants FOSS Science Resources pp. 37-55 Structures of Life Investigation 2, Part 3, pp. 18-22 (bean life</p>
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<p>Recognize inherited characteristics of living things, such as color and number of eyes.</p> <p>Recognize learned characteristics of living things, such as language or hunting for food.</p> <p>4.4.3 By the end of fourth grade, students will develop an understanding of living things and environments.</p> <p>Student demonstrations:</p> <p>Diagram a food chain.</p> <p>Explain how environmental changes affect behavior and survival of living things.</p> <p>Describe how humans and other living things cause positive and negative changes in their environment.</p> <p>4.5 Earth and Space Science</p> <p>Earth and space science focuses on the science facts, concepts, principles, theories, and models that are important for all students</p>	<p>cycle) <u>Structures of Life</u> FOSS Science Stories pp. 20-21 FOSS Web Activity: Life Cycles</p> <p>Insects Investigation 4, Parts 3-5, pp. 19-35 (silkworms)</p> <p>New Plants Investigation 3, Parts 1-3, pp. 8-25 (new plants from cuttings)</p> <p>Plants and Animals Investigation 2, Parts 1-3, pp. 87-108 (stems)</p> <p>Insects and Plants Investigation 3, Parts 1-3, pp. 129-151 (milkweed bugs)</p> <p><u>Insects and Plants</u> FOSS Science Resources pp. 20-24</p> <p>Structures of Life Investigation 2, Part 3, pp. 18-22 (beans)</p> <p><u>Structures of Life</u> FOSS Science Stories p. 28</p> <p>Human Body Investigation 1, Part 3, pp. 21-25 (owl pellets)</p> <p>New Plants Investigation 2, Parts 1-3, pp. 8-28 (mowing lawns)</p> <p>Plants and Animals Investigation 1, Parts 1-2, pp. 47-62 (mowing lawns)</p> <p>Structures of Life Investigation 3, Parts 3-4, pp. 20-30 (crayfish territory)</p> <p><u>Structures of Life</u> FOSS Science Stories pp. 12-16</p> <p><u>Pebbles, Sand and Silt</u> FOSS Science Stories pp. 14-17</p> <p><u>Structures of Life</u> FOSS Science Stories pp. 10-11</p> <p><u>Water</u> FOSS Science Stories pp. 20, 23</p> <p><u>Earth Materials</u> FOSS Science Stories pp. 24-29</p>
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<p>to know, understand, and use.</p> <p>4.5.1 By the end of fourth grade, students will develop an understanding of the characteristics of earth materials.</p> <p>Student demonstrations:</p> <p>Identify characteristics of soils, rocks, water, and the atmosphere.</p> <p>List earth materials that are used by humans.</p> <p>Select the best earth material for a specific human use.</p> <p>Describe an ancient environment based on fossil evidence.</p> <p>4.5.2 By the end of fourth grade, students will develop an understanding of objects in the sky.</p> <p>Student demonstration:</p> <p>Describe and observe how objects move in patterns, such as sun, moon, stars, and</p>	<p>Pebbles, Sand, and Silt Investigation 1, Parts 1-3, pp. 8-21 (rocks) Investigation 4, Parts 1-3, pp. 8-25 (soils) <u>Pebbles, Sand and Silt</u> FOSS Science Stories pp. 3-13,18-24</p> <p>Air and Weather Investigation 2, Parts 1-4, pp. 8-27 observing weather <u>Air and Weather</u> FOSS Science Stories pp. 7-17</p> <p>Earth Materials ALL, such as Investigation 2, Parts 1-2, pp. 8-21 (minerals) <u>Earth Materials</u> FOSS Science Stories pp. 1-11 FOSS Web Activity: Rock Database</p> <p>Water Investigation 1, Parts 1-3, pp. 8-23 (water properties) <u>Water</u> FOSS Science Stories pp. 1-16</p> <p>Pebbles, Sand, and Silt Investigation 3, Parts 1-5, pp. 8-29 (using rocks) <u>Earth Materials</u> FOSS Science Stories pp. 8-15, 24-29 <u>Water</u> FOSS Science Stories pp. 1-3,10-11,17-29</p> <p>Pebbles, Sand, and Silt Investigation 3, Parts 1-5, pp. 8-29 <u>Pebbles, Sand and Silt</u> FOSS Science Stories pp. 14-17,22-23 <u>Earth Materials</u> FOSS Science Stories pp. 12-13, 24-29 <u>Water</u> FOSS Science Stories pp. 1-3,10-11,17-29</p> <p><u>Earth Materials</u> FOSS Science Stories p. 4 <u>Human Body</u> Science Stories pp. 21-24</p> <p>Air and Weather Investigation 2, Part 3, pp. 20-23 (sun)</p>
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<p>clouds.</p> <p>4.5.3 By the end of fourth grade, students will develop an understanding of the changes in the earth and sky.</p> <p>Student demonstrations:</p> <p>Describe how slow processes, such as erosion, and rapid processes, such as earthquakes, change the earth's surface.</p> <p>Describe changes in weather using measurable quantities, such as temperature, precipitation, and wind direction and speed.</p> <p>4.6 Science and Technology</p> <p>An understanding of science and technology establishes connections between the natural and designed world, by linking science with technology.</p> <p>4.6.1 By the end of fourth grade, students will develop an understanding of technological design.</p> <p>Student demonstrations:</p> <p>Identify a simple problem.</p> <p>Propose a solution to a simple problem.</p> <p>Implement the proposed solution.</p> <p>Evaluate the implementation.</p> <p>Communicate the problem, design, and</p>	<p>Investigation 4, Part 3, pp. 19-24 (night sky) Sun, Moon and Stars Investigation 1, Parts 1-2, pp. 42-64 (sun) Investigation 2, Parts 1-2, pp. 79-100 (moon) Investigation 3, Part 1, pp. 114-130 (star patterns) Sun, Moon and Stars FOSS Science Resources pp. 3-38</p> <p>Earth Materials FOSS Science Stories pp. 5-7 Water FOSS Science Stories pp. 22-23</p> <p>Air and Weather Investigation 2, Parts 1-4, pp. 8-27 Investigation 4, Part 1, pp. 8-11 Air and Weather FOSS Science Stories pp. 7-15</p> <p>Ideas and Inventions Investigation 3, Part 3, pp. 18-21 (mystery pens) Ideas and Inventions FOSS Science Stories pp. 1-3,10,17-18,21-22,28-29 Water Investigation 4, Part 2, pp. 14-18 (waterwheel design)</p> <p>Ideas and Inventions Investigation 3, Part 3, pp. 18-21 Water Investigation 4, Part 2, pp. 14-18</p> <p>Ideas and Inventions Investigation 3, Part 3, pp. 18-21 Water Investigation 4, Part 2, pp. 14-18</p> <p>Ideas and Inventions Investigation 3, Part 3, pp. 18-21 Water Investigation 4, Part 2, pp. 14-18</p> <p>Ideas and Inventions</p>
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<p>solution.</p> <p>4.6.2 By the end of fourth grade, students will develop an understanding of science and technology.</p> <p>Student demonstrations:</p> <p>Recognize science as one way of answering questions and explaining the natural world.</p> <p>Recognize that technology, such as tools and techniques, uses scientific knowledge to solve problems.</p> <p>4.6.3 By the end of fourth grade, students will develop an understanding of the abilities to distinguish between natural objects and objects made by humans.</p> <p>Student demonstration:</p> <p>Classify an object as either natural or manufactured.</p> <p>4.7 Science in Personal and Social Perspectives</p> <p>A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.</p> <p>4.7.1 By the end of fourth grade, students will develop an understanding of personal health.</p>	<p>Investigation 3, Part 3, pp. 18-21 Water Investigation 4, Part 2, pp. 14-18</p> <p>Plants and Animals Investigation 2, Parts 1-3, pp. 87-108 (stems) Ideas and Inventions Investigation 3, Part 1, pp. 8-13 (chromatography) Magnetism and Electricity FOSS Science Stories pp. 17-19, 20-23 Sun, Moon and Stars Investigation 1, Part 2, pp. 56-64 (sun tracking) Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)</p> <p>Measurement Investigation 2, Parts 1-2, pp. 8-17 Ideas and Inventions FOSS Science Stories pp. 1-3, 11-14, 19-20, 22 Magnetism and Electricity ALL, such as Investigation 4, Parts 1-3, pp. 8-22 (electromagnets) Magnetism and Electricity FOSS Science Stories pp. 17-19, 20-23 FOSS Web Movie: "How a Light Bulb Works" Matter and Energy Investigation 3, Part 2, pp. 139-150 (weighty matter)</p> <p>Plants and Animals FOSS Science Resources pp. 9-13 Earth Materials FOSS Science Stories pp. 1-7, 14-15, 24-29 Human Body FOSS Science Stories p. 18-20, 22-24</p>
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Student demonstrations:

Explain how the body uses food and how various foods contribute to health.

