



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

Correlation With

**Montana  
Science Content Standards  
and Benchmarks**



# State of Montana Science Content Standards

## Correlated to FOSS™ Modules (Full Option Science System)

The following is a correlation of the Montana Science Content Standards to the Full Option Science System (FOSS) Modules. This correlation shows representative examples of investigations and activities from the FOSS program that address the Benchmarks at two points: at the end of grade 4, encompassing all grades K-4 FOSS modules, and at the end of grade 8, encompassing grades 5-6 kits from the K-6 FOSS modules and the FOSS Middle School modules designed for Grades 6-8. A citation does not reflect all of the investigations or activities from FOSS that might address a particular standard.

# End of Grade Four Benchmarks Kindergarten

## **Science Content Standard 1**

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will develop the abilities necessary to safely conduct scientific inquiry, including (a step-by-step sequence is not implied): (a) asking questions about objects, events, and organisms in the environment, (b) planning and conducting simple investigations.	FOSS is an inquiry based program and provides ample opportunity to address this benchmark through its investigations. See examples below. <b>Animals Two by Two</b> Investigation 4 Part 1 <b>Fabric</b> Investigation 2 Part 1 <b>Trees</b> Investigation 1 Part 1 <b>Wood and Paper</b> Investigation 1 Part 4	Pages 8-11  Pages 7-11  Pages 7-14  Pages 24-27
2. Students will select and use appropriate tools including technology to make measurements (including metric units) and represent results of basic scientific investigations.	<b>Animals Two by Two</b> Investigation 2 Math Extension 5 Investigation 3 Math Extension 1 <b>Fabric</b> Investigation 1 Part 4 <b>Trees</b> Investigation 1 Math Extensions 1, 2 <b>Wood and Paper</b> Investigation 5 Part 1	Page 26 Page 21  Pages 20-22  Page 39  Pages 8-11
3. Students will use data to describe and communicate the results of scientific investigations.	<b>Animals Two by Two</b> Investigation 3 Math Extension 1 <b>Fabric</b> Investigation 1 Math Extension 3 <b>Trees</b> Investigation 3 Part 9 <b>Wood and Paper</b> Investigation 1 Part 5	Page 21  Page 35  Pages 35-38  Pages 28-32
4. Students will use models that illustrate simple concepts and compare those models to the actual phenomenon.	<b>Animals Two by Two</b> Investigation 1 Part 3 <b>Fabric</b> Investigation 2 Part 2 <b>Trees</b> Investigation 2 Parts 1-6 <b>Wood and Paper</b> Investigation 2 Part 3  [Note: This benchmark is addressed in the grade 3 essential learning expectations]	Pages 22-25  Pages 12-17  Pages 6-32  Pages 16-19
5. Students will identify a valid test in an investigation.	<b>Animals Two by Two</b> Investigation 4 Part 2 <b>Fabric</b> Investigation 2 Part 1 <b>Trees</b> Investigation 1 Part 4 <b>Wood and Paper</b> Investigation 1 Parts 4, 5  [Note: This benchmark is addressed in the grade 3 essential learning expectations]	Pages 12-15  Pages 7-11  Pages 23-24  Pages 24-32
6. Students will identify how	Though FOSS is a nation-wide curriculum, this	

observations of nature form an essential base of knowledge among the Montana American Indians.	standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and customs.	
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## **Science Content Standard 2**

