



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

Correlation to

**Delaware**  
Science Curriculum Framework



# Delaware

## Science Curriculum Framework

### Correlation with Full Option Science System (FOSS™)

**The following correlation of the Delaware Science Curriculum Framework to the Full Option Science System (FOSS) is to show representative examples of investigations and activities that address listed standards and their objectives. A citation does not reflect all of the investigations or activities from FOSS that might address a particular standard or objective.**

*May, 2005*  
*Updated October, 2008*

# Grades K-3

## Standard One Nature and Application of Science and Technology

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Science as Inquiry</b></p> <ol style="list-style-type: none"> <li>1. Scientists' curiosity about the natural world leads them to ask questions about how things work. In order to answer these questions, scientists observe and explore things carefully.</li> <li>2. Scientists sometimes observe the same object or event and describe it differently. It is important for scientists to describe things as accurately as possible in order to compare their observations.</li> <li>3. Scientists use a variety of instruments, some of them quite simple, in order to obtain additional information for answering questions about the world.</li> <li>4. Graphs and charts are used to better visualize the results of observation and measurement, and are an important part of describing what counts as suitable evidence in answering questions.</li> </ol>	<p><b>Animals Two by Two</b> Investigation 2, Parts 1, 3</p> <p><b>Insects</b> Investigation 3, Parts 2-4</p> <p><b>Balance and Motion</b> Investigation 1, Parts 1-3</p> <p><b>Ideas and Inventions</b> Investigation 3, Part 1</p> <p><b>Sun, Moon and Stars</b> Investigation 1, Part 2</p> <p><b>Wood and Paper</b> Investigation 1, Parts 1-2</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 2, Parts 2-4</p> <p><b>Solids and Liquids</b> Investigation 1, Part 1 Investigation 2, Part 2</p> <p><b>Earth Materials</b> Investigation 1, Parts 1-3</p> <p><b>Matter and Energy</b> Investigation 4, Part 3</p> <p><b>Fabric</b> Investigation 1, Part 4</p> <p><b>Air and Weather</b> Investigation 2, Parts 2, 4</p> <p><b>Insects</b> Investigation 1, Parts 1, 2</p> <p><b>Measurement</b> Investigation 2, Parts 1-3</p> <p><b>Matter and Energy</b> Investigation 3, Parts 2-3</p> <p><b>New Plants</b> Investigation 1, Parts 1-3</p> <p><b>Air and Weather</b> Investigation 4, Part 1</p> <p><b>Magnetism and Electricity</b> Investigation 4, Part 2</p> <p><b>Measurement</b> Investigation 4, Part 2</p> <p><b>Matter and Energy</b> Investigation 3, Part 2</p>
<p style="text-align: center;"><b>Science, Technology, and Society</b></p> <ol style="list-style-type: none"> <li>1. People have always invented ways to solve problems and get work done. These new inventions affect all aspects of life.</li> </ol>	<p><b>Wood and Paper</b> Science Stories, pgs 13-18</p> <p><b>Pebbles, Sand, and Silt</b> Science Stories, pgs 14-17</p> <p><b>Air and Weather</b> Science Stories, pgs 14-15</p> <p><b>Ideas and Inventions</b> Science Stories, pgs 1-3, 9-10, 17-22</p> <p><b>Sun, Moon and Stars</b> Science Resources, pgs 40-43</p>

<b>History and Context of Science</b>	
<p>1. People from all parts of the world have practiced science and have made many important scientific contributions.</p> <p>2. Many men and women have chosen science as a career and a life-time activity because of their intense interest in better understanding nature and the great joy this pursuit brings them.</p>	<p><b>Magnetism and Electricity</b> Science Stories, pgs 17-19</p> <p><b>Measurement</b> Science Stories, pgs 11-12</p> <p><b>Human Body</b> Science Stories, pgs 21-24</p> <p><b>Sun, Moon and Stars</b> Science Resources, pgs 40, 44-45</p> <p><b>Air and Weather</b> Science Stories, pgs 14-15</p> <p><b>Structures of Life</b> Science Stories, pgs 6-9</p> <p><b>Human Body</b> Science Stories, pgs 5-7</p> <p><b>Magnetism and Electricity</b> Science Stories, pgs 6-16</p> <p><b>Sun, Moon and Stars</b> Science Resources, pgs 44-46</p>

## Standard Two Materials and Their Properties

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p><b>Properties and Structure of Materials</b></p> <ol style="list-style-type: none"> <li>1. Objects can be classified according to physical properties such as size, shape, weight, texture, color, and material composition such as wood, metal, plastic, or cloth. These properties can be observed and measured using tools such as rulers, balances, magnifiers, and thermometers.</li> <li>2. Materials exist in one of three states – solid, liquid, or gas – and can be changed from state to another. Each state has distinct physical properties. Physical properties and changes from one state to another are strongly influenced by heating and cooling.</li> <li>3. Objects and materials may be composed of structures too small to be seen without the use of a tool such as a magnifier.</li> </ol>	<p><b>Wood and Paper</b> Investigation 1, Parts 1-3 Investigation 3, Part 1 <b>Pebbles, Sand, and Silt</b> Investigation 1, Parts 3, 4 <b>Solids and Liquids</b> Investigation 1, Part 2 <b>Earth Materials</b> Investigation 1, Parts 1-3 <b>Matter and Energy</b> Investigation 3, Parts 1-3 Investigation 4, Part 1 Science Resources, pgs 39-42</p> <p><b>Solids and Liquids</b> Investigation 4, Science Extension, p. 29 Science Stories, pgs 14-17 <b>Air and Weather</b> Investigation 2 Science Extension, pg 32 <b>Water</b> Investigation 2, Part 3 Investigation 3, Parts 1-3 Science Stories, pgs 1-2, 8-10 <b>Matter and Energy</b> Investigation 3, Part 1 Investigation 4, Parts 1-3 Science Resources, pgs 39-42, 49-50, 54-56</p> <p><b>Fabric</b> Investigation 1, Part 4 <b>Pebbles, Sand, and Silt</b> Investigation 2, Part 3 <b>Insects</b> Investigation 1, Parts 1-3 <b>Ideas and Inventions</b> Investigation 2, Parts 1-2 <b>Matter and Energy</b> Investigation 4, Part 2 Science Resources, pgs 57-59</p>

<p style="text-align: center;"><b>Changes in Materials</b></p> <p>1. Physical properties of materials can be changed by exposure to heat, light, pressure, and chemicals or by cutting, mixing, and grinding. Not all materials respond the same way to these treatments.</p>	<p><b>Wood</b> Investigation 2, Parts 1, 2  <b>New Plants</b> Investigation 2, Part 2  <b>Solids and Liquids</b> Investigation 4, Parts 1, 2  <b>Water</b> Investigation 2, Part 3  Investigation 3, Part 1  <b>Matter and Energy</b> Investigation 4, Parts 2-3  Science Resources pgs 39-42</p>
<p style="text-align: center;"><b>Mixtures</b></p> <p>1. Physical mixtures such as trail mix, tossed salad, and iron filings/sand, are composed of different kinds of materials, each having distinct physical properties. Physical property differences can often be used to separate, sort, and group the materials of a mixture.</p>	<p><b>Solids and Liquids</b> Investigation 3, Parts 2, 4  <b>Pebbles, Sand, and Silt</b>  Investigation 1, Parts 1-3  Investigation 2, Parts 1-4  <b>Earth Materials</b> Investigation 2, Part 2  <b>Magnetism and Electricity</b>  Investigation 1, Part 1</p>
<p style="text-align: center;"><b>Material Technology</b></p> <p>1. The properties of a material or an object influence how the material or object is used. Some materials are more suitable than others for making a particular product or device.</p> <p>2. Technology has created and introduced new materials to help people solve problems. In some cases a new material may solve one problem, but create another one.</p>	<p><b>Wood and Paper</b> Investigation 2, Parts 2-4  <b>Fabric</b> Investigation 1, Parts 5, 6  <b>Pebbles, Sand, and Silt</b>  Investigation 3, Parts 1-5  Science Stories, pgs 14-17  <b>Magnetism and Electricity</b>  Science Stories, pgs 12-15</p> <p><b>Wood and Paper</b> Science Stories, pgs 13-18  <b>Fabric</b> Science Stories, pgs 12-17  <b>Pebbles, Sand, and Silt</b>  Science Stories, pgs 14-17  <b>Ideas and Inventions</b>  Science Stories, pgs 1-3</p>

## Standard Three Energy and Its Effects

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Forms/Sources of Energy</b>	
<ol style="list-style-type: none"> <li>1. The sun is the source of heat and light that warms the earth.</li> <li>2. Sound is produced when objects vibrate. Various characteristics of sound such as loudness/softness and high pitch/low pitch can be changed by altering the material producing the sound.</li> <li>3. Force is any push or pull exerted by one body on another. Pushes and/or pulls change the position, motion, direction (and occasionally the shape) of an object. The greater the push or pull, the greater the change in position, motion, and direction.</li> <li>4. Moving objects exhibit different kinds of motion such as fast, slow, straight, back and forth, circular, and zig-zag. The application of pushes or pulls is required to produce any change in the type of motion, including stopping and starting an object in motion.</li> <li>5. Some forces (e.g., magnetism, static electricity) can make things move without touching them.</li> </ol>	<p><b>Air and Weather</b> Investigation 2, Part 2 Investigation 4, Part 2 Science Stories, pg 21</p> <p><b>Water</b> Investigation 3, Part 2 Science Stories, pgs 14-16</p> <p><b>Matter and Energy</b> Science Resources, pg 1</p> <p><b>Sun, Moon and Stars</b> Science Resources, pgs 1-2</p> <p><b>Physics of Sound</b> Investigation 1, Part 3 Investigation 2, Parts 1-3 Investigation 3, Parts 1, 2 Science Stories, pgs 6, 11-22</p> <p><b>Wood and Paper</b> Investigation 1, Part 4</p> <p><b>Balance and Motion</b> Investigations 2-4 Science Stories, pgs 10-23</p> <p><b>Air and Weather</b> Investigation 3, Parts 1-5</p> <p><b>Human Body</b> Investigation 3, Parts 1-3</p> <p><b>Animals Two by Two</b> Investigation 1, Part 4</p> <p><b>Air and Weather</b> Investigation 3, Parts 1-5</p> <p><b>Balance and Motion</b> Investigation 2, Parts 1-3</p> <p><b>Human Body</b> Investigation 3, Parts 1-3</p> <p><b>Matter and Energy</b> Investigation 3, Parts 1,3</p> <p><b>Solids and Liquids</b> Investigation 3 Science Extension, pg 31</p> <p><b>Magnetism and Electricity</b> Investigation 1, Parts 1-4 Investigation 4, Parts 1, 2 Science Stories, pgs 5-7</p>
<b>Transformation/Conservation of Energy (Energy Changes)</b>	
There are no content statements at this grade cluster.	