Describe how different substances, such as tobacco, alcohol, and drugs, can damage the body and alter how it functions.

4.7.2 By the end of fourth grade, students will develop an understanding of the types of resources.

Student demonstrations:

List examples of resources which are basic materials, such as air, water, and soil.

List examples of resources produced from basic materials, such as food, fuel, and building materials.

List examples of resources which are intangible materials, such as beauty, security, and quiet places.

Research and report on the supply of various resources.

4.7.3 By the end of fourth grade, students will develop an understanding of

Human Body FOSS Science Stories
pp. 25-29

Air and Weather ALL, such as Investigation 1, Parts 1-6, pp. 8-38 (air)
Pebbles, Sand, and Silt Investigation 4, Parts 1-2, pp. 8-19 (soil)
Pebbles, Sand, and Silt FOSS Science Stories pp.18-23
Earth Materials Investigation 2, Parts 1-2, pp. 8-21 (minerals)
Earth Materials FOSS Science Stories pp. 12-13, 24-29
Matter and Energy FOSS Science Resources pp. 1-5, 9-10

Pebbles, Sand, and Silt Investigation 3, Part 5, pp. 24-29 (bricks)
Plants and Animals FOSS Science Resources pp. 9-13
Earth Materials FOSS Science Stories pp. 24-27
Water FOSS Science Stories pp. 17-26
Water FOSS Web Activity: "Match the Resource"
Matter and Energy FOSS Science Resources pp. 1-5, 9-11

Earth Materials FOSS Science Stories pp. 5-7,14-15,16-29 (special and/or sacred places)
Physics of Sound FOSS Science Stories pp. 11-13 (music)

Water Investigation 4, Part 4, pp. 16-20 (Projects)
Water FOSS Science Stories pp. 8-9
Measurement Home/School Connections
Measurement FOSS Science Stories pp. 16-17
Earth Materials Investigation 4, Part 2, pp. 14-18 (Projects)

<p>environmental changes.</p> <p>Student demonstration:</p> <p>Distinguish between natural environmental changes and human influenced environmental changes.</p> <p>4.7.4 By the end of fourth grade, students will develop an understanding of how science and technology helps communities resolve problems.</p> <p>Student demonstration:</p> <p>Research and explain how science and technology affect the quality of life.</p> <p>4.8 History and Nature of Science</p> <p>The history and nature of science illustrates different aspects of scientific inquiry, the human aspects of science, and the role of science in the development of various cultures.</p> <p>4.8.1 By the end of fourth grade, students will develop an understanding of science as a human endeavor.</p> <p>Student demonstrations:</p> <p>Research and report on the contributions to science and technology throughout history by men and women scientists of diverse cultures.</p>	<p>New Plants Investigation 2, Part 2, pp. 15-19 (mowing lawns)</p> <p>Plants and Animals Investigation 1, Part 2, pp. 58-62 (mowing lawns)</p> <p>Plants and Animals FOSS Science Resources pp. 1-13</p> <p>Pebbles, Sand and Silt FOSS Science Stories pp. 12-17</p> <p>Water FOSS Science Stories pp. 18-23</p> <p>Magnetism and Electricity FOSS Science Stories pp. 10-16,24-25</p> <p>Ideas and Inventions FOSS Science Stories pp. 1-3,10,17-18,21-22,28-29</p> <p>Physics of Sound FOSS Science Stories pp. 11-13,22-24,25-29</p> <p>Human Body FOSS Science Stories pp. 5-7,17-20,25-27 Human Body FOSS Web Movie: MRI Section</p> <p>Matter and Energy FOSS Science Resources pp. 2-3, 6-7, 9-13</p> <p>FOSS Web Site: www.fossweb.com “Careers” section (for each module)</p> <p>Ideas and Inventions FOSS Science Stories pp. 17-23</p> <p>Measurement FOSS Science Stories pp. 11-12, 21</p> <p>Human Body FOSS Science Stories pp.21-24</p> <p>Sun, Moon and Stars FOSS Science</p>
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Nebraska Science Standards

Grades 5-8

At the middle school level, students expand their scientific inquiry skills through knowledge, observations, ideas, and questions. Middle school students will begin to recognize the relationships between explanation and evidence. They understand that background knowledge and theories guide the design of investigations, the types of observations made, and the interpretation of data. Student investigations will shape and modify students' background knowledge.

FOSS modules are inquiry-based. The fundamentals of scientific inquiry are imbedded in all FOSS modules at a developmentally appropriate level. The following correlation of the Nebraska Science Standards to the Full Option Science System (FOSS) is to show representative examples of investigations from FOSS that address the content standards. A citation does not reflect all of the investigations or activities from FOSS that might address a particular standard. FOSS modules are inquiry-based.

NOTE: Examples for each of the Grades 5-8 standards are listed from the elementary FOSS modules for grades 5-6, and from the FOSS Middle School Courses, designed for grades 6-8. The FOSS Middle School courses are Human Brain and Senses, Earth History, Planetary Science, Weather and Water, Populations and Ecosystems, Diversity of Life, Force and Motion, Chemical Interactions and Electronics. Modules will be listed in order of cognitive complexity (5-6 modules before 6-8 modules) unless the 6-8 modules are a more precise fit with the standard.

STANDARD	FOSS
<p>8.1 Unifying Concepts and Processes</p> <p>Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.</p> <p>8.1.1 By the end of eighth grade, students will develop an understanding of systems, order, and organization.</p> <p>Student demonstrations:</p> <p>Recognize and describe integral parts and functions of any system.</p>	<p>ALL FOSS modules help students develop deep understanding of the unifying concepts and processes, at a developmentally appropriate level.</p> <p>Models and Designs Investigation 4, Parts 1-2, pp. 6-15 (go-carts)</p> <p>Variables Investigation 4, Parts 1-2, pp. 8-17 (catapults)</p> <p>Living Systems Investigation 1, Parts 1-3, pp. 51-70 (human systems)</p> <p>Water Planet Investigation 4, Part 1, pp. 50-58 (solar system)</p> <p>Levers and Pulleys Investigation 1, Part 1, pp. 8-17 (lever systems)</p> <p>Electronics Investigation 1, Parts 1-2, pp. 55-65 (circuits)</p>