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will create mixtures and separate them based on different physical properties (e.g., salt and sand, iron filings and soil, oil and water).	<b>Fabric</b> Investigation 1 Part 1 <b>Wood and Paper</b> Investigation 2 Part 2  <b>[Note: This benchmark is addressed in the grade 2 essential learning expectations]</b>	Pages 6-11  Pages 12-15
2. Students will examine, measure, describe, compare and classify objects in terms of common physical properties.	<b>Animals Two by Two</b> Investigation 2 Part 4 <b>Fabric</b> Investigation 2 Parts 1, 4 <i>Fabric FOSS Science Stories</i> <b>Trees</b> Investigation 2 Part 1 <b>Wood and Paper</b> Investigation 1 Parts 1-2	Pages 22-24  Pages 7-11, 22-25 Page 3  Pages 6-9  Pages 8-19
3. Students will identify the basic characteristics of light, heat, motion, magnetism, electricity and sound.	<b>Fabric</b> Investigation 1 Science Extension 3 (magnetism) <b>Trees</b> Weather Tool 1-3 (light, heat, motion)	Page 36  Pages 6-15
4. Students will model and explain that matter exists as solids, liquids, and gases and can change from one form to another.		
5. Students will identify that the position of an object can be described by its location relative to another object and its motions described, and measured by external forces action upon it.	<b>Trees</b> Weather Tool 6 <b>Animals Two by Two</b> Investigation 1 Part 3 <b>Wood and Paper</b> Investigation 1 Part 3  <b>[Note: This benchmark is addressed in the grade 3 essential learning expectations]</b>	Pages 22-24  Pages 22-25  Pages 20-23
6. Students will identify, build, and describe mechanical systems and the forces acting within those systems.	<b>Trees</b> Weather Tools 5-6  <b>[Note: This benchmark is addressed in the grades 2 and 4 essential learning expectations]</b>	Page 18-24
7. Students will observe, measure and manipulate forms of energy: sound, light, heat, electric, magnets	<b>Fabric</b> Investigation 1 Science Extension 3 (magnetism) <b>Trees</b> Weather Tool 1-3 (light, heat, motion)	Page 36  Pages 6-15

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will identify that plants and animals have structures and systems that serve different functions for growth, survival, and reproduction.	The FOSS life science modules provide ample opportunity to address this benchmark. See examples below. <b>Animals Two by Two</b> Investigation 1 Part 1 <i>Animals Two by Two FOSS Science Stories</i> <b>Trees</b> Investigation 1 Parts 1-6	Pages 10-16 P 5-6, 9-10, 17-18, 21  Pages 7-30
2. Students will identify, measure, and describe basic requirements of energy and nutritional needs for an organism.	<b>Animals Two by Two</b> throughout, such as Investigation 1 Part 2 <i>Animals Two by Two FOSS Science Stories</i> <b>Trees</b> Investigation 1 Part 2 Investigation 3, Part 2 "Food from Trees"  [Note: This benchmark is addressed in the grade 1 essential learning expectations]	Pages 17-21 Page 12  Pages 15-19 Pages 12-14
3. Students will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.	<b>Animals Two by Two</b> Investigation 5 Parts 1-2 Investigation 5 Science Extension  [Note: This benchmark is addressed in the grade 2 essential learning expectations]	Pages 10-19 Page 28
4. Students will explain cause and effect relationships between nonliving and living components within ecosystems; and explain individual response to the changes in the environment including identifying differences between inherited, instinctual, and learned behaviors.	<b>Animals Two by Two</b> Investigation 1 Part 3 <b>Trees</b> Investigation 3 Parts 3, 6, 9  [Note: This benchmark is addressed in the grade 4 essential learning expectations]	Pages 22-25  Pages 15-18, 26-28, 35-38
5. Students will create and use a classification system to group a variety of plants and animals according to their similarities and differences.	<b>Animals Two by Two</b> Investigation 1 Part 4 <i>Animals Two by Two FOSS Science Stories</i> <b>Trees</b> Investigation 2 Part 6	Pages 22-24 P 7, 11, 15, 19, 23, 24  Pages 26-28

### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will describe and give examples of Earth's changing features.	<b>Trees</b> Tools for Observing Weather Tool 3	Pages 14-15
2. Students will describe and measure the physical properties of Earth's basic materials (including soil, rocks, water and gases) and the resources they provide.	  [Note: This benchmark is addressed in the grade 2 essential learning expectations]	
3. Students will investigate fossils and make inferences		

about life the plants, animals, and the environment at that time.	<b>[Note:</b> This benchmark is addressed in the grade 2 essential learning expectations]	
4. Students will observe and describe the water cycle and the local weather and demonstrate how weather conditions are measured.	<b>Trees</b> Tools for Observing Weather Tools 1-6 <b>[Note:</b> This benchmark is addressed in the grade 1 essential learning expectations]	Pages 1-24
5. Students will identify seasons and explain the difference between weather and climate.	<b>Trees</b> Investigation 3 Parts 1-9 <i>Trees FOSS Science Stories</i> <b>[Note:</b> This benchmark is addressed in the grade 2 essential learning expectations]	Pages 10-38 Pages 14-23
6. Students will identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the Sun.	<b>[Note:</b> This benchmark is addressed in the grade 1 essential learning expectations]	
7. Students will identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes).	<b>[Note:</b> This benchmark is addressed in the grade 1 essential learning expectations]	

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe and discuss examples of how people use science and technology.	<b>Animals Two by Two</b> Investigation 3 Science Extension 4 <b>Fabric</b> Investigation 2 Part 4 <i>Fabric FOSS Science Stories</i> <b>Trees</b> Tools for Observing Weather Tools 1-6 <b>Wood and Paper</b> Investigation 2 Parts 3-4 <i>Wood and Paper FOSS Science Stories</i>	Page 23 Pages 22-25 Pages 12-13 Pages 1-24 Pages 16-23 Pages 13-18
2. Students will describe a scientific or technological innovation that impacts communities, cultures, and societies.	<b>Fabric</b> Investigation 2 Part 2 <i>Fabric FOSS Science Stories</i> <b>Wood and Paper</b> Investigation 2 Parts 3-4 Investigation 4 Part 1 <i>Wood and Paper FOSS Science Stories</i> <b>[Note:</b> This benchmark is addressed in the grade 3 essential learning expectations]	Pages 12-17 Pages 16-24 Pages 16-23 Pages 8-13 Pages 13-18
3. Students will simulate scientific collaboration by sharing and communicating ideas to identify and describe problems.	Students share and communicate findings and ideas throughout all FOSS investigations, both in the course of hands-on investigations and in the lesson wrap-up. This skill is explicitly written into all FOSS lesson plans. <b>Fabric</b> Investigation 2 Part 4 <b>Trees</b> Investigation 1 Part 1 <b>Wood and Paper</b>	Pages 22-25 Pages 7-14

	Investigation 2 Part 2  [ <b>Note:</b> This benchmark is addressed in the grade 4 essential learning expectations]	Pages 12-15
4. Students will use scientific knowledge to make inferences and propose solutions for simple environmental problems.	<b>Animals Two by Two</b> Investigation 3 Science Extension 4 <b>Trees</b> Investigation 1 Part 1 <b>Wood and Paper</b> Investigation 4 Part 1 <i>Wood and Paper FOSS Science Stories</i>  [ <b>Note:</b> This benchmark is addressed in the grade 1 essential learning expectations]	Page 23  Pages 7-14  Pages 8-13 Pages 19-23
5. Students will identify how the knowledge of science and technology influences the development of the Montana American cultures.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will easily make between science and technology studied in FOSS and local technology and cultures.	

### **Science Content Standard 6**

Students understand historical developments in science and technology.

<i>BENCHMARKS</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will give historical examples of scientific and technological contributions to communities, cultures and societies, including Montana American Indian examples.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations and end of module projects. It can also be addressed through connections that Montana teachers will easily make between history of science and technology examples studied in FOSS and local history, technology and cultures.  [ <b>Note:</b> This benchmark is addressed in the grade 3 essential learning expectations]	
2. Students will describe how scientific inquiry has produced much knowledge about the world and a variety of contributions toward understanding events and phenomenon within the universe.	<b>Wood and Paper</b> <i>FOSS Science Stories</i>	Pages 9-12
3. Students will describe science as a human endeavor and an ongoing process.	<b>Fabric</b> <i>FOSS Science Stories</i> <b>Wood and Paper</b> <i>FOSS Science Stories</i>	Pages 12-24 Pages 9-12