<p><b>Production/Consumption/Application of Energy</b></p> <ol style="list-style-type: none"> <li>1. People burn fuels such as wood, oil, coal, or natural gas or use electricity to cook their food and warm their homes.</li> <li>2. The production of heat, light, and electricity uses natural resources, therefore, careful attention should be paid to turning off machines and lights when not in use.</li> <li>3. Heat, Light, electricity, or any form of energy can be harmful or even dangerous if misused. Household electricity can stun or kill a person; sunlight can cause painful sunburn; loud sounds can cause hearing loss or even deafness; microwaves interacting with metal objects can cause sparking.</li> </ol>	<p><b>Physics of Sound</b> Science Stories, pp 22-28  <b>Solids and Liquids</b> Science Stories, pg 14  <b>New Plants</b> Science Stories, pg 17  <b>Water</b> FOSS Web, Activity: Match the Resource  <b>Matter and Energy</b>  Science Resources pgs 2-3, 9-10</p> <p><b>Magnetism and Electricity</b>  Investigation 1, pgs 9-11  Science Stories, pgs 8-9  FOSS Web, Pictures  <b>Matter and Energy</b> Investigation 1, pg 58</p>
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## Standard Four Earth in Space

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Earth in Space</b>	
<ol style="list-style-type: none"> <li>1. There are many objects in the Solar System including the Sun, Moon, planets, and comets. Most of the objects are separated by vast space and enormous distances.</li> <li>2. The size of an object appears to change as the observer moves closer to or farther away from the object.</li> </ol>	<p><b>Ideas and Inventions</b> Science Stories, pp 33-38  <b>Air and Weather</b> Investigation 4, Part 3  <b>Sun, Moon and Stars</b> Science Resources, pgs 1-3, 16-17, 19-32</p> <p><b>Ideas and Inventions</b> Science Stories, pp 33-38  <b>Sun, Moon and Stars</b> Investigation 3, Part 2</p>
<b>Interactions in the Solar System</b>	
<ol style="list-style-type: none"> <li>1. Every 24 hours the Earth makes a full rotation on its axis which causes the day and night cycle.</li> <li>2. There are many objects in the sky such as the Sun, Moon, stars, clouds, birds, and airplanes. The patterns of movement of some of these objects such as the Sun, Moon, and stars are cyclic.</li> </ol>	<p><b>Sun, Moon and Stars</b> Science Resources, pg 3</p> <p><b>Air and Weather</b> Investigation 4, Part 3  <b>Measurement</b> FOSS Web, Movie: Satellites in Earth Orbit  <b>Ideas and Inventions</b> Science Stories, pp 33-38  <b>Sun, Moon and Stars</b> Investigation 1, Parts 1-2 Investigation 2, Parts 1-2 Investigation 3, Part 1  Science Resources, pgs 1-3, 6-7, 10-11, 19-32, 36-38</p>
<b>Technology and Applications</b>	
<ol style="list-style-type: none"> <li>1. People who live and work in space need special clothing and equipment. Astronauts wear space suits which are designed and constructed by Delaware scientist to protect themselves from the extreme conditions of space.</li> </ol>	<p><b>Human Body</b> Science Stories, pgs 17-20</p>

## Standard Five Earth's Dynamic Systems

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Components of Earth</b></p> <ol style="list-style-type: none"> <li>1. Earth's materials include rocks, soil, water, and air. Differences exist in all these materials and these differences can be used to sort and classify them.</li> <li>2. The surface of Earth is surrounded by the atmosphere, a thin layer of air that supports life and has physical properties that are measurable and predictable.</li> <li>3. Water exists in different states (solid, liquid, gas) and in different forms such as rain, snow, hail, and vapor, Water is stored in reservoirs, lakes, oceans, ponds, bays, and ice and is a valuable natural resource essential to all living things.</li> </ol> <p style="text-align: center;"><b>Interactions Among Earth's Systems</b></p> <ol style="list-style-type: none"> <li>1. The surface of the Earth changes constantly. Some of these changes happen slowly and are difficult to detect on a daily basis. Other changes happen quickly and result from events as heavy storms, ice storms, hurricanes, and tornadoes.</li> </ol> <p>Repeating patterns can be found in weather and seasonal changes. Plant, animal and human activities are influenced by these patterns.</p>	<p><b>Pebbles, Sand, and Silt</b> Investigation 1, Parts 1-4 Investigation 4, Parts 1, 2 Science Stories, pgs 1-11, 18-21</p> <p><b>Earth Materials</b> Investigation 1, Parts 1-3 Investigation 2, Parts 1, 2 Science Stories, pgs 12-15 FOSS Web Activity, Rock Database</p> <p><b>Water</b> Investigation 1, Parts 1, 2 Science Stories, pgs 1-2</p> <p><b>Air and Weather</b> Investigation 2, Parts 1-4 Investigation 4, Parts 1, 2</p> <p><b>Solids and Liquids</b> Investigation 4, Science Extension, pg 29 Science Stories, pg 16</p> <p><b>Air and Weather</b> Investigation 2, Science Extension, pg 32</p> <p><b>Water</b> Investigation 1, Part 1 Investigation 2, Part 3 Science Stories, pgs 1-2, 8-17</p> <p><b>Pebbles, Sand, and Silt</b> Science Stories, pgs 3-13</p> <p><b>Earth Materials</b> Science Stories, pgs 1-7</p> <p><b>Water</b> Science Stories, pgs 22-23 FOSS Web, Movie: Grand Canyon Rapids</p> <p><b>Trees</b> Investigation 3, Parts 1-9 Science Stories, pgs 14-23</p> <p><b>Air and Weather</b> Investigation 4, Parts 1, 2 Science Stories, pgs 18-23</p>
<p style="text-align: center;"><b>Technology and Applications</b></p> <ol style="list-style-type: none"> <li>1. Technology enables meteorologists to predict changing patterns. Weather forecasts influence decisions concerning human activity.</li> </ol>	<p><b>Air and Weather</b> Investigation 2, Parts 1-4 Investigation 3, Parts 2, 4 Investigation 4, Part 1</p>

## Standard Six Life Processes

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Characteristics of Living Things</b></p> <p>1. Plants and animals are alive and have characteristics that make them different from each other and non-living things.</p>	<p><b>Animals Two by Two</b> Investigation 1, Parts 1, 4</p> <p><b>Trees</b> Investigation 1, Part 1, 5, 6 Science Stories, pg 3</p> <p><b>Insects</b> Investigations 1-6 Science Stories, pgs 3-21</p> <p><b>New Plants</b> Science Stories, pgs 3-7</p> <p><b>Plants and Animals</b> Investigations 1-4, all parts Science Resources, pgs 3-50</p> <p><b>Insects and Plants</b> Investigations 1-5, all parts Science Resources, pgs 3-55</p>
<p style="text-align: center;"><b>Requirements for Survival</b></p> <p>1. The human body has parts that perform many different functions such as legs for walking, eyes for seeing, a mouth for talking and eating, and hands for holding. The human brain sends messages to all body parts so that they work properly and work together.</p>	<p><b>Human Body</b> Investigation 1, Parts 1, 2 Investigation 2, Parts 1-4 Investigation 3, Parts 1-3 Science Stories, pgs 1-4, 10, 12-16, 28-29 FOSS Web, Activity: Mr. Bones</p>
<p style="text-align: center;"><b>Health and Technology Application</b></p> <p>1. A well-balanced diet, adequate rest, exercise, and good hygiene are essential for people to stay healthy.</p>	<p><b>Human Body</b> Science Stories, pgs 25-27 <i>(This standard is covered in depth in <b>Food and Nutrition</b>, a FOSS module for grades 5-6.)</i></p>

## Standard Seven Diversity and Continuity of Living Things

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Heredity and Reproduction</b></p> <ol style="list-style-type: none"> <li>The offspring of plants and animals resemble their parents in many ways although they are not exactly like their parents or each other.</li> <li>The offspring of some plants and animals look very different from their parents when they are first born. Similarities between parents and their offspring become more apparent as the offspring develops.</li> <li>The phases in the life cycle of plants and animals (i.e., birth, growth, reproduction, and death) are predictable and describable but differ from species to species.</li> </ol> <p style="text-align: center;"><b>Diversity</b></p> <ol style="list-style-type: none"> <li>Many different kinds of plants and animals live throughout the world and can be classified or sorted into groups based upon appearance and behavior.</li> </ol>	<p><b>Animals Two by Two</b> Investigation 5, Parts 1-4 <b>Insects</b> Investigation 3, Part 2 Investigation 6, Part 1 Science Stories, pg 21, 36-41 <b>Structures of Life</b> Science Stories, pgs 20-21 <b>Insects and Plants</b> Investigations 3, Part 3 Science Resources, pgs 8-9, 20-24, 42,48-55</p> <p><b>Trees</b> Science Stories, pg 24 <b>Insects</b> Investigation 1, Parts 1-3 Investigation 2, Parts 1-3 Investigation 5, Parts 1-3 Science Stories, pp 36-41 <b>New Plants</b> Investigation 1, Parts 1-3 <b>Insects and Plants</b> Investigation 1, Parts 1-3 Investigation 4, Parts 1-3 Investigation 5, Parts 1-3 Science Resources, pgs 37-47, 50-51</p> <p><b>Insects</b> Investigations 1-5 Science Stories, pgs 16-21 <b>New Plants</b> investigation 1, Parts 1-3 <b>Structures of Life</b> Science Stories, pgs 20-21 FOSS Web, Activity: Life Cycles <b>Plants and Animals</b> Investigations 1-4, all parts Science Resources, pgs 3-50 <b>Insects and Plants</b> Investigations 1-5, all parts Science Resources, pgs 37-55</p> <p><b>Trees</b> Investigation 1, Part 3 Investigation 2, Parts 2-6 <b>Animals Two by Two</b> Investigation 2, Part 2 Investigation 4, Part 2 Science Stories, pgs 3-24 <b>Structures of Life</b> Science Stories, pgs 17-19, 26-27 <b>Plants and Animals</b> Science Resources, pgs 28-45 Video: How Plants Grow indifferent Places</p>