<p>Analyze and predict the interactions within a system and between systems.</p>	<p>Populations and Ecosystems ALL, such as Investigation 3, Parts 1-3, pp. 90-107 <u>Populations and Ecosystems Resources</u> pp. 6-13,17-21 Force and Motion Investigation 5, Part 2, pp. 177-186 (mechanical dot car) Chemical Interactions Investigation 3, Parts 1-3, pp. 92-113</p>
<p>Interpret cause and effect relationships within and between systems.</p>	<p>Models and Designs Investigation 4, Parts 1-2, pp. 8-15 Variables Investigation 4, Parts 1-2, pp. 8-17 <u>Variables FOSS Science Stories</u> pp. 15-28 Levers and Pulleys Investigation 1, Part 1, pp. 8-17 Living Systems Investigation 1, Parts 1-3, pp. 51-70 (human systems) Water Planet Investigation 4, Part 1, pp. 50-58 (solar system) Electronics Investigation 1, Parts 1-2, pp. 55-65 Populations and Ecosystems ALL, such as Investigation 4, Parts 1-2, pp. 119-129 (model ecosystem) <u>Populations and Ecosystems Resources</u> pp. 22-41 <u>Populations and Ecosystems CD-ROM</u> Force and Motion Investigation 1, Parts 1-3, pp. 47-66 Chemical Interactions Investigation 5, Parts 1-3, pp. 153-171</p>
<p>Create and use classification schemes.</p>	<p>Food and Nutrition Investigations 1-3 (fats, sugars, citric acid) Living Systems Investigation 2, Part 2, pp. 99-106 (leaf classification) <u>Living Systems FOSS Science Resources</u> pp. 21-22 Diversity of Life Investigation 10 (kingdoms of life) <u>Diversity of Life Resources</u> pp. 16-17, 21-30 <u>Diversity of Life CD-ROM</u> Planetary Science Investigation 8 (moon rocks) <u>Planetary Science Resources</u> pp. 41-42 Chemical Interactions Investigation 2, Part 1, pp. 75-80</p> <p>Mixtures and Solutions Investigation 4, Parts 2-3, pp. 16-24 (reactions) Landforms Investigation 3, Parts 1-2, pp. 8-19 (stream</p>

<p>8.1.2 By the end of eighth grade, students will develop an understanding of evidence, models, and explanation.</p> <p>Student demonstrations:</p> <p>Collect, manipulate, and analyze data from an experiment.</p> <p>Observe and develop models, such as physical, mathematical, mental, and computer simulations.</p>	<p>table)</p> <p>Environments Investigation 4, Part 2, pp. 13-18 (fish/plant/indicator)</p> <p>Living Systems Investigation 1, Parts 1-3, pp. 51-70 (human systems)</p> <p>Water Planet Investigation 4, Part 1, pp. 50-58 (solar system)</p> <p>Weather and Water Investigation 5, Parts 1-3, pp. 152-174 (convection)</p> <p>Populations and Ecosystems ALL, such as Investigation 7 (Ecoscenarios)</p> <p><u>Populations and Ecosystems Resources</u> pp. 22-41</p> <p><u>Populations and Ecosystems CD-ROM</u></p> <p>Force and Motion Investigation 1, Parts 1-3, pp. 47-66</p> <p>Chemical Interactions Investigation 5, Parts 1-3, pp. 153-171</p> <p>This standard is addressed in ALL FOSS modules. See for example:</p> <p>Variables, ALL, such as Investigation 1, Parts 1-2, pp. 8-22 (pendulums)</p> <p>Food and Nutrition ALL, such as Investigation 2, Part 2, pp. 18-21 (sugar test)</p> <p>Living Systems Investigation 2, Part 1, pp. 85-98 (celery)</p> <p>Water Planet Investigation 3, Part 1, pp. 125-125 (earth materials)</p> <p>Human Brain and Senses Investigation 7, Parts 1 and 2 (touch)</p> <p>Earth History Investigation 5, Part 2, pp. 179-182 (limestone)</p> <p>Force and Motion Investigation 3, Part 1, pp. 111-118</p> <p>Chemical Interactions Investigation 4, Parts 1-3, pp. 122-141</p> <p>Landforms Investigation 4, Part 1, pp. 8-15 (topographic maps)</p> <p>Environments Investigation 1, Parts 1-2, pp. 8-19 (mini-gardens)</p> <p>FOSS Web Site simulations for ALL modules:</p>
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8.1.3 By the end of eighth grade, students will develop an understanding of change, constancy, and measurement.

Student demonstrations:

Select and use appropriate measurement units.

Quantify changes in systems.

Investigation 3, Part 1, pp. 125-135 (earth materials)

Diversity of Life

Investigation 6 (Transpiration)

Earth History

Investigation 8, Part 2, pp. 259-265 (salol crystals)

Electronics Investigation 3 (voltage)

Force and Motion

Investigation 8, Parts 1-2, pp. 284-301

Levers and Pulleys

Investigation 3, Parts 1-2, pp. 8-20 (pulleys/length)

Mixtures and Solutions

Investigation 2, Parts 1-4, pp. 8-28 (mass and volume)

Weather and Water

Investigation 5, Parts 1-3, pp. 152-174 (density)

Solar Energy

Investigation 2, Parts 1-2, pp. 8-24 (temp. change)

Living Systems

Investigation 2, Part 1, pp. 85-98 (celery)

Water Planet

Investigation 3, Part 1, pp. 125-135 (earth materials)

Electronics

Investigation 3, Parts 1-4, pp. 119-132 (voltage)

Human Brain and Senses

Investigation 7, Part 2, pp. 219-225 (distance)

Chemical Interactions

Investigation 10, Parts 1-2, pp. 323-336

Force and Motion

Investigation 1, Parts 1-2, pp. 47-62

Mixtures and Solutions

Investigation 2, Part 2, pp. 16-20 (mass change)

Variables

Investigation 2, Part 2, pp. 14-18 (volume/capacity)

Solar Energy

Investigation 3, Parts 1-3, pp. 8-23

Living Systems

Investigation 2, Part 1, pp. 85-98 (celery)

Water Planet

Investigation 3, Part 1, pp. 125-135 (earth materials)

Electronics

<p>Use English and metric systems of measurements.</p>	<p>Investigation 2, Part 1, pp. 89-93 (resistance) Weather and Water Investigation 4, Parts 1-2, pp. 121-139 (heat transfer) Chemical Interactions Investigation 7, Parts 1-5, pp. 204-234 Force and Motion Investigation 5, Parts 1-4, pp. 169-201</p>
<p>Investigate and describe changes in terms of scale, rate, and pattern.</p>	<p>Models and Designs FOSS Science Stories pp. 18, 25, 31 Levers and Pulleys Investigation 1, Part 3, pp. 24-28 (distance vs. force in N) Food and Nutrition Investigation 2 (volume of gas) Landforms, Investigations 4-5 (feet elevation) Living Systems Investigation 2, Part 1, pp. 85-98 (celery) Water Planet Investigation 3, Part 1, pp. 125-135 (earth materials) Planetary Science Investigation 7, Part 2, pp. 222-229 (distance to the moon) <u>Planetary Science Resources</u> p. 35 Weather and Water Investigation 2 and 3 (atmospheric heights) Chemical Interactions Investigation 7, Parts 1-5, pp. 204-234</p> <p>Landforms Investigation 2, Parts 1-2, pp. 8-22 (stream tables) Solar Energy Investigation 1, Part 2, pp. 14-21 (shadow changes) Water Planet Investigation 3, Parts 1-2, pp. 125-144 (heating earth) Planetary Science Investigation 9, Parts 1-4, pp. 283-301 (moon phases) <u>Planetary Science Resources</u> pp. 32,36-39,52-55,69-70,83-89 <u>Planetary Science CD-ROM</u> Weather and Water Investigation 7, Parts 1-2, pp. 232-243 (water cycle) <u>Weather and Water Resources</u> pp. 12-36, 63-66 <u>Weather and Water CD-ROM</u> Populations and Ecosystems Investigations 1 and 6 (milkweed bug population change) Force and Motion Investigation 5, Parts 1-4, pp. 169-201 Chemical Interactions</p>

8.1.4 By the end of eighth grade, students will develop an understanding of form and function.

Student demonstration:

Demonstrate how the design of an object makes it possible for that object to perform a specialized task, such as a bicycle or airplane.

8.2 Science as Inquiry

Science as inquiry requires students to combine processes and scientific knowledge with scientific reasoning and critical thinking to develop their understanding of science.

8.2.1 By the end of eighth grade, students will develop the abilities needed to do scientific inquiry.

Student demonstrations:

Identify questions and form hypotheses that can be examined through scientific investigations.