# End of Grade Four Benchmarks

## Grade One

### **Science Content Standard 1**

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will develop the abilities necessary to safely conduct scientific inquiry, including (a step-by-step sequence is not implied): (a) asking questions about objects, events, and organisms in the environment, (b) planning and conducting simple investigations.	FOSS is an inquiry based program and provides ample opportunity to address this benchmark through its investigations. See examples below. <b>Air and Weather</b> Inv. 3 Part 1, Science Ext. 1 (Student Projects) <b>Balance and Motion</b> Investigation 1 Science Ext. 7 (Student Projects) <b>New Plants</b> Investigation 1 Science Ext. 3 (Student Projects) <b>Pebbles, Sand, and Silt</b> Investigation 4 Part 3 <b>Solids and Liquids</b> Investigation 4 Part 3 <b>Plants and Animals</b> Investigation 1 Parts 1-3 <b>Insects and Plants</b> Investigation 3 Parts 1-3	Pages 8-11, 39 Page 32 Page 31 Pages 19-25 Pages 23-27 Pages 47-72 Pages 129-151
2. Students will select and use appropriate tools including technology to make measurements (including metric units) and represent results of basic scientific investigations.	<b>Air and Weather</b> Investigation 3 Part 2 <b>Balance and Motion</b> Investigation 3 Math Extension Problem A <b>Insects</b> Investigation 1 Science Extension 1 <b>New Plants</b> Investigation 2 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 2 Parts 1-2 <b>Solids and Liquids</b> Investigation 3 Part 2 <b>Insects and Plants</b> Investigation 2 Part 3	Pages 12-16 Page 27 Page 27 Pages 20-28 Pages 8-17 Pages 19-23 Pages 105-115
3. Students will use data to describe and communicate the results of scientific investigations.	<b>Air and Weather</b> Investigation 2 Science Extensions 2, 3, 4 <b>Balance and Motion</b> Investigation 3 Math Extension 2 <b>Insects</b> Investigation 5 Science Extension 2 <b>New Plants</b> Investigation 1 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 2 Math Extension Problem A <b>Solids and Liquids</b> Investigation 4 Math Extension Problem A <b>Insects and Plants</b> Investigation 3 Parts 1-3	Page 31 Page 27 Page 27 Pages 23-30 Page 30 Page 28 Pages 105-115
4. Students will use models that illustrate simple concepts and compare those models to the actual phenomenon.	<b>Air and Weather</b> Investigation 1 Part 6 <b>Balance and Motion</b> Investigation 3 Part 1 <b>Insects</b> Investigation 1 Part 2	Pages 34-38 Pages 6-12 Pages 16-21

	<p><b>New Plants</b> Investigation 2 Parts 1-2</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 4 Part 1</p> <p><b>Solids and Liquids</b> Investigation 1 Part 3</p> <p><b>Insects and Plants</b> Investigation 3 Parts 1-3</p> <p>[Note: This benchmark is addressed in the grade 2 essential learning expectations]</p>	<p>Pages 15-28</p> <p>Pages 8-14</p> <p>Pages 21-24</p> <p>Pages 71-75</p>
5. Students will identify a valid test in an investigation.	<p><b>Animals Two by Two</b> Investigation 4 Part 2</p> <p><b>Fabric</b> Investigation 2 Part 1</p> <p><b>Trees</b> Investigation 1 Part 4</p> <p><b>Wood and Paper</b> Investigation 1 Parts 4, 5</p> <p><b>Air and Weather</b> Investigation 1 Part 5</p> <p><b>Balance and Motion</b> Investigation 1 Part 3</p> <p><b>Insects</b> Investigation 1 Part 2</p> <p><b>New Plants</b> Investigation 2 Part 3</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 4 Part 3</p> <p><b>Solids and Liquids</b> Investigation 4 Part 3</p> <p><b>Plants and Animals</b> Investigation 1 Part 3</p> <p>[Note: This benchmark is addressed in the grade 3 essential learning expectations]</p>	<p>Pages 12-15</p> <p>Pages 7-11</p> <p>Pages 23-24</p> <p>Pages 24-32</p> <p>Pages 27-33</p> <p>Pages 19-23</p> <p>Pages 16-21</p> <p>Pages 15-19</p> <p>Pages 19-25</p> <p>Pages 23-27</p> <p>Pages 63-72</p>
6. Students will identify how observations of nature form an essential base of knowledge among the Montana American Indians.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and customs.	