<p style="text-align: center;"><b>Evolution</b></p> <p>1. Plants and animals have features that help them survive and reproduce in different places.</p> <p>2. Fossils provide evidence that present day plants and animals are both similar to and different from those that lived in the past. These fossil records indicate that some [plants and animals that once lived on earth no longer exist.</p>	<p><b>Animals Two by Two</b> Investigation 1, Parts 1-3 Science Stories, pgs 4-11</p> <p><b>New Plants</b> Science Stories, pgs 12-17</p> <p><b>Insects</b> Investigation 5, Parts 1-3 Science Stories, pp 36-41</p> <p><b>Structures of Life</b> Investigation 3, Part 1 Science Stories, pgs 17-25</p> <p><b>Plants and Animals</b> Investigation 1, Part 2 Investigation 3, Parts 1-3 Science Resources, pgs 28-50</p> <p><b>Insects and Plants</b> Investigation 5, Parts 1-3 Science Resources, pgs 30-33</p> <p><b>Pebbles, Sand and Silt</b> Science Stories, pp 26-31</p> <p><b>Earth Materials</b> FOSS Web, Pictures</p>
<p style="text-align: center;"><b>Biotechnology and Its Application</b></p> <p>1. Humans have always applied their knowledge for the varied characteristics of plants and animals to satisfy their needs for food, shelter, and clothing.</p>	<p><b>Fabric</b> Science Stories, pgs 4-23</p> <p><b>Trees</b> Science Stories, pgs 3-8, 13-18</p> <p><b>New Plants</b> Science Stories, pgs 12-17</p> <p><b>Structures of Life</b> Science Stories, pgs 4-5, 10-11</p> <p><b>Plants and Animals</b> Science Resources, pgs 9-14</p>

## Standard Eight Ecology

By the end of the third grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p><b>Interactions Within the World Around Us</b></p> <ol style="list-style-type: none"> <li>The earth consists of living and non-living things. All living things interact with each other and the non-living parts of their surroundings – air, water, soil, and sun.</li> <li>Living things depend on each other in many ways. Animals use plants for shelter, and eat plants and other animals for food. Plants depend on animals to carry their pollen and to disperse their seeds.</li> <li>People depend on living and non-living resources to satisfy the need for food, clothing, shelter, and fuel. Care must be exercised in the use of these resources since, in many cases, their supply is limited.</li> </ol> <p style="text-align: center;"><b>Changes in Environments</b></p> <ol style="list-style-type: none"> <li>Living things change the area in which they live.</li> </ol>	<p><b>Animals Two by Two</b> Investigation 1, Part 2 Investigation 3, Part 2 <b>Trees</b> Investigation 1, Part 2 <b>Insects</b> Investigation 3, Part 2 <b>Structures of Life</b> Investigation 1, Parts 2, 3 Science Stories, pgs 4-5, 28 <b>Plants and Animals</b> Investigation 1, Parts 1-3 Investigation 3, Parts 1-2 Science Resources, pgs 3-7, 16-26, 28-45 <b>Insects and Plants</b> Investigation 2, Parts 1-3 Investigation 3, Parts 2-3 Science Resources, pgs 6-7, 8-13, 26-29</p> <p><b>Animals Two by Two</b> Investigation 1, Part 2 Investigation 3, Part 2 <b>Trees</b> Investigation 1, Part 2 <b>Insects</b> Investigation 3, Part 2 <b>Structures of Life</b> Investigation 4, Part 2 Science Stories, pgs 3, 22-23 <b>Water</b> Science Stories, pgs 5-7 <b>Plants and Animals</b> Investigation 3, Parts 1-2 Science Resources, pgs 16-19, 21-24, 29-30, 32-33, 38-39, 41-42 <b>Insects and Plants</b> Investigation 3, Parts 2-3 Science Resources, pgs 6-7</p> <p><b>Fabric</b> Science Stories, pgs 3-23 <b>New Plants</b> Science Stories, pgs 12-17 <b>Structures of Life</b> Science Stories, pgs 4-5, 10-11 <b>Water</b> Science Stories, pgs 17-23 <b>Plants and Animals</b> Science Resources, pgs 9-13</p> <p><b>Pebbles, Sand, and Silt</b> Science Stories, pgs 14-17 <b>Earth Materials</b> Science Stories, pgs 24-29 <b>Water</b> Science Stories, pgs 17-23 <b>Plants and Animals</b> Science Resources, pgs 33, 36, 39, 41</p>

<p style="text-align: center;"><b>Technology and Its Influence on the Environment</b></p> <ol style="list-style-type: none"> <li>1. Technology continues to be developed which allows many different kinds of materials to be reduced, recycled, and reused.</li>   <li>2. Modern technology enables farmers to increase crop production. Technology also allows food to be stored for long periods and transported long distances without spoiling.</li> </ol>	<p><b>Wood and Paper</b> Investigation 4, Part 1 Science Stories, pg 13</p> <p><b>New Plants</b> Investigation 1, Part 3</p> <p><b>Water</b> Science Stories, pgs 17-21</p> <p><b>Insects and Plants</b> Investigation 1, pg 113</p> <p><b>New Plants</b> Science Stories, pgs 12-17</p> <p><b>Structures of Life</b> Science Stories, pgs 4-11</p> <p><b>Plants and Animals</b> Science Resources, pgs 9-13</p>
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# Grades Four - Five

## Standard One

### Nature and Application of Science and Technology

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Science as Inquiry</b></p> <p>1. Curiosity about nature and the world around us leads scientists to ask questions in a way that requires scientific investigation in order to develop an explanation. The breadth and style of this investigation depend on the questions asked.</p>	<p><b>Water</b> Investigation 3, Parts 1-3  <b>Ideas and Inventions</b> Investigation 3, Part 1  <b>Sun, Moon and Stars</b> Investigation 1, Part 2  <b>Solar Energy</b> Investigation 1, Parts 1, 2  <b>Models and Designs</b> Investigation 1, Parts 1, 2  <b>Living Systems</b> Investigation 3, Part 3</p>
<p>2. In science, answering certain questions requires observation and simple testing to generate additional information and enable a more complete investigation.</p> <p>3. The ability to observe and gather data is enhanced by using a variety of instruments.</p> <p>4. Collaboration, communication, and comparison are important parts of science. Graphs, charts, maps, equations, and oral and written reports can be used to share the results of a scientific investigation and facilitate discussion about it.</p>	<p><b>Magnetism and Electricity</b> Investigation 4, Parts 1, 2  <b>Measurement</b> Investigation 2, Part 3  <b>Landforms</b> Investigation 2, Parts 1-3  <b>Environments</b> Investigation 2, Parts 2-4  <b>Living Systems</b> Investigation 3, Part 2</p> <p><b>Measurement</b> Investigation 4, Parts 1-3  <b>Earth Materials</b> Investigation 1, Parts 1-3  <b>Matter and Energy</b> Investigation 3, Parts 2-3  <b>Levers and Pulleys</b> Investigation 3, Parts 1-3  <b>Solar Energy</b> Investigation 3, Parts 1, 2  <b>Water Planet</b> Investigation 3, Part 1</p> <p><b>Magnetism and Electricity</b> Investigation 1, Parts 3, 4  <b>Sun, Moon and Stars</b> Investigation 2, Part 2  <b>Human Body</b> Investigation 4, Part 2  <b>Matter and Energy</b> Investigation 3, Parts 2-3  <b>Variables</b> Investigation 1, Part 2  <b>Food and Nutrition</b> Investigation 1, Part 2  <b>Water Planet</b> Investigation 3, Part 1</p>
<p style="text-align: center;"><b>Science, Technology, and Society</b></p> <p>1. Science consists of many disciplines such as chemistry, biology, geology, and physics, and in the broadest sense, can be viewed as the collective efforts by people in these disciplines to organize, describe, and understand the natural world.</p>	<p><b>Measurement</b> Science Stories, pgs 14-15  <b>Magnetism and Electricity</b> Science Stories, pgs 8-19  <b>Mixtures and Solutions</b> Science Stories, pgs 31-33  <b>Landforms</b> Science Stories, pgs 13-14</p>

<p>2. Technology applies knowledge to solve problems and to change the world to suit us better. Technological innovation plays an important role in improving the quality of life. Such innovation involves scientific disciplines as well as other disciplines such as engineering, mathematics, medicine, and economics in order to create practical, cost effective solutions to problems and opportunities.</p> <p>3. Technological development improves the quality of our life immensely and continues to do so in many areas such as medicine, communications, transportation, and agriculture. However, not all development is perfect, uniformly beneficial, or equally available to everyone.</p>	<p><b>Ideas and Inventions</b> Science Stories, pgs 17-22</p> <p><b>Magnetism and Electricity</b> Science Stories, pgs 24-25</p> <p><b>Sun, Moon and Stars</b> Science Resources, pgs 40-43</p> <p><b>Models and Designs</b> Science Stories, pgs 33-40</p> <p><b>Variables</b> Science Stories, pgs 32-33</p> <p><b>Water Planet</b> Science Resources, pgs 82-82</p> <p><b>Water</b> Science Stories, pgs 17-20, 23</p> <p><b>Physics of Sound</b> Science Stories, pgs 23-28</p> <p><b>Models and Designs</b> Science Stories, pgs 33-36</p> <p><b>Food and Nutrition</b> Science Stories, pgs 10-13, 19</p>
<p><b>History and Context of Science</b></p> <p>1. Men and women of all ages and from diverse cultures are involved in a multitude of scientific endeavors in the search to better understand nature. These people practice science in many ways and at various depths and levels of complexity. This search continues to add new knowledge to society's understanding of the world.</p>	<p><b>Water</b> Science Stories, pgs 24-26</p> <p><b>Structures of Life</b> Science Stories, pgs 6-9</p> <p><b>Sun, Moon and Stars</b> Science Resources, pgs 44-46</p> <p><b>Solar Energy</b> Science Stories, pg 25</p> <p><b>Food and Nutrition</b> Science Stories, pgs 24-26, 34-36</p> <p><b>Water Planet</b> Science Resources, pgs 15, 18-19</p>