Investigation 4, Parts 1-3, p. 122-141

Models and Designs

Investigation 3, Part 2, pp. 13-19 (go-carts)

Models and Designs FOSS Science Stories pp. 21-40

Levers and Pulleys

Investigation 2, Parts 3-4, pp. 18-25 (real-world levers)

Levers and Pulleys FOSS Science Stories pp. 1-32

Variables

Investigation 3, Parts 2-3, pp. 14-23 (airplanes)

Variables FOSS Science Stories pp. 15-31

Human Brain and Senses

Investigation 3, Parts 1-3, pp. 92-110 (lenses)

Human Brain and Senses Resources pp. 31-38

Diversity of Life

Investigation 2, Parts 1-3, pp. 72-91 (microscope)

Force and Motion

Investigation 5, Parts 1-4, pp. 169-201

Force and Motion Resources Pages 41-44

Note: this standard is the focus of the “Scientific Reasoning Strand” modules for Grades 5-6, **Variables**, and **Models and Designs**, and is embedded throughout the FOSS Middle School modules. See for example:

Variables, ALL, such as

Investigation 4, Parts 1-4, pp. 8-28 (catapults)

Mixtures and Solutions

Investigation 4, Part 4, pp. 25-28 (projects)

Living Systems

Investigation 2, Part 1, pp. 85-98 (celery)

Water Planet

Investigation 3, Part 1, pp. 125-135 (earth materials)

<p>Design and conduct a scientific investigation.</p>	<p>Earth History Investigation 2, Parts 3-4, pp. 68-74 (Grand Canyon questions)</p> <p>Planetary Science Investigation 4, Parts 1-4, pp. 120-140 (moon questions)</p> <p>Chemical Interactions Investigation 1, Parts 1-2, pp. 41-58</p>
<p>Use appropriate tools and techniques to gather, analyze, and interpret data.</p>	<p>This standard is addressed in ALL FOSS modules for Grades 5-8. See for example:</p> <p>Solar Energy Investigation 4, Parts 1-4, pp. 8-33 (solar houses and projects)</p> <p>Variables Investigation 4, Part 4, pp. 24-28 (projects)</p> <p>Living Systems Investigation 3, Part 3, pp. 136-141 (cereal testing)</p> <p>Water Planet Investigation 2, Parts 2-3, pp. 136-157 (water vapor)</p> <p>Diversity of Life Investigation 8, Parts 1-3, pp. 239-259 (snail investigations)</p> <p>Earth History Investigation 4, Parts 2-3, pp. 132-146 (sand samples and stream tables)</p> <p>Force and Motion Investigation 1, Parts 1-2, pp. 47-62</p>
<p>Develop descriptions, explanations, predictions, and models using evidence.</p>	<p>Mixtures and Solutions Investigation 2, Parts 1-3, pp. 8-25 (making and weighing solutions)</p> <p>Solar Energy Investigation 3, Parts 1-2, pp. 8-23 (temp. change related to color)</p> <p>Living Systems Investigation 2, Part 1, pp. 85-98 (celery)</p> <p>Water Planet Investigation 3, Part 1, pp. 125-135 (earth materials)</p> <p>Planetary Science Investigation 3, Part 2, pp. 94-98 (day and night)</p> <p>Electronics Investigation 8, Parts 1-4, pp. 250-271 (current)</p> <p>Chemical Interactions Investigation 4, Parts 1-3, pp. 122-141</p> <p>Landforms Investigation 2, Parts 1-2, pp. 8-22 (stream tables)</p> <p>Food and Nutrition Investigation 1, Parts 1-2, pp. 8-20 (fat calculations)</p> <p>Living Systems</p>

<p>8.3 Physical Science</p> <p>Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p> <p>8.3.1 By the end of eighth grade, students will develop an understanding of properties and changes of properties in matter.</p> <p>Student demonstrations:</p> <p>Investigate and demonstrate that characteristic properties, such as density, boiling point, and solubility of substances, are not dependent on the quantity of the substance.</p> <p>Observe, describe, and measure physical and chemical properties of matter.</p>	<p>(convection/density) Weather and Water Resources pp.12-36 Weather and Water CD-ROM Populations and Ecosystems Investigation 6, Parts 1-3, pp. 179-197 (population size) Planetary Science Investigation 7, Parts 1-5, pp. 218-237 (Moon travel calculations) Planetary Science Resources pp. 35-38 Chemical Interactions Investigation 6 Force and Motion ALL, such as Investigation 6, Parts 1-4, pp. 218-251 Electronics Investigation 2, Parts 1-3, pp. 89-103</p> <p>Mixtures and Solutions Investigation 2, Parts 1-4, pp. 8-28 (solubility) Food and Nutrition Investigation 3, Parts 1-3 (acid test) Weather and Water Investigation 5, Parts 1-3, pp. 152-174 (density) Earth History Investigation 5, Part 2, pp. 179-182 (limestone properties) Planetary Science Investigation 8, Parts 1-4, pp. 250-270 (rock density) Chemical Interactions throughout, such as Investigation 8, Parts 1-3, pp. 248-268 Investigation 6, Part 1, pp. 178-187 Chemical Interactions Resources Pages 42-62 Chemical Interactions CD-ROM</p> <p>Mixtures and Solutions Investigation 3, Part 2, pp. 15-20 (concentration) Investigation 4, Parts 1-3, pp. 8-24 (reactions) Mixtures and Solutions FOSS Science Stories pp. 1-10,16-17,18-22,26-30 Food and Nutrition Investigation 1, Parts 1-2, pp. 8-20 (fat test)</p>
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Relate that all matter is composed of elements which may combine in a variety of ways to form compounds.

Investigate and relate that in chemical reactions, total mass is conserved.

8.3.2 By the end of eighth grade, students will develop an understanding of motion and forces.

Student demonstrations:

Investigate, describe, and represent the motion of an object by its position, direction of motion, and speed.

Living Systems

Investigation 3, Part 3, pp. 136-141 (cereal testing)

Water Planet

Investigation 3, Part 1, pp. 125-135 (earth material)

Chemical Interactions throughout, such as Investigation 4, Parts 1-3, pp. 122-141 Investigation 9, Parts 1-4, pp. 280-312

Chemical Interactions Resources

pp. 16-62

Chemical Interactions CD-ROM

Weather and Water

Investigation 2 (properties of air)

Planetary Science

Investigation 8, Parts 1-4, pp. 250-270 (rock density)

Planetary Science CD-ROM

Earth History Investigation 5, Parts 1-4, pp. 175-193

Earth History Resources pp. 68-75,87-90

Mixtures and Solutions

Investigation 4, Part 3, pp. 20-24

Mixtures and Solutions FOSS Science Stories pp. 21-22

Chemical Interactions throughout, such as Investigation 2, Parts 1-2, pp. 70-80 Investigation 9, Parts 1-4, pp. 280-312

Chemical Interactions Resources

pp. 3-15, 63-96

Chemical Interactions CD-ROM

Chemical Interactions

Investigation 9, Parts 1-4, pp. 280-312

Investigation 10, Parts 1-2, p. 323-336

Chemical Interactions CD-ROM

Mixtures and Solutions FOSS Science Stories pp. 3-6, 21-30

FOSS Web Movie: Physical and Chemical Changes

Models and Designs

Investigation 3, Parts 1-3, pp. 8-23 (go-carts)

Variables

Investigation 1, Parts 1-3, pp. 8-27 (pendulums)

Levers and Pulleys

Investigation 2, Parts 1-4, pp. 8-25 (lever loads/forces)

Levers and Pulleys FOSS Science Stories

pp. 1-34

Force and Motion throughout, such as

Investigate and demonstrate that the speed and/or direction of an object changes when a force is applied to that object.

8.3.3 By the end of eighth grade, students will develop an understanding of the transfer of energy.

Student demonstrations:

Investigate, explain, and give examples of the forms of energy, such as heat, light, chemical, sound, electrical, and how energy is transferred.

Investigate and describe energy transfer using simple machines.