## **Science Content Standard 2**

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will create mixtures and separate them based on different physical properties (e.g., salt and sand, iron filings and soil, oil and water).	<p><b>Pebbles, Sand, and Silt</b> Investigation 4 Part 1</p> <p><b>Solids and Liquids</b> Investigation 3 Part 2 <i>Solids and Liquids FOSS Science Stories</i></p> <p>[Note: This benchmark is addressed in the grade 2 essential learning expectations]</p>	<p>Pages 8-14</p> <p>Pages 14-18</p> <p>Pages 18-23</p>
2. Students will examine, measure, describe, compare and classify objects in terms of common physical properties.	<p><b>Pebbles, Sand, and Silt</b> Investigation 1 Parts 1-4 <i>Pebbles, Sand, and Silt FOSS Science Stories</i></p> <p><b>Solids and Liquids</b></p>	<p>Pages 8-25</p> <p>Pages 3-9</p>

	Investigation 1 Parts 1-2 <i>Solids and Liquids FOSS Science Stories</i>	Pages 8-20 Pages 8-13
3. Students will identify the basic characteristics of light, heat, motion, magnetism, electricity and sound.	<b>Air and Weather</b> Investigation 2 Part 2 (heat) Investigation 3 Parts 1-5 (motion) <i>Air and Weather FOSS Science Stories</i> <b>Balance and Motion</b> Investigation 2 Part 1 (motion) Investigation 2 Science Extension (magnetism) <i>Balance and Motion FOSS Science Stories</i> <b>New Plants</b> Investigation 1 Part 2 <b>Solids and Liquids</b> Investigation 3 Science Extension 1 (magnetism)	Pages 14-19 Pages 8-33 Page 21  Pages 8-13 Page 28 Pages 10-13, 18-35  Pages 13-22  Page 31
4. Students will model and explain that matter exists as solids, liquids, and gases and can change from one form to another.	<b>Air and Weather</b> Investigation 2 Science Extension 7 <i>Air and Weather FOSS Science Stories</i> <b>Solids and Liquids</b> Investigation 2 Science Extension 3 Investigation 4 Parts 1-3, Science Extension 1 <i>Solids and Liquids FOSS Science Stories</i>	Page 32 Pages 8-9, 12  Page 30 Pages 7-27, 29 Pages 3-7, 14-17
5. Students will identify that the position of an object can be described by its location relative to another object and its motions described, and measured by external forces action upon it.	<b>Balance and Motion</b> Investigation 1 Part 3 <i>Balance and Motion FOSS Science Stories</i>  [Note: This benchmark is addressed in the grade 3 essential learning expectations]	Pages 19-23 Pages 3-13, 18-21
6. Students will identify, build, and describe mechanical systems and the forces acting within those systems.	<b>Air and Weather</b> Investigation 3 Parts 3-4 <b>Balance and Motion</b> Investigation 2 Part 1  [Note: This benchmark is addressed in the grades 2 and 4 essential learning expectations]	Pages 17-27  Pages 8-13
7. Students will observe, measure and manipulate forms of energy: sound, light, heat, electric, magnets	<b>Air and Weather</b> Investigation 2 Part 2 (heat) Investigation 3 Parts 1-5 (motion) <i>Air and Weather FOSS Science Stories</i> <b>Balance and Motion</b> Investigation 2 Part 1 (motion) Investigation 2 Science Extension (magnetism) <i>Balance and Motion FOSS Science Stories</i> <b>New Plants</b> Investigation 1 Part 2 <b>Solids and Liquids</b> Investigation 3 Science Extension 1 (magnetism)	Pages 14-19 Pages 8-33 Page 21  Pages 8-13 Page 28 Pages 10-13, 18-35  Pages 13-22  Page 31