## Standard Two Materials and Their Properties

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Properties and Structure of Materials</b></p> <ol style="list-style-type: none"> <li>1. Observable and measurable properties of materials such as solubility, transparency, magnetic characteristic, strength, and the ability to conduct heat and electricity can be used to identify, group, and classify materials.</li> <li>2. The ability to define structure in detail is limited when objects or materials are studied with the naked eye. The observation and determination of more detailed structure require magnification.</li> </ol> <p style="text-align: center;"><b>Changes in Materials</b></p> <ol style="list-style-type: none"> <li>1. The weight of an object remains unchanged when broken into parts, and the parts together weigh the same as the original object.</li> <li>2. The properties of materials and objects can be changed by interaction with air, moisture, light, heat, and other substances or materials. The structure of materials and objects strongly influences behavior during such interactions.</li> </ol> <p style="text-align: center;"><b>Mixtures and Solutions</b></p> <ol style="list-style-type: none"> <li>1. Most things we deal with everyday are mixtures of component substances. The properties of these mixtures largely depend on the relative amounts and properties of the components. Mixtures can consist of different solid materials or be solutions such as salt or sugar in water.</li> </ol>	<p><b>Magnetism and Electricity</b> Investigation 1, Part 1</p> <p><b>Earth Materials</b> Investigation 2, Part 2</p> <p><b>Food and Nutrition</b> Investigation 1, Parts 1, 2</p> <p><b>Mixtures and Solutions</b> Investigation 1, Parts 1-4</p> <p><b>Ideas and Inventions</b> Investigation 2, Parts 1, 2</p> <p><b>Earth Materials</b> Investigation 1, Parts 1-3</p> <p><b>Environments</b> Investigation 5, Part 3</p> <p><b>Mixtures and Solutions</b> Investigation 2, Part 4</p> <p><b>Measurement</b> Investigation 2, Part 3</p> <p><b>Mixtures and Solutions</b> Investigation 1, Part 2</p> <p><b>Water</b> Investigation 2, Part 3 Investigation 3, Part 1</p> <p><b>Earth Materials</b> Investigation 1, Part 3</p> <p><b>Matter and Energy</b> Investigation 4, Parts 2-3</p> <p><b>Food and Nutrition</b> Investigation 3, Parts 1-3</p> <p><b>Mixtures and Solutions</b> Investigation 1, Parts 1, 2</p> <p><b>Earth Materials</b> Investigation 3, Parts 1, 2</p> <p><b>Matter and Energy</b> Investigation 4, Part 3</p> <p><b>Living Systems</b> Investigation 3, Part 3</p> <p><b>Mixtures and Solutions</b> Investigation 1, Parts 1-4 Investigation 2, Parts 1-3 FOSS Web, Activity: Solution or Mixture</p>

<p style="text-align: center;"><b>Material Technology</b></p> <ol style="list-style-type: none"> <li>1. Through science and technology, new materials are created whose function and performance have advantages over natural materials and lead to benefits for society.</li>   <li>2. The creation of new synthetic materials has challenged individuals and industry to consider both the benefits and the risks in the use of these materials. One current example is the effort to find better ways to discard and recycle different materials.</li> </ol>	<p><b>Ideas and Inventions</b> Science Stories, pgs 1-3, 9</p> <p><b>Mixtures and Solutions</b> Science Stories, pgs 31-33</p> <p><b>Food and Nutrition</b> Science Stories, pg 13</p> <p><b>Mixtures and Solutions</b> Science Stories, pgs 31-33</p> <p><b>Food and Nutrition</b> Science Stories, pg 13</p>
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## Standard Three Energy and Its Effects

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Forms/Sources of Energy</b>	
<p>1. Light is a form of energy which is visible to the eye, spreads from a source, and travels in straight lines. Light is transmitted, reflected, refracted, or absorbed by different materials. Materials which do not transmit light cast shadows.</p> <p>2. Like the sun, many other objects which give off light also produce heat. Heat can also be produced by electrical and mechanical machines and by one object rubbing against another.</p> <p>3. Electricity in circuits can produce light, heat, sound, and magnetic effects. Electrical circuits require a complete loop through which the electrical current can pass.</p> <p>4. When an object is set in motion by a force, its position is defined with reference to the distance it travels and the period of time it takes to travel that distance. Speed is the measure of the distance traveled by a moving object in a given period of time.</p> <p>5. Force must be applied to change the speed or direction of a moving object. The greater the force, the greater the change in motion.</p>	<p><b>Ideas and Inventions</b> Investigation 4, Parts 1-3 Science Stories, pgs 23-27 <b>Matter and Energy</b> Investigation 2, Parts 1-2 <b>Solar Energy</b> Investigation 2, Part 1 Science Stories, pgs 1-5</p> <p><b>Magnetism and Electricity</b> Investigation 2, Part 1 Investigation 3, Parts 1, 2 <b>Matter and Energy</b> Investigation 1, Part 1 Science Resources, pgs 1-3 <b>Solar Energy</b> Science Stories, pgs 22-24</p> <p><b>Magnetism and Electricity</b> Investigation 2, Parts 1, 2 Investigation 3, Parts 1-3 <b>Matter and Energy</b> Investigation 1, Parts 1, 3 Science Resources, pgs 6-7</p> <p><b>Models and Designs</b> Investigation 3, Part 3 <b>Variables</b> Investigation 3, Parts 2, 3 Investigation 4, Part 2</p> <p><b>Water</b> Investigation 4, Part 2 <b>Variables</b> Investigation 3, Parts 2, 3 <b>Models and Designs</b> Investigation 3, Part 2 Science Stories, pp 48-55 <b>Levers and Pulleys</b> Investigation 3, Parts 1-3 Science Stories, pgs 1-3, 16-17</p>

<p><b>Transformation/Conservation of Energy</b></p> <ol style="list-style-type: none"> <li>1. Most of the energy reaching the Earth's surface comes from the sun as light. It is then stored, transferred, or transformed in a variety of ways. Some of the Sun's light is transformed into heat when it hits objects.</li> <li>2. When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all the same temperature.</li> <li>3. An important property of materials is their ability to conduct and transfer heat. Some materials such as certain metals are excellent conductors of heat while other materials such as glass are good insulators. Insulators are used to conserve heat and reduce the cost of heating and cooling homes.</li> </ol>	<p><b>Water</b> Investigation 2, Part 3 Investigation 3, Part 1 <b>Matter and Energy</b> Investigation 1, Part 1 Science Resources, pgs 1-5 <b>Sun, Moon and Stars</b> Science Resources, pgs 1-3 <b>Solar Energy</b> Investigation 2, Part 2 Investigation 3, Parts 1, 2 Science Stories, pgs 1-5</p> <p><b>Mixtures and Solutions</b> Science Stories, pp 37-42 <b>Solar Energy</b> Investigation 2, Part 2 Science Stories, pgs 16-17</p>
<p><b>Production/Consumption/Application of Energy</b></p> <ol style="list-style-type: none"> <li>1. Society uses energy to perform work and improve the quality of life. The attractiveness and extent of the use of the various sources of energy depend on factors such as availability, cost, and the ability to control side effects such as pollution and radiation.</li> </ol>	<p><b>Water</b> Science Stories, pg 23 <b>Solar Energy</b> Science Stories, pgs 22-30 <b>Models and Designs</b> Science Stories, pgs 25, 37-40</p>

## Standard Four Earth in Space

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Solar System Models</b>	
<p>1. Earth's position relative to the Sun affects conditions on earth. Earth's rotation on a tilted axis and its revolution around the Sun causes variations in the amount of solar energy hitting Earth's surface and such variations cause seasons.</p>	<p><b>Ideas and Inventions</b> Science Stories, pp 33-38  <b>Sun, Moon and Stars</b>            Science Resources, pgs 7, 10-11  <b>Water Planet</b>            Science Resources, pgs 42-45</p>
<b>Interactions in the Solar System</b>	
<p>1. The Earth is one of several planets that orbit the Sun. As the Earth orbits the Sun different patterns of stars can be seen in different seasons.</p>	<p><b>Sun, Moon and Stars</b> Investigation 3, Part 1            Science Resources, pgs 16-17  <b>Water Planet</b> Investigation 1, Part 1            Science Resources, pgs 1-13  <b>Models and Designs</b>            Science Stories, pgs 5-7  <b>Solar Energy</b> Science Stories, pp 40-44</p>
<p>2. Rotation of Earth on its axis once every 24 hours causes day and night and makes the Sun, Moon, planets and stars appear to move across the sky from east to west each day.</p>	<p><b>Sun, Moon and Stars</b>            Science Resources, pgs 1-3  <b>Models and Designs</b> Science Stories, pg 2  <b>Ideas and Inventions</b> Science Stories, pp 33-38</p>
<b>Technology and Applications</b>	
<p>1. Technology allows scientists to explore the Solar System and to observe and measure features and structures of the earth, Moon, and other solar objects.</p>	<p><b>Sun, Moon and Stars</b>            Science Resources, pgs 40-43  <b>Models and Designs</b> Science Stories, pg 9  <b>Solar Energy</b> Science Stories, pgs 3-6  <b>Ideas and Inventions</b> Science Stories, pp 33-38</p>

## Standard Five Earth's Dynamic Systems

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Components of Earth</b>	
<ol style="list-style-type: none"> <li>1. Rocks are natural combinations of one or more minerals and are formed under a variety of conditions. Rocks, minerals, and soils are classified according to their physical properties.</li> <li>2. Soil is composed of rock material broken down by weathering and erosion and organic material that is decomposed. A soil's composition varies from place to place and helps determine which plants grow in a particular area.</li> <li>3. Water exists in the air as water vapor (e.g., clouds and fog) and is found on the surface as a liquid or solid, and below the surface as ground water. Water moves throughout Earth's systems by changing phase as a result of condensation and evaporation.</li> </ol>	<p><b>Earth Materials</b> Investigation 1, Parts 1-3 Investigation 2, Parts 1, 2 Investigation 4, Part 1 FOSS Web, Activity: Rock Database</p> <p><b>Water</b> Science Stories, pgs 1-2, 4-9, 12-16 FOSS Web, Pictures: Water Cycle <b>Landforms</b> Science Stories, pgs 30-34 <b>Solar Energy</b> Science Stories, pgs 18-19 <b>Water Planet</b> Investigation 2, Parts 1-4 Investigation 4, Parts 1, 4 Science Resources, pgs 26-30, 33-40, 67-70</p>
<b>Interactions Among Earth's Systems</b>	
<ol style="list-style-type: none"> <li>1. Geologic features of Earth's surface such as mountains, plateaus, plains, lakes, streams, oceans, and glaciers are constantly changing, making the surface of the land different from location to location.</li> </ol>	<p><b>Earth Materials</b> Investigation 3, Science Extension, pg 24 Science Stories, pgs 1-7 <b>Landforms</b> Investigation 2, Parts 1, 2 Investigation 3, Parts 1-3 Science Stories, pgs 13-17, 27-34 FOSS Web, Activity; Jigsaw Puzzle</p>
<b>Technology and Applications</b>	
<ol style="list-style-type: none"> <li>1. Many of Earth's resources are limited or non-renewable. Careful planning and use are necessary to extend their availability.</li> </ol>	<p><b>Water</b> FOSS Web, Activity: Match the Resource <b>Water Planet</b> Science Resources, pgs 65-66</p>