Investigate and describe how heat is transferred from a warmer object to a cooler

Investigation 1, Parts 1-3, pp. 47-66
Investigation 2, Parts 1-3, pp. 78-99
Force and Motion Resources Pages 1-31
Force and Motion CD-ROM

Models and Designs

Investigation 4, Parts 1-2, pp. 6-15 (go-cart tricks)

Levers and Pulleys

Investigation 1, Parts 1-3, pp. 8-28 (lever experiments)

Variables

Investigation 3, Parts 1-2, pp. 8-19 (planes)

Force and Motion throughout, such as

Investigation 5, Parts 1-4, pp. 169-201

Investigation 6, Parts 1-4, pp. 218-251

Force and Motion Resources Pages 50-74

Force and Motion CD-ROM

Solar Energy

Investigation 2, Parts 1-2, pp. 8-24 (heat transfer)

Models and Designs

Investigation 2, Parts 1-3, pp. 8-24 (humdingers)

Water Planet

Investigation 3, Part 1, pp. 125-135 (earth materials)

Water Planet FOSS Science Resources pp. 42-45

Electronics

Investigations 1-3 (various circuits)

Electronics Resources pp. 12-36

Electronics CD ROM

Force and Motion throughout, such as

Investigation 5, Parts 1-4, pp. 169-201

Investigation 8, Parts 1-2, pp. 284-301

Force and Motion CD-ROM

Chemical Interactions

Investigation 5, Parts 1-3, pp. 153-171 (energy transfer)

Chemical Interactions Resources

Pages 32-48

Chemical Interactions CD-ROM

Levers and Pulleys ALL, such as

Investigation 2, Parts 1-2, pp. 8-17

Investigation 4, Parts 1-2, pp. 8-20

Levers and Pulleys FOSS Science Stories pp. 5-8

Solar Energy

Investigation 4, Parts 1-2, pp. 8-23 (heat

<p>object until both reach the same temperature.</p> <p>Investigate and describe the properties of sound.</p> <p>Investigate and describe the basic principles of electricity and magnetism.</p> <p>8.4 Life Science</p> <p>Life science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</p> <p>8.4.1 By the end of eighth grade, students will develop an understanding of the structure and function in living systems.</p> <p>Student demonstrations:</p> <p>Investigate and describe the levels of organizations: cells, tissues, organs, organ systems, whole organisms, and ecosystems.</p>	<p>transfer)</p> <p>Weather and Water Investigation 4, Parts 1-2 (heat transfer) <u>Weather and Water Resources</u> pp. 22-26</p> <p>Chemical Interactions Investigation 5, Parts 1-3, pp. 153-171 (energy transfer) <u>Chemical Interactions Resources</u> Pages 32-48 Chemical Interactions CD-ROM</p> <p>Variables FOSS Web Movie: Sound Experiments</p> <p>Models and Designs Investigation 2, Parts 1-2, pp. 8-21 (humdingers) Note: this standard is addressed very thoroughly in <i>Physics of Sound</i>, a FOSS module designed for Grades 3-4)</p> <p>Models and Designs Investigation 2, Parts 1-3, pp. 8-21 (humdingers) Electronics throughout, such as Investigation 1, Parts 1-3, pp. 55-70 (circuits) <u>Electronics Resources</u> pp. 1-11 <u>Electronics CD-ROM</u></p> <p><u>Environments FOSS Science Stories</u> pp.18-19, 32-33</p> <p><u>Food and Nutrition FOSS Science Stories</u> pp. 6-9</p> <p>Living Systems Investigation 1, Parts 1-3, pp. 51-70 (human systems) <u>Living Systems FOSS Science Resources</u> pp. 2-20</p> <p>Human Brain and Senses Investigation 4, Parts 1-3, pp. 120-143 (retina) <u>Human Brain and Senses Resources</u> pp. 29-30,39-46,65-74</p> <p>Diversity of Life Investigation 4 (Ribbon of Life) <u>Diversity of Life Resources</u> pp. 9, 27-45,65-70 Diversity of Life CD-ROM</p>
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<p>Investigate and describe how all living things are composed of cells.</p> <p>Investigate and describe how cells sustain life through functions, such as growth and nutrition.</p> <p>Investigate and describe the specialized function performed by specialized cells, such as muscular and skeletal, in multi cellular organisms.</p> <p>Investigate and describe the internal human body systems.</p> <p>Investigate and explain how disease affects the structure and/or function of an organism.</p> <p>8.4.2 By the end of eighth grade, students will develop an understanding of reproduction and heredity.</p> <p>Student demonstrations:</p> <p>Investigate and describe how all organisms reproduce through sexual or asexual</p>	<p>Living Systems Investigation 1, Part 1, pp. 51-59 (living cells) <u>Living Systems FOSS Science Resources</u> pp. 1-3 Diversity of Life ALL, especially Investigations 3-5 <u>Diversity of Life Resources</u> 27-45,65-70 <u>Diversity of Life CD-ROM</u></p> <p>Diversity of Life Investigations 1, 3 <u>Diversity of Life Resources</u> pp. 21-30, 65-70 <u>Diversity of Life CD-ROM</u></p> <p><u>Food and Nutrition FOSS Science Stories</u> pp. 6-9, 20 Living Systems Investigation 1, Parts 1-3, pp. 51-70 (human systems) <u>Living Systems FOSS Science Resources</u> pp. 2-13 Human Brain and Senses Investigation 4, Part 2, pp. 129-135 (retina) CD: Video: Cow Eye Dissection Diversity of Life Investigation 4, Parts 1-2, pp. 133-141 (the cell) <u>Diversity of Life Resources</u> pp. 27-39, 65-70 <u>Diversity of Life CD-ROM</u></p> <p><u>Food and Nutrition FOSS Science Stories</u> pp. 6-9 Living Systems Investigation 1, Parts 1-3, pp. 51-70 (human systems) <u>Living Systems FOSS Science Resources</u> pp. 2-13 Human Brain and Senses Investigations 2-8 (nervous system and interactions with other systems) <u>Human Brain and Senses Resources</u> pp. 63-74</p> <p>Food and Nutrition Investigation 3, Interdisciplinary Extension <u>Food and Nutrition FOSS Science Stories</u> pp. 2, 16-19, 24-25, 34-36 <u>Diversity of Life Resources</u> pp. 65-70</p> <p>Environments Investigation 5, Parts 1-3, pp. 8-22 (brine</p>
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<p>reproduction.</p> <p>Investigate and relate that females produce eggs and males produce sperm in many species.</p> <p>Investigate and state that chromosomes contain genes which influence heredity.</p> <p>Investigate and describe the effects of inherited traits on an organism's characteristics.</p> <p>8.4.3 By the end of eighth grade, students will develop an understanding of regulation and behavior.</p> <p>Student demonstrations:</p> <p>Investigate and explain how all organisms obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.</p> <p>Investigate and relate how an organism senses change in its internal or external environment and attempts to respond to keep conditions within a required range.</p>	<p>shrimp) <u>Environments FOSS Science Stories</u> pp.43-44 Diversity of Life Investigation 7, Parts 1-2, pp. 218-229 (plant reproduction) Investigation 8, Parts 1-3, pp. 239-259 (snails) <u>Diversity of Life Resources</u> pp. 26,40-45,53-54,58-64 Populations and Ecosystems Investigation 9, Parts 1-4, pp. 262-291 <u>Populations and Ecosystems Resources</u> pp. 46-57 <u>Populations and Ecosystems CD-ROM</u></p> <p>Environments Investigation 5, Part 1, pp. 8-13 (brine shrimp) Diversity of Life Investigation 7, Parts 1-2, pp. 218-229 (plant reproduction) Investigation 8, Parts 1-3, pp. 239-259 (snails) <u>Diversity of Life Resources</u> pp. 26,40-45,53-54,58-64 Populations and Ecosystems Investigation 9, Parts 1-4, pp. 262-291 <u>Populations and Ecosystems Resources</u> pp. 46-57 <u>Populations and Ecosystems CD-ROM</u></p> <p>Populations and Ecosystems Investigation 9, Parts 1-4, pp. 262-291 Investigation 10, Parts 1-3, pp. 302-317 <u>Populations and Ecosystems Resources</u> pp. 46-57,58-63 <u>Populations and Ecosystems CD-ROM</u> <u>Environments FOSS Science Stories</u> pp. 43-44</p> <p><u>Environments FOSS Science Stories</u> pp. 9-17, 21-22, 38 Living Systems Investigation 3, Parts 1-2, pp. 118-135 (sugar and cells) <u>Living Systems FOSS Science Resources</u> pp. 31-36, 47-48 Diversity of Life Investigation 1, Parts 1-2, pp. 43-63 <u>Diversity of Life Resources</u> pp. 21-34</p> <p><u>Food and Nutrition FOSS Science Stories</u> pp.16-19 <u>Environments FOSS Science Stories</u> p. 17 Human Brain and Senses</p>
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<p>Investigate and explain how behavior is a response to internal and external stimuli.</p> <p>Investigate and explain how an organism's behavior evolves through environmental adaptation.</p> <p>8.4.4 By the end of eighth grade, students will develop an understanding of populations and ecosystems.</p> <p>Student demonstrations:</p> <p>Investigate and describe that a population consists of all individuals of a species at a given place and time.</p> <p>Investigate and describe the living and nonliving factors, such as air, water, and light that determine the number of organisms an ecosystem can support.</p> <p>Describe an organism by the function it serves in an ecosystem, such as producer, consumer, and decomposer.</p>	<p>Investigation 2, Part 1, pp. 67-72 (pupil movement)</p> <p><u>Environments FOSS Science Stories</u> pp. 2-6, 10-17</p> <p>Diversity of Life Investigation 9, Parts 1-2, pp. 273-285 (hissing roaches)</p> <p>Human Brain and Senses Investigation 1, Parts 1-4, pp. 37-59 (learning and memory)</p> <p><u>Human Brain and Senses Resources</u> pp. 23-30,36-38,40-44</p> <p><u>Human Brain and Senses CD-ROM</u></p> <p><u>Variables FOSS Science Stories</u> pp. 5-6</p> <p><u>Environments FOSS Science Stories</u> pp. 2, 6, 10-17,22-26</p> <p>Populations and Ecosystems Investigation 8, Parts 1-2, pp. 228-243 (adaptations)</p> <p><u>Populations and Ecosystems Resources</u> pp. 42-45</p> <p><u>Populations and Ecosystems CD-ROM</u></p> <p>Environments Investigation 1, Part 1, pp. 8-15</p> <p><u>Environments FOSS Science Stories</u> pp. 39-41</p> <p>Populations and Ecosystems Investigation 2, Parts 1-2, pp. 70-79</p> <p><u>Populations and Ecosystems Resources</u> pp. 6-13,17-24</p> <p><u>Populations and Ecosystems CD-ROM</u></p> <p>Environments Investigation 1, Parts 1-2, pp. 8-19</p> <p><u>Environments FOSS Science Stories</u> pp. 10-12, 14-17</p> <p>Populations and Ecosystems Investigation 3, Parts 1-3, pp. 90-107 (mini-ecosystems)</p> <p><u>Populations and Ecosystems Resources</u> pp. 6-13,22-24,25-29</p> <p><u>Populations and Ecosystems CD-ROM</u></p> <p><u>Environments FOSS Science Stories</u> pp. 39-41</p> <p>Populations and Ecosystems Investigation 5, Parts 2-4, pp. 151-169 Investigation 7 (Ecoscenarios)</p> <p><u>Populations and Ecosystems Resources</u></p>
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Investigate and explain how energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis, and that energy then passes from organism to organism in food webs.