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will identify that plants and animals have structures and systems that serve different functions for growth, survival, and reproduction.	<b>Insects</b> Investigation 1 Part 2 <i>Insects FOSS Science Stories</i> <b>New Plants</b> Investigation 1 Part 2 <i>New Plants FOSS Science Stories</i> <b>Plants and Animals</b>	Pages 16-21 Pages 8-11, 12-15  Pages 13-22 Pages 40-43

	<p>Investigation 2 Parts 1-3  Investigation 4 Parts 1-2  <i>Plants and Animals FOSS Science Resources</i>  Video: How Plants Get Food  <b>Insects and Plants</b>  Investigation 1 Parts 1-3  Investigation 2 Part 3  <i>Insects and Plants FOSS Science Resources</i></p> <p><b>[Note: This benchmark is addressed in the grade 2 essential learning expectations]</b></p>	<p>Pages 87-108  Pages 151-165  Pages 4-7, 28-50</p> <p>Pages 52-75  Pages 105-115  Pages 15-18, 30-33</p>
<p>2. Students will identify, measure, and describe basic requirements of energy and nutritional needs for an organism.</p>	<p><b>Insects</b> throughout, such as  Investigation 3 Part 2  <b>New Plants</b>  Investigation 1 Parts 2-3  <i>New Plants FOSS Science Stories</i>  <i>Physics of Sound FOSS Science Stories</i>  <b>Plants and Animals</b>  Investigation 1 Part 1  Investigation 3 Parts 1-2  <i>Plants and Animals FOSS Science Resources</i>  <b>Insects and Plants</b>  Investigation 1 Part 1  Investigation 4 Part 2</p>	<p>Pages 12-20</p> <p>Pages 13-30  Pages 3-7  Pages 24-25</p> <p>Pages 47-57  Pages 120-134  Pages 3-7, 21-23</p> <p>Pages 52-61  Pages 170-174</p>
<p>3. Students will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.</p>	<p><b>Insects</b>  Investigation 3 Part 3  <i>Insects FOSS Science Stories</i>  <b>New Plants</b>  Investigation 1 Science Extension 1  <i>New Plants FOSS Science Stories</i>  <b>Insects and Plants</b>  Investigation 1-5 all parts  <i>Insects and Plants FOSS Science Resources</i></p> <p><b>[Note: This benchmark is addressed in the grade 2 essential learning expectations]</b></p>	<p>Pages 21-26  Pages 16-33</p> <p>Page 32  Pages 12-15</p> <p>Pages 37-55</p>
<p>4. Students will explain cause and effect relationships between nonliving and living components within ecosystems; and explain individual response to the changes in the environment including identifying differences between inherited, instinctual, and learned behaviors.</p>	<p><i>Insects FOSS Science Stories</i>  <i>Pebbles, Sand, and Silt FOSS Science Stories</i>  <b>New Plants</b>  Investigation 2 Science Extensions 2, 3, 4  <i>New Plants FOSS Science Stories</i>  <b>Plants and Animals</b>  Investigation 1 Science Extension  Investigation 3 Parts 1-2  <i>Plants and Animals FOSS Science Resources</i></p> <p><b>[Note: This benchmark is addressed in the grade 4 essential learning expectations]</b></p>	<p>Pages 36-46  Pages 20-23</p> <p>Page 30  Pages 22-39</p> <p>Pages 76-77  Pages 120-134  Pages 31-32, 34</p>
<p>5. Students will create and use a classification system to group a variety of plants and animals according to their similarities and differences.</p>	<p><b>Insects</b>  Investigation 1 Part 2  <i>Insects FOSS Science Stories</i>  <b>New Plants</b>  Investigation 2, Parts 1-3  <i>New Plants FOSS Science Stories</i>  <b>Plants and Animals FOSS Science Resources</b>  <b>Insects and Plants FOSS Science Resources</b></p> <p><b>[Note: This benchmark is addressed in the grade 2 essential learning expectations]</b></p>	<p>Pages 14-19  Pages 34-35</p> <p>Pages 8-28  Pages 40-43  Pages 47-50  Pages 30-31</p>

### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will describe and give examples of Earth's changing features.	<b>Air and Weather</b> Investigation 2 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 1 Parts 1-2 <i>Pebbles, Sand, and Silt FOSS Science Stories</i>	Pages 20-23  Pages 8-17 Pages 10-14
2. Students will describe and measure the physical properties of Earth's basic materials (including soil, rocks, water and gases) and the resources they provide.	<b>Air and Weather</b> Investigation 1 Parts 1-6 <b>Pebbles, Sand, and Silt</b> Investigation 2 Parts 1-4 <i>Pebbles, Sand, and Silt FOSS Science Stories</i> <b>Solids and Liquids</b> Investigation 2 Science Extensions 2-3  [Note: This benchmark is addressed in the grade 2 essential learning expectations]	Pages 8-38  Pages 8-29 Pages 3-7  Pages 30-31
3. Students will investigate fossils and make inferences about life the plants, animals, and the environment at that time.	<b>Pebbles, Sand, and Silt</b> <i>FOSS Science Stories</i>  [Note: This benchmark is addressed in the grade 2 essential learning expectations]	Pages 26-31
4. Students will observe and describe the water cycle and the local weather and demonstrate how weather conditions are measured.	<b>Air and Weather</b> Investigation 4 Part 1 <i>Air and Weather FOSS Science Stories</i>	Pages 8-11 Pages 7-17
5. Students will identify seasons and explain the difference between weather and climate.	<b>Air and Weather</b> Investigation 4 Part 2 <i>Air and Weather FOSS Science Stories</i>  [Note: This benchmark is addressed in the grade 2 essential learning expectations]	Pages 12-18 Pages 18-23
6. Students will identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the Sun.	<b>Air and Weather</b> Investigation 4 Part 3	Pages 19-24
7. Students will identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes).		

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will describe and discuss examples of how people use science and technology.	<b>Air and Weather</b> Investigation 4 Parts 1-2 <i>Air and Weather FOSS Science Stories</i> <b>Balance and Motion</b> Investigation 3 Part 1 <i>Balance and Motion FOSS Science Stories</i> <b>Insects</b> Investigation 6 Science Extension	Pages 8-18 Pages 5, 14-17  Pages 6-12 Pages 14-17  Page 23