## Standard Six Life Processes

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p><b>Structure and Function Relationship</b></p> <p>1. Living things have structures that function to help them reproduce, grow, and survive in different kinds of places.</p>	<p><b>Human Body</b> Investigation 2, Parts 1-4 Science Stories, pgs 1-4, 12-16, 28-29</p> <p><b>Structures of Life</b> Investigation 3, Part 1 Science Stories, pgs 17-27 FOSS Web, Movie: Jellyfish</p> <p><b>Environments</b> Investigation 2, Parts 1-4</p> <p><b>Food and Nutrition</b> Science Stories, pgs 6-9</p> <p><b>Living Systems</b> Investigation 1, Parts 1-3 Investigation 2, Parts 1-2 Science Resources, pgs 2-13, 16-24</p>
<p><b>Flow of Matter and Energy</b></p> <p>1. All living organisms interact with the living and non-living parts of their surroundings to meet their needs for survival. These interactions lead to a constant exchange of matter and energy. Plants derive energy from the sun for growth and survival. Animals eat plants or other animals that have also eaten plants to satisfy energy needs. When plants and animals die, they are eaten by decomposers.</p>	<p><b>Water</b> Science Stories, pgs 5-7</p> <p><b>Structures of Life</b> Investigation 2, Parts 1, 2 Science Stories pg 28</p> <p><b>Environments</b> Investigation 4, Parts 1-3 Science Stories. pgs 27-28, 39-41 FOSS Web, Activity: Virtual Aquarium</p> <p><b>Living Systems</b> Investigation 1, Part 1 Investigation 3, Parts 1-2 Science Resources, pgs 3-35, 47-48</p>
<p><b>Regulation and Behavior</b></p> <p>1. Living organisms are composed of parts that work together to ensure the survival of the whole organism. The behavior of an organism is influenced by internal clues such as hunger and external clues such as temperature.</p>	<p><b>Human Body</b> Science Stories, pgs 1-3, 10, 12-16, 28-29</p> <p><b>Structures of Life</b> Investigation 3, Part 1 Science Stories, pgs 17-21</p> <p><b>Food and Nutrition</b> Science Stories, pgs 6-9</p> <p><b>Living Systems</b> Investigation 1, Parts 1-3 Investigation 2, Parts 1-2 Science Resources, pgs 2-13, 16-24</p>
<p><b>Health and Technology Applications</b></p> <p>1. Technological advances in medicine, the development of various safety devices and protective equipment, and improvements in hygiene have helped in the diagnosis and treatment of illness and have reduced the number of damaging and life threatening injuries.</p>	<p><b>Physics of Sound</b> Science Stories, pgs 25-28</p> <p><b>Human Body</b> Science Stories, pgs 5-7</p> <p><b>Food and Nutrition</b> Science Stories, pgs 16-19, 24-25, 34-36</p>

## Standard Seven Diversity and Continuity of Living Things

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Heredity and Reproduction</b></p> <p>1. Physical characteristics are passed on from parent to offspring. Organisms with two parents inherit characteristics of both.</p> <p style="text-align: center;"><b>Diversity</b></p> <p>1. Organisms have many distinct and unique features which they use for survival. Specialized features include those for finding food, building shelters, evading predators, and reproducing. Scientists use similarities and differences in these features to classify and group organisms.</p> <p style="text-align: center;"><b>Evolution</b></p> <p>1. Organisms of the same species have variations which may provide an advantage in reproduction and survival.</p> <p style="text-align: center;"><b>Biotechnology and Its Applications</b></p> <p>1. The climate and soils in Delaware are ideal for growing a great variety of fruits and vegetables. Delaware scientists continue to explore ways to improve the growing conditions and quality of these crops.</p>	<p><b>Structures of Life</b> Science Stories, pgs 6-9</p> <p><b>Structures of Life</b> Investigation 3, Part 1 Investigation 4, Parts 1, 2 Science Stories, pgs 17-21, 24-25 <b>Environments</b> Science Stories, pgs 1-22 <b>Living Systems</b> Investigation 2, Part 2 Science Resources, pgs 16-25</p> <p><b>Environments</b> Investigation 3, Parts 1-3 Investigation 6, Parts 1, 2</p> <p>Local Activity</p>

## Standard Eight Ecology

By the end of the fifth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Interactions Within the Environment</b></p> <p>1. All living organisms interact with the living and non-living parts of their surroundings to meet their needs for survival. These interactions lead to constant exchange of matter and energy. Plants derive energy from the sun for growth and survival. Animals eat plants or other animals that have also eaten plants to satisfy energy needs. Dead plants and animals are eaten by decomposers.</p> <p style="text-align: center;"><b>Changes in Environment</b></p> <p>1. Organisms adapt in order to live and reproduce in certain environments. Those organisms that are best suited for a particular environment have adaptations that allow them to compete for available resources and cope with the physical conditions of their immediate surrounds.</p> <p>2. Changes in an organism's environment can be either beneficial or harmful. Organisms may be affected by other organisms, by various physical factors (e.g., rainfall, temperature), by physical forces (e.g., storms, earthquakes), and daily, seasonal, and annual cycles.</p> <p>3. Pollution and human activities can change the environment and adversely affect the health and survival of humans and other species. Careful planning and safe practices are required in waste disposal, recycling and waste management, pest control, and use of resources to ensure the well being of humans and the environment.</p>	<p><b>Water</b> Science Stories, pgs 5-7  <b>Structures of Life</b> Investigation 2, Parts 1, 2            Science Stories pg 28  <b>Environments</b> Investigation 4, Parts 1-3            Science Stories. pgs 27-28, 39-41            FOSS Web, Activity: Virtual Aquarium  <b>Living Systems</b> Investigation 2, Part 1            Investigation 3, Parts 1-2            Science Resources, pgs 16-20, 31-35, 47-48</p> <p><b>Human Body</b> Investigation 3, Parts 1-3            Science Stories, pgs 10- 16  <b>Structures of Life</b>            Investigation 3, Part 1            Investigation 4, Parts 1,2</p> <p><b>Environments</b> Investigation 3, Parts 1-3            Investigation 5, Parts 1-3            Investigation 6, Parts 1, 2            FOSS Web, Activity: Virtual Aquarium</p> <p><b>Water</b> Science Stories, pgs 17-21  <b>Environments</b>            Science Stories, pgs 35-37, 39-41  <b>Landforms</b> Science Stories, pgs 13-14  <b>Water Planet</b> Investigation 4, Part 4            Science Resources, pg 66</p>

**Technology and Its Influence on the Environment**

1. Various technologies are used to access resources or to create conveniences needed by society. In many cases there are significant environmental impacts and resources limitations that need to be considered. Such activities include logging; building of highways, shopping centers, and dams; introduction of one species to control another species; spraying of insects; as well as some aspects of farming.

**Environments** Science Stories, pgs 39, 43  
**Landforms** Science Stories, pgs 13-21  
**Water Planet** Investigation 4, Part 4  
Science Resources, pg 66

# Grades Six - Eight

## Standard One Nature and Application of Science and Technology

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Science as Inquiry</b></p> <p>1. The design of an investigation, in many cases, is determined by the type of questions asked. Therefore, the thoughtful and informed structuring of such questions is an important part of scientific inquiry. For example, a question such as, “What are the similarities and differences among the plants that grow in this region?” requires a taxonomic investigation in which plants are collected, identified, and classified. On the other hand, answering – “What was the reaction of Marie Curie’s contemporaries to her work and accomplishments?” – may involve consulting, reviewing, and discussing both contemporary and historical publications as part of an investigative design. However, an experimental investigation in which systematic observations are made and where data are used and analyzed to construct an explanation could result from a question such as, “How do the physical properties of local soil samples lead to differences in drainage or percolation?”</p> <p>2. The ultimate goal of any scientific investigation is to obtain evidence precise and thorough enough to answer a question. Various experimental designs and strategies can be developed to answer the same question. The comprehensiveness and sophistication of the investigation depend on the tools and techniques used.</p>	<p><b>Models and Designs</b> Investigation 4, Part 3</p> <p><b>Mixtures and Solutions</b> Investigation 4, Part 4</p> <p><b>Water Planet</b> Investigation 3, Part 1</p> <p><b>Human Brain and Senses</b> Investigation 7, Part 2</p> <p><b>Earth History</b> Investigation 4, Part 3</p> <p><b>Chemical Interactions</b> Investigation 8, Part 2</p> <p><b>Variables</b> Investigation 3, Parts 1-4</p> <p><b>Solar Energy</b> Investigation 4, Parts 1-3</p> <p><b>Water Planet</b> Investigation 2, Part 3</p> <p><b>Living Systems</b> Investigation 3, Part 3</p> <p><b>Diversity of Life</b> Investigation 9, Part 2</p> <p><b>Planetary Science</b> Investigation 5, Part 3</p>
<p>3. Explanations in science result from careful and logical analysis of evidence gained from an investigation. Explanations relate causes to effects and develop relationships based on the evidence. Critical analysis of data is</p>	<p><b>Environments</b> Investigation 2, Parts 1-4</p> <p><b>Variables</b> Investigation 1, Parts 1-3</p> <p><b>Living Systems</b> Investigation 2, Part 1</p> <p><b>Electronics</b> Investigation 2, Part 3</p> <p><b>Weather and Water</b> Investigation 4, Part 1</p>

necessary to judge the quality and validity of the proposed explanation. Critical analysis skills learned in the classroom can be applied to judge the validity of claims made in everyday life.

### **Science, Technology and Society**

1. Social, cultural, environmental, scientific and technological strengths and economic factors influence which scientific and technological areas are pursued and invested in. At the same time, the scientific discoveries made and technologies developed directly influence society and its habits, organization, and cultural values.
2. The issues surrounding science, technology, and society are complex and involve many risk/benefits considerations. Even though new technology may provide a solution to an important problem, its impact on human health, the environment, and social dynamics needs to be analyzed.

### **History and Context of Science**

1. Over the course of human history, science has been practiced by different people in different cultures. Unfortunately, women and minorities have often been discouraged or denied the opportunity of participating in science because of education and employment prejudices or restrictions.
2. People engaged in doing science are found in many occupations and institutions such as hospitals, universities, classrooms, industry, and farms. The nature of scientific investigation often requires that teams of individuals with different abilities work together to solve a problem or to understand the natural world.