8.4.5 By the end of eighth grade, students will develop an understanding of diversity and adaptations of organisms.

Student demonstrations:

Analyze internal structures, similarity of chemical processes, and evidence of common ancestry to explain the unity among organisms.

Investigate and explain how organisms adapt to living and nonliving factors in a biome.

Investigate and explain how environmental changes created by nature and by humans may cause species extinction.

8.5 Earth and Space Science

Earth and space science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.

8.5.1 By the end of eighth grade, students will develop an understanding of the structure of the earth.

pp. 14-21, 25-29

Populations and Ecosystems CD-ROM

Solar Energy FOSS Science Stories pp. 1-2
Living Systems

Investigation 3, Parts 1-2, pp. 118-135 (sugar and cells)

Living Systems FOSS Science Resources
pp. 31-36, 47-48

Environments FOSS Science Stories
pp. 27-28

Populations and Ecosystems

Investigation 5, Parts 2-4, pp. 151-169

Investigation 7 (Ecoscenarios)

Populations and Ecosystems Resources
pp. 14-21,25-29

Populations and Ecosystems CD-ROM

Diversity of Life

Investigations 3, 10

Diversity of Life Resources pp. 27-30,65-70

Environments FOSS Science Stories
pp. 1-17, 22, 23-35,38-41

Earth History Resources p. 85

Populations and Ecosystems

Investigation 3, Parts 1-3, pp. 90-107 (mini-ecosystems)

Populations and Ecosystems Resources
pp. 6-13,22-24,25-29

Populations and Ecosystems CD-ROM

Planetary Science Resources pp. 67-69

Earth History

Investigation 7, Parts 1-2, pp. 234-243

Earth History Resources pp. 83-86

Populations and Ecosystems

Investigation 10, Parts 1-3, pp. 302-317
(natural selection)

Populations and Ecosystems Resources
pp. 25-29,58-63

Populations and Ecosystems CD-ROM

Student demonstrations:

Investigate and diagram the crust, mantle, and core of the earth.

Investigate and describe how a combination of constructive and destructive weathering and erosion forces create land forms.

Investigate and describe the composition of soils.

Investigate and describe the water cycle.

Investigate and describe the composition of the atmosphere at different altitudes.

Investigate and describe the major impact of topography, location, and oceans on climate.

Investigate and describe the effect of living organisms on weathering, the composition of rocks, and the atmosphere.

Landforms FOSS Science Stories pp. 27-29
Earth History Resources pp. 100-103

Landforms

Investigation 3, Parts 1-3, pp. 8-24 (stream tables)

Landforms FOSS Science Stories pp. 27-34
FOSS Web Movie: Volcanic Eruption

Earth History

Investigation 3, Parts 3-4, pp. 102-107 (Grand Canyon)

Earth History Resources pp. 3-28, 73-75, 100-103

Earth History

Investigation 4, Parts 1-2, pp. 127-127

Solar Energy FOSS Science Stories p.18-21

Water Planet

Investigation 4, Part 1, pp. 184-197 (water cycle)

Water Planet FOSS Science Resources pp. 67-70

Weather and Water

Investigation 7, Parts 1-2, pp. 218-229

Weather and Water CD-ROM

Mixtures and Solutions FOSS Science Stories pp.18-20

Weather and Water

Investigation 2, Parts 1-2, pp. 64-77 (Earth's atmosphere)

Weather and Water Resources pp. 6-11
Weather and Water CD-ROM

Solar Energy FOSS Science Stories pp. 2, 18-20

Water Planet

Investigation 4, Part 2, pp. 198-203 (severe weather)

Water Planet FOSS Science Resources pp. 71-79

Weather and Water

Investigations 6, 7 and 9

Weather and Water CD-ROM

Populations and Ecosystems

Investigation 7 "Ecoscenarios"

Populations and Ecosystems Resources pp. 30-41

Populations and Ecosystems CD-ROM

Environments FOSS Science Stories p. 37

Solar Energy FOSS Science Stories p. 2

Earth History Resources pp. 70-71

Diversity of Life Resources pp. 66-68

8.5.2 By the end of eighth grade, students will develop an understanding of the earth's history.

Student demonstrations:

Investigate and understand how earth processes that occur today, such as weather and natural catastrophes, are similar to those that occurred in the past.

Investigate and use the fossil record to provide evidence and explain how environmental conditions have changed.

8.5.3 By the end of eighth grade, students will develop an understanding of the earth in the solar system.

Student demonstrations:

Investigate and list the components of the solar system, galaxies, and universe.

Investigate and describe the motion of solar system objects in terms of the concepts of day, year, seasons, eclipses, and phases of the moon.