### **Solar Energy**

Science Stories, pgs 22-24, 26-32

**Environments** Science Stories, pgs 39-41

**Earth History** Resources, pgs 64-67

### **Planetary Science**

Resources, pgs 74-82, 90-95

### **Landforms**

Science Stories, pgs 13-14

**Environments** Science Stories, pgs 39-41

**Earth History** Resources, pgs 64-67

### **Weather and Water**

Resources, pgs 63-65

**Solar Energy** Science Stories, pg 25

### **Mixtures and Solutions**

Science Stories, pgs 5, 10, 22-25, 27, 29, 30

### **Water Planet**

Science Resources, pgs 15, 18-19

### **Populations and Ecosystems**

Resources, pgs 46-52, 60-61

### **Planetary Science**

Resources, pgs 52-53

### **Chemical Interactions**

Resources, pgs 5, 7-8, 69-72, 81-83

### **Models and Designs**

FOSS Web, Careers

**Landforms** Science Stories, pgs 13-14

**Earth History** Resources, pgs 98-99

### **Weather and Water**

Video, Water Works; Careers in Hydrology

### **Chemical Interactions**

Resources, pp. 81-83

## Standard Two Materials and Their Properties

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Properties and Structure of Matter</b></p> <ol style="list-style-type: none"> <li>Elements are substances that cannot be decomposed into simple materials by chemical reaction. However, elements can react with other elements or materials to form compounds. There are more than 100 known elements which combine in a multitude of ways to produce compounds, which account for all living and nonliving substances.</li> <li>The three states or phases of matter (solid, liquid, gas) are determined by the arrangement, motion, and interaction of molecules. In the solid state, molecules are packed tightly together and their movement is restricted to vibrations. In the liquid state, molecules are more loosely packed and can slide past each other. In the gaseous state, molecules are less restricted and move freely. Changes in state require the addition or removal of heat but result in no change in the chemical structure of the material. Changes in either the temperature, pressure, or volume of a gas result in predictable changes in the other properties.</li> <li>Some physical properties such as mass and volume depend upon the amount of material; others such as density and melting point, known as characteristic properties, are independent of the quantity and unique to the material.</li> </ol>	<p><b>Mixtures and Solutions</b> Investigation 4, Parts 1-3 Science Stories, pgs 3-6, 21-22, 26-30</p> <p><b>Chemical Interactions</b> Investigation 2, Parts 1-2 Science Resources, pgs 3-6, 9-15, 90-95</p> <p><b>Mixtures and Solutions</b> Investigation 1, Parts 2, 3 Investigation 4, Parts 1-3</p> <p><b>Solar Energy</b> Investigation 2, Part 2</p> <p><b>Weather and Water</b> Investigation 5, Parts 2, 3 CD, Matter and Energy: Molecules in Solids, Liquids, and Gases</p> <p><b>Chemical Interactions</b> Investigation 4, Parts 1-3 Investigation 6, Part 1 Investigation 7, Parts 1-5 Resources, pgs 16-27, 32-48</p> <p><b>Weather and Water</b> Investigation 5, Part 1 Resources, pgs 27-31</p> <p><b>Chemical Interactions</b> Investigation 6, Part 1 Investigation 7, Part 2 Resources, pg 47</p>

<p style="text-align: center;"><b>Mixtures and Solutions</b></p> <ol style="list-style-type: none"> <li>1. Mixtures have component parts. Most natural materials such as milk, blood, mineral ores, sea water, soil, and air; and man-made materials, such as processed foods, cosmetics, and paints are physical mixtures consisting of a variety of components in a wide range of concentrations. The individual components can be analyzed and separated by making use of their unique chemical and physical properties.</li> <li>2. Solutions are homogenous mixtures of two or more components. The properties of a solution depend on the nature and concentration of the solute(s) (the material being dissolved) and the nature of the solvent(s) (the medium in which the solutes are dissolved).</li> </ol>	<p><b>Mixtures and Solutions</b> Investigation 1, Parts 1-4 FOSS Web, Activity: Solution or Mixture <b>Chemical Interactions</b> Investigation 8, Part 1</p> <p><b>Mixtures and Solutions</b> Investigation 2, Parts 1-4 Investigation 3, Parts 1-3 FOSS Web, Activity: Solution or Mixture <b>Chemical Interactions</b> Investigation 8, Parts 1-3 Resources, pgs 49-53</p>
<p><b>Transformation and Conservation of Matter</b></p> <ol style="list-style-type: none"> <li>1. Substances react chemically in characteristic ways with other substances to form new substances. In all chemical reactions the total mass is conserved. Substances can be categorized and grouped based on similarity in reactivity, for example metals.</li> </ol>	<p><b>Mixtures and Solutions</b> Investigation 4, Parts 1-4 Science Stories, pgs 21-22 FOSS Web, Movie: Physical and Chemical Change <b>Chemical Interactions</b> Investigation 9, Parts 1-4 Investigation 10, Parts 1-2 Resources, pgs 6, 63-67, 90-91</p>
<p style="text-align: center;"><b>Material Technology</b></p> <ol style="list-style-type: none"> <li>1. Societies use the understanding of physical and chemical change to create new and useful products. The production of these materials has social, environmental, and other implications that require analyses of risks and benefits.</li> </ol>	<p><b>Mixtures and Solutions</b> Science Stories, pgs 31-33 <b>Food and Nutrition</b> Science Stories, pgs 13, 21 <b>Electronics</b> Resources, pgs 18-21 <b>Chemical Interactions</b> Resources, pg 73</p>

## Standard Three Energy and Its Effects

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Forms/Sources of Energy</b>	
<p>1. The electromagnetic spectrum is composed of different wavelength domains. The radiation in this spectrum comes from various sources and spans energy levels from radio waves (longest wavelengths, lowest energy) through microwaves, infrared, visible, ultraviolet, x-rays, to gamma rays (shortest wavelengths, highest energy). White light from the sun consists of a mixture of wavelengths and energies in the visible part of the electromagnetic spectrum (red to violet).</p> <p>2. Electrical energy results from the movement of electric charges (electrons) driven by voltage through a complete circuit. Electrical energy can be readily generated, transmitted over great distances, and transformed into heat, light, sound, and motion. Electrical systems can be designed to perform a variety of tasks, using series, parallel, or combination circuits.</p> <p>3. Static electricity represents potential energy stored in a collection of separated negative and positive charges. Similar charges repel each other; opposite charges attract each other and can lead to a sudden flow of electrons (e.g., a spark, a lightning bolt).</p> <p>4. Chemical energy is stored in elements and compounds. In most chemical reactions, energy is released or added to the system in the form of heat, light, electrical, or mechanical energy.</p>	<p><b>Solar Energy</b> Science Stories, pgs 4-5  <b>Variables</b> Science Stories, pgs 4-5  <b>Planetary Science</b> Resources, pg 99</p> <p><b>Models and Designs</b>            Investigation 2, Parts 1-3  <b>Electronics</b>            Investigation 1, Parts 1-5            Investigation 4, Parts 1, 2            Resources, pgs 9-14</p> <p><b>Electronics</b> Resources, pg 12            CD, Tech Manual: Static Electricity</p> <p><b>Living Systems</b> Investigation 3, Parts 1-2            Science Resources, pgs 31-35  <b>Populations and Ecosystems</b>            Investigation 5, Part 1            Resources, pgs 14-16  <b>Chemical Interactions</b>            Resources, pgs 76-77</p>

<p style="text-align: center;"><b>Force and Motion</b></p> <ol style="list-style-type: none"> <li>Force must be used to change speed or direction (or both) of a moving object. In the absence of such a force, the object will continue to move with the same speed and in the same direction and magnitudes that can be measured. Any change in motion depends upon the amount of force causing the change and the mass of the object.</li> <li>Mechanical energy comes from the motion and/or the position of physical objects. The work done on an object depends on the applied force and on the distance that the object moves.</li> <li>The motion of an object can be described as its change in position, direction, and speed relative to another object.</li> <li>Simple machines (e.g., levers, incline planes, pulleys, gears) are used to change the force on an object and its speed or direction in order to make work easier.</li> </ol>	<p><b>Force and Motion</b>, Investigation 1, Parts 1-3  <b>Levers and Pulleys</b> Investigation 3, Parts 1-3  <b>Variables</b> Investigation 1, Parts 1-3  Investigation 3, Parts 1-3  <b>Water Planet</b> Investigation 1, Part 2  Science Resources, pgs 16-17  <b>Models and Designs</b>  Investigation 3, Parts 1, 2  Science Stories, pp 48-55</p> <p><b>Force and Motion</b>, Investigation 4, Parts 1-3  <b>Levers and Pulleys</b> Investigation 3, Parts 1-3  <b>Variables</b> Investigation 3, Parts 1-3  Investigation 4, Parts 1-3  <b>Models and Designs</b>  Investigation 4, Parts 1, 2</p> <p><b>Force and Motion</b>, Investigation 1, Parts 1-3  <b>Levers and Pulleys</b> Investigation 3, Parts 1-3  <b>Variables</b> Investigation 3, Parts 1-3  <b>Models and Designs</b>  Investigation 3, Parts 1, 2  Investigation 4, Parts 1, 2  <b>Water Planet</b> Investigation 1, Part 2  Science Resources, pgs 16-17</p> <p><b>Levers and Pulleys</b> Investigation 1, Parts 1-3  Investigation 3, Parts 1-3  Investigation 4, Parts 1, 2  Science Stories, pgs 1-32  <b>Models and Designs</b>  Investigation 3, Part 1</p>
<p style="text-align: center;"><b>Transformations and Conservation of Energy</b></p> <ol style="list-style-type: none"> <li>Almost all events in the Universe involve the transformation of one form of energy into another form with the release of heat. Regardless of the transformation, the total amount of energy remains constant.</li> </ol>	<p><b>Solar Energy</b> Investigation 2, Parts 1, 2  Investigation 3, Parts 1, 2  Science Stories, pgs 27-32  <b>Variables</b> Investigation 3, parts 1-3  <b>Weather and Water</b>  Investigation 5, Parts 2, 3  Resources, pgs 20-26  CD, Matter and Energy: Heat and Energy</p>
<ol style="list-style-type: none"> <li>Heat energy is transported through materials by conduction, by convection in fluids (e.g., air or water), or across space by radiation. The addition or removal of heat from a material changes its temperature or its physical</li> </ol>	<p><b>Solar Energy</b> Investigation 2, Parts 1, 2  Investigation 3, Parts 1, 2  Science Stories, pgs 18-19  <b>Water Planet</b> Investigation 3, Parts 1-2  Science Resources, pgs 42-44, 48-51  <b>Weather and Water</b></p>

<p>state (e.g., ice melting).</p> <p><b>Interactions of Energy With Materials</b></p> <ol style="list-style-type: none"> <li>1. Energy can travel as waves which are characterized by wavelength, frequency, amplitude, and speed. Waves have common properties of absorption, reflection, and refraction when they interact with matter. They are either mechanical (e.g., sound, earthquake, tidal) or electromagnetic (e.g., sunlight, radio waves); only electromagnetic waves will travel through a vacuum.</li> <li>2. The resistance to flow of an electric current through a material depends on the mobility of electrons in the material. In conductors (e.g., metals) the electrons flow easily, while in insulators (e.g., wood, glasses) they flow hardly at all. The resistance to flow converts electric energy to heat energy.</li> </ol> <p><b>Production/Consumption/Application of Energy</b></p> <ol style="list-style-type: none"> <li>1. Technological advances throughout history (e.g., electric light, steam engine, internal combustion engine, radio, TV) have led to new applications which use different forms of energy. Such advances have led to increased demand for energy, and in some cases, unanticipated effects on society.</li> <li>2. Energy is obtained from a variety of sources, some of which are finite and some of which are renewable. The major source of energy for society is chemical energy stored in fossil fuels created many years ago through the process of photosynthesis. Another source is nuclear energy. Renewable sources (wind, geothermal, waves, biomass) vary in their availability and ease of use.</li> <li>3. Most energy used by industrial</li> </ol>	<p>Investigation 4, Parts 1, 2 Investigation 5, Parts 2, 3 Resources, pgs 22-26 CD, Video: Conduction Through Metals</p> <p><b>Chemical Interactions</b> Investigation 4, Parts 1-3 Resources, pgs 24-27, 38-41, 43-48</p> <p><b>Solar Energy</b> Science Stories, pgs 4-5 <b>Planetary Science</b> Resources, pg 99</p> <p><b>Electronics</b> Investigation 2, Parts 1-4 Resources, pgs 6-8</p> <p><b>Solar Energy</b> Science Stories, pgs 22-32 <b>Models and Designs</b> Science Stories, pgs 25-27, 37-40 <b>Electronics</b> Resources, pgs 22-25, 34-36</p> <p><b>Solar Energy</b> Science Stories, pgs 2-3, 22-32 <b>Electronics</b> Resources, pgs 12-13</p> <p><b>Solar Energy</b></p>
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<p>societies is derived from fossil fuels sources. Such sources are inherently limited on the earth and are unevenly distributed geographically, Responsible use of energy requires consideration of energy availability, efficiency, environmental issues, and alternative sources.</p>	<p>FOSS Web, Activity: Match the Resource</p>
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## Standard Four Earth in Space

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Solar System Models</b>	
<p>1. The Universe is composed of billions of stars. The Sun is a medium size star which is many millions of miles closer to Earth than the next nearest star.</p> <p>2. The Solar System forms part of the Milky Way Galaxy, which is one of many galaxies that comprise the Universe. Some of the galaxies are so far away that their light takes billions of years to reach Earth.</p> <p>3. The nine planets, their respective Moons), comets and many asteroids, and meteorites orbit the Sun which is the gravitational center of the Solar System.</p> <p>4. The apparent shape of the Moon changes dramatically as it moves in its orbit. The shapes, called phases, relate to lunar visibility and the times at which the Moon rises and sets. The Moon produces no light of its own and shines only as a result of sunlight reflected from its surface.</p>	<p><b>Water Planet</b> Science Resources, pgs 2-3 <b>Solar Energy</b> Science Stories, pg 1 <b>Planetary Science</b> Resources, pgs 84-85, 100 CD, Notebooks: Sun</p> <p><b>Planetary Science</b> Resources, pg 100</p> <p><b>Water Planet</b> Investigation 1, Part 1 Science Resources, pgs 1-13, 20-21 <b>Models and Designs</b> Science Stories, pgs 6-7 <b>Planetary Science</b> Investigation 10, Parts 1-3 Resources, pgs 84-89, 101-103 CD, Notebooks: Solar System</p> <p><b>Planetary Science</b> Investigation 4, Part 1 Investigation 9, Parts 1-4 Resources, pg 32 CD, Lunar Calendar; Phases of the Moon</p>
<p>5. The yearly revolution of Earth in its orbit about the Sun and the tilt of Earth on its axis (23.5 degrees) cause the angle at which sunlight strikes the Earth to vary at different locations. This causes differences in the heating of Earth's surface which produce seasonal variations in weather and a variety of climates.</p> <p style="text-align: center;"><b>Interactions in the Solar System</b></p> <p>1. Nuclear processes that take place in the Sun continuously convert matter to</p>	<p><b>Weather and Water</b> Investigation 3, Parts 1-3 Resources, pgs 17-19 CD, Cycles: Seasons</p> <p><b>Solar Energy</b> Science Stories, pg 4 <b>Water Planet</b></p>

<p>energy. A small portion of this energy which is intercepted by Earth drives biological, chemical, and physical processes on Earth.</p> <p>2. The gravitational attraction that exists between all forms of matter holds objects on earth, causes tides, keeps the Solar System and galaxy together, and controls the movement of the planets in the Solar System.</p> <p><b>Technology and Applications</b></p> <p>1. Close-up pictures and data received from space probes allow scientists to compare the physical properties of planets (e.g., size, surface features, number of rings) and to speculate about conditions on other planets.</p>	<p>Science Resources, pgs 3, 20  <b>Planetary Science</b> Resources, pgs 84-85  CD, Notebooks: Sun</p> <p><b>Water Planet</b> Investigation 1, Part 2  Science Resources, pgs 16-17  <b>Planetary Science</b> Resources, pgs 70, 84-85</p> <p><b>Water Planet</b>  Science Resources, pgs 4-10  <b>Planetary Science</b> Resources, pgs 90-95  CD, Notebooks: Space Exploration</p>
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## Standard Five Earth's Dynamic Systems

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<b>Components of Earth</b>	
<p>1. Rocks and minerals are classified according to their chemical and physical properties. Rocks also are classified according to how they were formed.</p> <p>2. Sedimentary rocks, which are made of particles from other rocks and organic remains, are laid down in horizontal layers. Fossilized remains and successive layering of sedimentary rocks provide evidence of the Earth's history. Absolute age is determined by radioactive dating.</p> <p>3. The atmosphere has properties that can be observed, measured, and used to predict changes in weather and to identify climatic patterns.</p> <p>4. Water falling to Earth flows over the surface as run-off and collects in ocean basins, rivers, lakes, ice caps, and underground. Water stored underground (sub-surface) and water stored above ground (surface) form a continuum, each supplying water to the other. Human activity and natural events can introduce chemicals affecting the quality of the water supply.</p>	<p><b>Earth History</b> Investigation 8, Parts 1, 3 Resources, pgs 93-97 CD, Geology Lab: Formation of Metamorphic, Sedimentary and Igneous Rocks CD, Rock Database</p> <p><b>Earth History</b> Investigation 5, Part 4 Investigation 7, Parts 1, 2 Resources, pgs 73-88 CD, Geology Lab: Fossilization Process</p> <p><b>Water Planet</b> Investigation 3, Part 3 Investigation 4, Part 3 Science Resources, pgs 33-40, 46-50, 52-57</p> <p><b>Weather and Water</b> Investigation 2, Parts 1, 2 Resources, pgs 5-11, 37-42 CD, Atmospheric Data: Elevator to Space</p> <p><b>Landforms</b> Science Stories, pgs 15-17, 30-34</p> <p><b>Water Planet</b> Investigation 4, Part 4 Science Resources, pgs 64-70</p> <p><b>Weather and Water</b> Investigation 7, Parts 1, 2 Resources, pgs 45-47 CD, Cycles: Water Cycle</p>
<b>Interactions Among Earth Systems</b>	
<p>1. Volcanoes, earthquakes, and other mountain-building processes are responsible for most major features of the Earth's crust.</p>	<p><b>Landforms</b> Science Stories, pgs 27-30 <b>Earth History</b> Resources, pgs 100-105 CD, Earth processes: Volcanoes; Faulting and Folding</p>
<p>2. Rocks are changed by erosion and deposition and by exposure to heat and pressure. There are a variety of</p>	<p><b>Landforms</b> Investigation 2, Parts 1, 2 Investigation 3, Parts 1-3 <b>Earth History</b></p>

<p>physical and chemical processes that lead to the decomposition and breakdown of rocks and the eventual formation of soils and sediments. These soils and sediments can then be transported to other places by wind, flowing water, waves, and ice.</p> <p>3. The cycling of water in the atmosphere is driven by energy transfer processes, such as convection and radiation, and is constantly changing the location and phase of water.</p> <p>4. Uneven heating and cooling of Earth's surface produce various air masses which differ in density, humidity, and temperature. The origin, movement, and interaction of these air masses result in significant weather changes.</p> <p>5. Ocean currents affect the weather and long term climatic patterns of a region. Large bodies of water (oceans, the Great Lakes, inland seas) can also affect the weather and climate of an area.</p> <p><b>Technology and Applications</b></p> <p>1. Instrumentation (e.g., pH meters, water analysis kits) and computer models enable the measure and analysis of environmental pollution. Sources of environmental pollution can be tracked using maps and satellite imagery.</p>	<p>Investigation 4, Parts 3, 4 Resources, pgs 93-97 CD, Earth Processes: Stream Tables CD, Video: Weathering and Erosion</p> <p><b>Solar Energy</b> Science Stories, pgs 18-19 <b>Water Planet</b> Investigation 4, Part 1 Science Resources, pgs 67-70 <b>Weather and Water</b> Investigation 5, Parts 2, 3 Investigation 7, Parts 1, 2 CD, Cycles: Water Cycle CD, Matter and Energy: Heat and Energy</p> <p><b>Solar Energy</b> Science Stories, pgs 18-21 FOSS Web, Movie: How Weather Occurs <b>Water Planet</b> Science Resources, pgs 42-50 <b>Weather and Water</b> Investigation 8, Part 2 Investigation 9, Parts 1, 2 Resources, pgs 84-86 CD, Climatic Factors: Local Wind</p> <p><b>Water Planet</b> Science Resources, pgs 76-77, 79 <b>Weather and Water</b> Investigation 8, Part 2 CD, Climatic Factors: Weather and Landforms; Local Wind</p>
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## Standard Six Life Processes