Investigate and describe gravity's relationship to the solar system.

Landforms

Investigations 2 and 3 (stream table studies)

Landforms FOSS Science Stories pp. 27-34

Earth History

Investigation 5, Parts 3-4, pp. 183-193

Earth History Resources pp. 73-79, 83-88

Planetary Science Resources pp. 67-73

Models and Designs FOSS Science Stories pp. 13-16

Earth History throughout, such as

Investigation 7, Parts 1-2, pp. 234-243

Earth History Resources pp. 38-41

Earth History CD-ROM: Geology Lab:

Fossilization Process

Models and Designs FOSS Science Stories pp. 8-9

Solar Energy FOSS Science Stories pp. 3-4

Water Planet

Investigation 1, Part 1, pp. 50-58 (solar system)

Water Planet FOSS Science Resources pp. 1-13

Planetary Science

Investigations 2-10

Planetary Science Resources pp. 35,43, 80-103

Planetary Science CD-ROM: Solar System

Solar Energy

Investigation 1, Parts 1-2, pp. 8-21 (shadows)

FOSS Web Activity: Lunar Calendar

Planetary Science

Investigation 3 (day/night)

Investigation 9 (moon phases)

Planetary Science Resources pp. 32,36-38

Planetary Science CD-ROM: Day and Night

Weather and Water

Investigation 3 (seasons and sun)

Weather and Water Resources pp. 17-19

Weather and Water CD-ROM

Models and Designs FOSS Science Stories p.10

Water Planet

Investigation 1, Part 2, pp. 59-66 (gravity)

Investigate and understand that the sun is a major source of energy for phenomena in the atmosphere and on the earth's surface.

Investigate and describe the effect of the tilt of the earth's axis on seasons.

8.6 Science and Technology

An understanding of science and technology establishes connections between the natural and designed world, linking science and technology.

8.6.1 By the end of eighth grade, students will develop an understanding of technological design.

Student demonstrations:

Identify appropriate problems for technological design.

Design a solution or product.

Water Planet FOSS Science Resources pp. 16-17

Planetary Science Resources pp. 69-70, 84

Solar Energy FOSS Science Stories pp. 1-2, 18-20

Water Planet

Investigation 3, Parts 1-2, pp. 125-144 (heating earth)

Water Planet FOSS Science Resources pp. 42-51

Environments

Investigation 1, Part 2, pp. 16-19

Environments FOSS Science Stories p. 33

Weather and Water

Investigation 3 (seasons and sun)

Weather and Water Resources pp. 17-26

Planetary Science CD-ROM: Sun

Water Planet FOSS Science Resources pp. 45

Weather and Water

Investigation 3 (Seasons and Sun)

Weather and Water Resources pp. 17-19

Weather and Water CD-ROM

Note that the technological design process, including testing, is a focus of the module **Models and Designs, though** it is embedded in other FOSS modules as well.

Models and Designs throughout, such as

Investigation 3, Parts 1-2, pp. 8-19

Investigation 4, Part 2, pp. 11-15

Models and Designs FOSS Science Stories pp. 21-40

Electronics Investigation 9, Part 2, pp. 290-297

Electronics Resources pp. 18-21

Electronics CD-ROM: Work Bench

Force and Motion throughout, such as

Investigation 5, Parts 1-4, pp. 169-201

Investigation 8, Parts 1-2, pp. 284-301

Force and Motion Resources

Pages 3-6, 41-49

Force and Motion CD-ROM

Models and Designs

Investigation 4, Part 2, pp. 11-15

Electronics Investigation 9, Part 2, pp. 290-297

Electronics CD-ROM: Work Bench

<p>Implement a proposed design.</p> <p>Evaluate completed technological designs or products.</p> <p>Communicate the process of technological design.</p> <p>8.6.2 By the end of eighth grade, students will develop an understanding of science and technology.</p> <p>Student demonstrations:</p> <p>Distinguish between scientific inquiry (asking questions about the natural world) and technological design (using science to solve practical problems).</p> <p>Describe how science and technology are reciprocal.</p> <p>List the avoidable and unavoidable limits of a technological design.</p>	<p>Force and Motion Investigation 8, Part 2, pp. 294-301</p> <p>Models and Designs Investigation 4, Part 2, pp. 11-15 Electronics Investigation 9, Part 2, pp. 290-297 <u>Electronics CD-ROM: Work Bench</u> Force and Motion Investigation 8, Part 2, pp. 294-301</p> <p>Models and Designs Investigation 4, Part 2, pp. 11-15 Electronics Investigation 9, Part 2, pp. 290-297 <u>Electronics CD-ROM: Work Bench</u> Force and Motion Investigation 8, Part 2, pp. 294-301</p> <p>Models and Designs Investigation 4, Part 2, pp. 11-15 <u>Models and Designs FOSS Science Stories</u> pp. 21-40 Electronics Investigation 9, Part 2, pp. 290-297 <u>Electronics CD-ROM: Work Bench</u> Force and Motion Investigation 8, Part 2, pp. 294-301</p> <p>Models and Designs throughout, such as Investigation 3, Parts 1-3, pp. 8-23 <u>Models and Designs FOSS Science Stories</u> Pages 21-40 <u>Variables FOSS Science Stories</u> pp. 18-20 <u>Landforms FOSS Science Stories</u> p. 6 <u>Levers and Pulleys FOSS Science Stories</u> pp. 23-25 <u>Planetary Science Resources</u> pp. 74-77 <u>Electronics Resources</u> pp. 18-21</p> <p><u>Landforms FOSS Science Stories</u> pp. 35-36 <u>Models and Designs FOSS Science Stories</u> Pages 9, 21-40 <u>Earth History Resources</u> pp. 64-65 <u>Planetary Science Resources</u> pp. 74-82, 90-103 <u>Populations and Ecosystems Resources</u> pp. 8-13 “Biosphere 2”</p> <p><u>Models and Designs FOSS Science Stories</u> pp. 31-33 <u>Solar Energy FOSS Science Stories</u> pp. 22-24, 31-32</p>
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Recognize that solutions have intended and unintended consequences.

8.7 Science in Personal and Social Perspectives

A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.

8.7.1 By the end of eighth grade, students will develop an understanding of personal health.

Student demonstrations:

Research and identify substances harmful to human beings in the natural environment, such as radon, lead, and nitrates.

Investigate and explain how personal choices can directly affect a person's health, such as exercise, nutrition, and use of drugs.

8.7.2 By the end of eighth grade, students will develop an understanding of populations, resources, and environments.

Student demonstrations:

Investigate and describe how population levels affect resources and the environment.

Electronics Investigation 4, Parts 1-2, pp. 143-151

Electronics CD-ROM "Work Bench"

Electronics Resources pp. 1-2,18-21,23-25,34-36

Landforms FOSS Science Stories pp. 13-14, 19-21, 43-44

Models and Designs FOSS Science Stories pp. 25, 30, 35-36

Earth History Resources pp. 64-65

Populations and Ecosystems

Investigation 7 (Ecoscenarios)

Populations and Ecosystems Resources pp. 8-13, 30-41,58-59

Populations and Ecosystems CD-ROM

Food and Nutrition

Investigation 4, Parts 1-2, pp. 8-20 (food choices)

FOSS Web Activity: What's for Dinner

Food and Nutrition FOSS Science Stories pp. 27-29, 37-40

Mixtures and Solutions FOSS Science Stories pp. 11-15

Solar Energy FOSS Science Stories pp. 12-15

Human Brain and Senses CD-ROM: Lab EEG

Chemical Interactions

Investigation 2, Part 2, pp. 75-80

Chemical Interactions Resources Pages 7-8,11-13,60-61

Environments FOSS Science Stories pp. 1-17, 27-41

Populations and Ecosystems

Investigations 1-8

Investigate and understand that the causes of environmental degradation and resource depletion vary locally and globally.

8.7.3 By the end of eighth grade, students will develop an understanding of natural hazards.

Student demonstrations:

Investigate and describe the effect of natural hazards on the environment, such as earthquakes, landslides, wildfires, floods, and storms.