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Structure/function Relationship</b></p> <ol style="list-style-type: none"> <li>The basic unit of all living organisms is the cell. In multi-cellular organisms, different cells are specialized to perform various tasks, and cells similar in shape and function are organized into groups (e.g., muscle cells, motor nerve cells).</li> <li>Cells contain a set of observable structures called organelles (e.g., cell wall, cell membrane, nucleus, chloroplast, and vacuole) that control the various functions of the cell such as structural support, exchange of materials, photosynthesis, and storage of essential materials.</li> <li>Unicellular organisms perform, within a single cell, all of life's specific functions such as water regulation, digestion, locomotion, and circulation using specialized structures for each function.</li> </ol> <p style="text-align: center;"><b>Matter and Energy Transformations</b></p> <ol style="list-style-type: none"> <li>Plants make their food by the process of photosynthesis. Using light energy, green plants convert water and carbon dioxide into energy-rich simple sugars and oxygen. Sugar is the source of food used by most plants, and ultimately, by all other consumers. Oxygen produced during photosynthesis is required for the survival of most plants and animals.</li> <li>All living things obtain energy from food. Energy is needed for living things cells to carry out the processes of life such as growing, disposing of wastes, making new cells, and using food.</li> </ol>	<p><b>Living Systems</b> Investigation 1, Part 1 Science Resources, pgs 1-5, 11</p> <p><b>Diversity of Life</b> Investigation 4, Parts 1, 2 Resources, pgs 27-30, 32, 37-38 CD, Lab: Cells and the Ribbon of Life</p> <p><b>Diversity of Life</b> Investigation 4, Parts 1, 2 Resources, pgs 27-30 CD, Lab: Cells and the Ribbon of Life</p> <p><b>Diversity of Life</b> Investigation 3, Parts 1-3 Resources, pgs 24-26 CD, Database Collection: Paramecium, Amoeba, Euglena</p> <p><b>Living Systems</b> Investigation 3, Parts 1-2 Science Resources, pgs 31-35, 47-48</p> <p><b>Diversity of Life</b> Resources, pgs 35-39</p> <p><b>Populations and Ecosystems</b> Investigation 5, Part 2 Resources, pgs 14-15</p> <p><b>Living Systems</b> Investigation 3, Part 2 Science Resources, pgs 35-36, 47-48</p> <p><b>Food and Nutrition</b> Science Stories, pgs 2-5, 14-15, 27-29</p> <p><b>Populations and Ecosystems</b> Investigation 5, Parts 1-4 Resources, pgs 14-21</p> <p><b>Diversity of Life</b> Resources, pgs 36-37</p>

<p style="text-align: center;"><b>Regulation and Behavior</b></p> <ol style="list-style-type: none"> <li>1. All organisms obtain and use resources to grow, reproduce, and maintain a relatively stable environment while living in a constantly changing external environment. Regulation of an organism's internal environment involves sensing external changes in the environment and changing physiological activities to keep within the range required to survive.</li> <li>2. Behavior is one kind of response an organism makes to environmental stimuli. Behavioral responses require coordination and communication at many levels including cells, organ systems, and whole organism.</li> </ol> <p style="text-align: center;"><b>Health and Technology Applications</b></p> <ol style="list-style-type: none"> <li>1. The functioning and health of organisms, including humans, are influenced by heredity, diet, lifestyle, bacteria, viruses, parasites, and the environment. Certain body structures and systems function to protect against disease and injury.</li> <li>2. Sanitation measures such as the use of sewers, landfills, quarantines, and safe food handling are important in controlling the spread of organisms that cause disease.</li> </ol>	<p><b>Environments</b> Investigation 2, Parts 2, 3 Investigation 6, Parts 1, 2 Science Stories, pgs 9-17 <b>Diversity of Life</b> Investigation 6, Part 2 Resources, pgs, 37-39 <b>Human Brain and Senses</b> Investigation 2, Part 1 CD, Vision: How the Eye Works</p> <p><b>Environments</b> Investigation 2, Parts 2, 3 Investigation 6, Parts 1, 2 <b>Diversity of Life</b> Investigation 8, Part 2 Resources, pgs, 60-64 <b>Human Brain and Senses</b> Investigation 7, Parts 1, 2 Resources, pgs 57-58 CD, Touch: How the Skin Works</p> <p><b>Food and Nutrition</b> Science Stories, pgs, 1-4, 16-19, 22-25 <b>Living Systems</b> Science Resources, pg 43 <b>Diversity of Life</b> Resources, pgs 68-69 <b>Human Brain and Senses</b> Resources, pgs 67-68</p>
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## Standard Seven Diversity and Continuity of Living Things

By the end of the eighth grade students should know that:

<i>CONTENT STATEMENT</i>	<i>FOSS</i>
<p style="text-align: center;"><b>Heredity</b></p> <p>1. Chromosomes, which are components of cells, occur in pairs and carry hereditary information. The subunits of chromosomes are genes which direct the formation of an organism's traits.</p> <p style="text-align: center;"><b>Reproduction and Development</b></p> <p>1. In asexual reproduction, a new organism grows from a single cell or a cluster of cells provided by the parent and results in an offspring genetically identical to the parent.</p> <p>2. In sexual reproduction, gametes (egg and sperm), which are produced in specialized structures of the parents, fuse during fertilization to form an organism. Since each gamete contributes a set of chromosomes, the offspring have traits of both parents.</p> <p>3. After the egg is fertilized, it undergoes an orderly series of changes involving cell division and differentiation as a new organism is formed. Each of the new cells in the developing organism receives an exact copy of the genetic information contained in the fertilized egg.</p>	<p><b>Populations and Ecosystems</b> Investigation 9, Part 2 Resources, pgs 46-55</p> <p><b>Diversity of Life</b> Resources, pg 26</p> <p><b>Diversity of Life</b> Investigation 7, Part 1 Resources, pg 41 Populations and Ecosystems Resources, pgs 50, 52-54</p>
<p style="text-align: center;"><b>Evolution</b></p> <p>1. Natural Selection is the process by which some individuals with certain traits are more likely to survive and produce greater numbers of offspring than other organisms of the same species. Conditions in the environment can affect which individuals survive in order to reproduce and pass their traits on to future generations. Small differences between parents and offspring accumulate over many generations and ultimately new species may arise.</p> <p>2. Anatomical comparisons and fossils</p>	<p><b>Populations and Ecosystems</b> Investigation 10, Parts 1-3 Resources, pgs 58-61 CD. Video: Voyage to the Galapagos</p> <p><b>Earth History</b> Investigation 6, Parts 2, 3</p>

<p>provide evidence for evolution and indicate that the first organisms originated on the Earth between three and four billion years ago. The Earth's present day species evolved from earlier, distinctly different species.</p> <p style="text-align: center;"><b>Diversity</b></p> <ol style="list-style-type: none"> <li>1. Organisms are currently classified into five kingdoms (monera, protista, fungi, plantal, animalia) based on similarities in structure and behavior.</li> <li>2. A species is an important biological grouping of organisms whose members have similar structures, normally interbreed, and produce fertile offspring.</li> <li>3. Each structure in an organism is uniquely adapted to perform a particular function for enhancing the ability of the organism to survive. The great variety of body forms found in different species enable organisms to survive in diverse environments.</li> </ol>	<p>Investigation 7, Parts 1, 2 Resources, pgs 76-87 CD, Time Room; Time Machine</p> <p><b>Diversity of Life</b> Resources, pgs 65-69</p> <p><b>Populations and Ecosystems</b> Resources, pg 5</p> <p><b>Environments</b> Science Stories, pgs 1-17 <b>Diversity of Life</b> Investigation 7, Parts 1, 2 Resources, pgs 32, 34, 36, 38-39, 46-50 <b>Populations and Ecosystems</b> Investigation 8, Parts 1, 2 Resources, pgs 42-45 Video, Hawaii: Strangers in Paradise</p>
<p><b>Health and Technology Applications</b></p> <ol style="list-style-type: none"> <li>1. Selective breeding is used to produce new varieties of cultivated plants and domesticated animals with enhanced traits.</li> <li>2. Knowledge gained from research in genetics is being applied to areas of human health.</li> </ol>	<p><b>Environments</b> Science Stories, pgs 43-44 <b>Populations and Ecosystems</b> Resources, pgs 58-59</p> <p><b>Populations and Ecosystems</b> Resources, pgs 54-55</p>

## Standard Eight Ecology

By the end of the eighth grade students should know that:

CONTENT STATEMENT	FOSS
<p style="text-align: center;"><b>Interactions Within the Environment</b></p> <ol style="list-style-type: none"> <li>1. An ecosystem consists of all the organisms that live together and interact with each other and their physical environment.</li> <li>2. Interactions in an ecosystem result from the transfer of matter and energy from producers to consumers and eventually to decomposers. The total amount of matter and energy in the system remains the same even though its form and location changes.</li> <li>3. Matter is recycled in an ecosystem, and energy which enters the system as sunlight is either stored in the bodies of organisms, used by consumers to support their activities, or dissipated to the environment as heat energy. Loss of heat from an ecosystem is compensated for by continuous input of solar energy.</li> </ol>	<p><b>Populations and Ecosystems</b> Investigation 2, Parts 1 Investigation 3, Parts 1-3 Investigation 7 Resources, pgs 42-45</p> <p><b>Populations and Ecosystems</b> Investigation 5, Parts 1-4 Resources, pgs 17, 25-41 CD: Ecoscenarios</p> <p><b>Populations and Ecosystems</b> Resources, pgs 17-21</p>
<p style="text-align: center;"><b>Change in Ecosystems</b></p> <ol style="list-style-type: none"> <li>1. Changes in the physical or biological conditions of an ecosystem can alter the diversity of species in the system. As the ecosystem changes, populations or organisms must adapt to these changes, move to another ecosystem, or become extinct.</li> <li>2. The size of populations in an ecosystem may increase or decrease as a result of the interrelationships among organisms, availability of resources, natural disasters, habitat changes, and pollution.</li> </ol>	<p><b>Environments</b> Science Stories, pgs 39-41 <b>Populations and Ecosystems</b> Investigation 7 Resources, pgs 25-29, 31-41</p> <p><b>Environments</b> Science Stories, pgs 39-41 <b>Populations and Ecosystems</b> Investigation 6, Part 3 Resources, pgs 22-29</p>
<p style="text-align: center;"><b>Technology and Its Influence on the Environment</b></p> <ol style="list-style-type: none"> <li>1. Agriculture relies heavily on technology to increase productivity. Advances in irrigation allow crops to grow in areas</li> </ol>	

<p>where there is not enough precipitation. Chemicals are used to fertilize crops and to control damage done by rodents, fungi, insects, and weeds. The need to increase agricultural production results in environmental trade-offs (e.g., saltwater intrusion, water table lowering, agricultural runoff into rivers/streams, elimination of beneficial insects, desertification).</p> <p style="text-align: center;"><b>Interaction of Humans Within Ecosystems</b></p> <p>1. The extinction or introduction of species can affect the stability of ecosystems. With careful planning, humans may be able to sustain ecosystems for their use as well as preserve their biodiversity and natural beauty.</p>	<p><b>Populations and Ecosystems</b> Investigation 7 Resources, pgs 31-41, 61</p>
<p>2. Decisions about the use of natural resources are often determined by a society's short-term needs for the resources with little regard for long-term consequences. The supply of natural resources such as water and petroleum is finite. Non-material resources (e.g., tranquility, beautiful scenery) cannot be easily quantified but must be preserved.</p>	<p><b>Landforms</b> Science Stories, pgs 13-14 <b>Environments</b> Science Stories, pgs 39-42 <b>Water Planet</b> Investigation 4, Part 4 Science Resources, pg 66 <b>Earth History</b> Resources, pgs 64-67 <b>Populations and Ecosystems</b> Resources, pgs 25-29</p>