Investigate and describe human activities, such as urban growth, land use, and waste disposal, which can accelerate many natural changes.

8.7.4 By the end of eighth grade, students will develop an understanding of risks and benefits.

Student demonstrations:

Analyze a type of hazard, such as natural, chemical, or biological, estimating the number of people that might be exposed and the number likely to suffer consequences.

Populations and Ecosystems Resources
pp. 8-13, 17-21,31,32-45,58-63
Populations and Ecosystems CD-ROM

Water Planet
Investigation 4, Part 4, pp. 212-216 (water)
Water Planet FOSS Science Resources pp. 65-66
Weather and Water
Investigations 7 and 9 (global warming)
Weather and Water Resources pp. 63-76
Weather and Water CD-ROM

Landforms FOSS Science Stories pp. 19-21
Solar Energy FOSS Science Stories
pp. 18-21
Water Planet
Investigation 4, Part 2, pp. 198-203 (severe weather)
Water Planet FOSS Science Resources pp. 71-79
Planetary Science Resources pp. 67-68
Weather and Water
Investigation 1, Parts 1-2, pp. 69-80
Weather and Water Resources pp. 67-76
Weather and Water CD-ROM

Landforms FOSS Science Stories
Pp. 13-14,19-21, 43-44
Mixtures and Solutions FOSS Science Stories pp. 2, 19-20
Environments FOSS Science Stories pp. 35-37, 39-40
Earth History Resources pp. 64-67
Weather and Water
Investigation 9, Parts 3-4, pp. 311-318
Weather and Water Resources pp. 45-47, 63-76
Weather and Water CD-ROM
Populations and Ecosystems
Investigation 7 “Ecoscenarios”
Populations and Ecosystems Resources
pp. 8-13,30-41
Populations and Ecosystems CD-ROM

Landforms FOSS Science Stories pp.13-14
Weather and Water Resources pp. 63-76

Describe how perceptions of risks and benefits influence personal and social decisions, such as seat belt usage and waste disposal procedures.

8.7.5 By the end of eighth grade, students will develop an understanding of science and technology in society.

Student demonstrations:

Understand the effect of science on society is neither entirely beneficial nor entirely detrimental.

Understand that societal challenges often inspire questions for scientific research, but that science cannot answer all questions and technology cannot solve all human problems or meet all human needs.

State an example of when societal priorities influenced research priorities.

Practice the ethical codes followed by scientists, such as informing research subjects about risks and benefits, humane treatment of animals, and truth in reporting.

8.8 History and Nature of

Environments FOSS Science Stories
pp. 36-37, 39-40, 42

Electronics Resources pp. 18-21

Force and Motion

Investigation 8, Parts 1-2, pp. 284-301

Force and Motion Resources Pages 70-74

Models and Designs FOSS Science Stories
Pp. 5-9, 17-40

Food and Nutrition FOSS Science Stories
pp. 6-8

Earth History Resources pp. 76-79

Planetary Science Resources pp. 78-79

Populations and Ecosystems Resources
pp. 8-13,31-41

Environments FOSS Science Stories
pp. 43-44

Food and Nutrition FOSS Science Stories
pp. 24-25

Planetary Science Resources pp. 74-79

Variables FOSS Science Stories pp. 12-14

Models and Designs FOSS Science Stories
p. 4,17-20,23-40

Planetary Science Resources pp. 74-79

Weather and Water Resources pp. 63-66

Chemical Interactions Resources pp. 60-62,
66-67,84-85

Truth in reporting is stressed in ALL FOSS modules as students are expected to report ACTUAL findings, even when they differ from their predictions. See for example:

Human Brain and Senses

Investigation 4, Part 1, pp. 120-128 (field of vision)

Students are expected to treat all living organisms with care and respect. See for example:

Environments

Investigation 2 (Bugs and Beetles)

Diversity of Life

Investigation 8, Parts 1-3, pp. 239-259 (snails)

Investigation 9, Parts 1-3, pp. 273-289
(roaches)

Populations and Ecosystems

Investigation 1, Parts 1-3, pp. 41-59

(milkweed bugs)

Investigation 3, Parts 1-2, pp. 90-107 (mini-ecosystems organisms)

Science

An understanding of the history and nature of science illustrates different aspects of scientific inquiry, the human aspects of science, and the role of science in the development of various cultures.

8.8.1 By the end of eighth grade, students will develop an understanding of science as a human endeavor.

Student demonstrations:

Investigate and understand that women and men of various social and ethnic backgrounds, working alone or in teams engage in the activities of science, engineering, and related fields.

Investigate and understand that scientists have different abilities, basic human qualities, and scientific habits of mind.

8.8.2 By the end of eighth grade, students will develop an understanding of the nature of science.

Student demonstrations:

Formulate and test a hypothesis using observations, experiments, and theoretical and mathematical models.

This standard is met in the “Careers” section of the FOSS web site (www.fossweb.com) for EACH FOSS module. Special effort was made to include examples and role models from different social and ethnic backgrounds.

See also readings in the FOSS Science Stories and Resources books such as:

Mixtures and Solutions FOSS Science Stories pp. 23-25, 30

Water Planet FOSS Science Resources pp. 15, 18-19

Variables FOSS Science Stories pp. 4-6

Planetary Science Resources pp. 52-53, 59-62, 71-73, 101-103

Earth History Resources pp. 64-67, 75

Chemical Interactions Resources pp. 4-8,60, 69-72, 78-85

Force and Motion Resources pp. 11-16

Food and Nutrition FOSS Science Stories pp. 24-26

Variables FOSS Science Stories pp. 4-6

Earth History Resources pp. 64-67, 75, 87, 98-99

Populations and Ecosystems

Investigation 4, Parts 1-2, pp. 119-129 (David Gaines and the Mono Lake Committee)

Populations and Ecosystems Resources pp. 8-13,25-29,46-55

Planetary Science Resources pp. 52-53, 62, 71-73

Earth History Resources pp. 49-67,83-88,98-99

Chemical Interactions Resources pp. 4-8,60, 69-72, 78-85

Since FOSS is an inquiry-based program, this standard is addressed in all FOSS modules for Grades 5-8. See for example:

Distinguish between scientific fact and scientific theory.

8.8.3 By the end of eighth grade, students will develop an understanding of the history of science.

Student demonstration:

Research and report on the difficulties experienced by a scientific innovator who had to overcome flawed, commonly held beliefs of his/her time to reach conclusions that we now take for granted.

Variables FOSS Science Stories pp. 4-5
Food and Nutrition FOSS Science Stories
pp. 26,34-36
Water Planet
Investigation 2, Parts 2-3, pp. 136-157 (water vapor)
Living Systems
Investigation 2, Part 1, pp. 85-98 (celery)
Planetary Science Resources pp. 47-53, 59-73
Populations and Ecosystems Resources
pp. 46-55
Earth History Investigation 8, Part 2, pp. 259-265
Earth History Resources pp. 83-87 (including Lamarck and Darwin)

Food and Nutrition FOSS Science Stories
pp. 9,26, 34-36
Variables FOSS Science Stories
pp. 1-7,12-14
Planetary Science Resources pp. 48-51, 52-53,59- 62, 67-68, 78-79
Populations and Ecosystems pp. 48-55, 62-63
Chemical Interactions Resources pp. 3-8, 69-72

Variables FOSS Science Stories pp.4-6
Models and Designs FOSS Science Stories
pp. 6-9
Planetary Science
Investigation 5, Parts 1-4, pp. 154-173 (Gene Shoemaker/Moon crater controversy)
Planetary Science Resources pp. 48-51, 52-53,59- 62, 67-68, 78-79
Planetary Science CD-ROM (Note flat earth/round earth globe)
Populations and Ecosystems pp. 48-55 (including Mendel and DNA discoveries)
Chemical Interactions Resources pp. 3-8, 69-72
Chemical Interactions CD-ROM
Force and Motion
Investigation 7, Part 3, pp. 267-272
Force and Motion Resources pp. 50-52