	<p><b>New Plants</b> Investigation 3 Science Extension 1 <i>New Plants FOSS Science Stories</i></p> <p><b>Pebbles, Sand, and Silt</b> Investigation 3 Parts 1, 4-5 <i>Pebbles, Sand, and Silt FOSS Science Stories</i></p> <p><b>Solids and Liquids</b> Investigation 1 Part 3 <i>Solids and Liquids FOSS Science Stories</i></p> <p><b>Plants and Animals FOSS Science Resources</b></p>	<p>Page 27 Pages 16-21</p> <p>Pages 8-11, 20-29 Pages 16-19</p> <p>Pages 21-24 Pages 3-7 Pages 9-13</p>
2. Students will describe a scientific or technological innovation that impacts communities, cultures, and societies.	<p><b>Air and Weather</b> Investigation 3 Part 4</p> <p><b>Balance and Motion</b> Investigation 3 Part 1 <i>Balance and Motion FOSS Science Stories</i></p> <p><b>New Plants FOSS Science Stories</b></p> <p><b>Pebbles, Sand, and Silt</b> Investigation 3 Parts 1, 4-5 <i>Pebbles, Sand, and Silt FOSS Science Stories</i></p> <p><b>Solids and Liquids</b> Investigation 1 Part 3 <b>Plants and Animals FOSS Science Resources</b></p> <p>[Note: This benchmark is addressed in the grade 3 essential learning expectations]</p>	<p>Pages 22-27</p> <p>Pages 6-12 Pages 14-17 Pages 16-21</p> <p>Pages 8-11, 20-29 Pages 16-19</p> <p>Pages 21-24 Pages 9-13</p>
3. Students will simulate scientific collaboration by sharing and communicating ideas to identify and describe problems.	<p>Students share and communicate findings and ideas throughout all FOSS investigations, both in the course of hands-on investigations and in the lesson wrap-up. This skill is explicitly written into all FOSS lesson plans.</p> <p><b>Air and Weather</b> Investigation 3 Part 1</p> <p><b>Balance and Motion</b> Investigation 3 Parts 1-3</p> <p><b>New Plants</b> Investigation 3 Parts 1-2</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 4 Part 1</p> <p><b>Solids and Liquids</b> Investigation 1 Part 3</p> <p><b>Plants and Animals</b> Investigation 1 Parts 1-3</p> <p>[Note: This benchmark is addressed in the grade 4 essential learning expectations]</p>	<p>Pages 8-11</p> <p>Pages 6-25</p> <p>Pages 8-18</p> <p>Pages 8-14</p> <p>Pages 21-24</p> <p>Pages 47-72</p>
4. Students will use scientific knowledge to make inferences and propose solutions for simple environmental problems.	<p><b>Pebbles, Sand, and Silt FOSS Science Stories</b></p>	<p>Pages 24-25</p>
5. Students will identify how the knowledge of science and technology influences the development of the Montana American cultures.	<p>Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will easily make between science and technology studied in FOSS and local technology and cultures.</p>	

## **Science Content Standard 6**

Students understand historical developments in science and technology.

<i>BENCHMARKS</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will give historical examples of scientific and technological contributions to communities, cultures and societies, including Montana American Indian examples.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations and end of module projects. It can also be addressed through connections that Montana teachers will easily make between history of science and technology examples studied in FOSS and local history, technology and cultures.  [ <b>Note:</b> This benchmark is addressed in the grade 3 essential learning expectations]	
2. Students will describe how scientific inquiry has produced much knowledge about the world and a variety of contributions toward understanding events and phenomenon within the universe.	<b><i>Air and Weather</i></b> FOSS Science Stories <b><i>Pebbles, Sand, and Silt</i></b> FOSS Science Stories <b><i>Solids and Liquids</i></b> FOSS Science Stories	Pages 14-17 Pages 24-25, 26-31 Pages 8-23
3. Students will describe science as a human endeavor and an ongoing process.	<b><i>New Plants</i></b> FOSS Science Stories <b><i>Pebbles, Sand, and Silt</i></b> FOSS Science Stories	Pages 16-21 Pages 24-25, 26-31

# End of Grade Four Benchmarks

## Grade Two

### Science Content Standard 1

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will develop the abilities necessary to safely conduct scientific inquiry, including (a step-by-step sequence is not implied): (a) asking questions about objects, events, and organisms in the environment, (b) planning and conducting simple investigations.	FOSS is an inquiry based program and provides ample opportunity to address this benchmark through its investigations. See examples below. <b>Air and Weather</b> Inv. 3 Part 1, Science Ext. 1 (Student Projects) <b>Balance and Motion</b> Investigation 1 Science Ext. 7 (Student Projects) <b>New Plants</b> Investigation 1 Science Ext. 3 (Student Projects) <b>Pebbles, Sand, and Silt</b> Investigation 4 Part 3 <b>Solids and Liquids</b> Investigation 4 Part 3 <b>Plants and Animals</b> Investigation 1 Parts 1-3 <b>Insects and Plants</b> Investigation 3 Parts 1-3	Pages 8-11, 39 Page 32 Page 31 Pages 19-25 Pages 23-27 Pages 47-72 Pages 129-151
2. Students will select and use appropriate tools including technology to make measurements (including metric units) and represent results of basic scientific investigations.	<b>Air and Weather</b> Investigation 3 Part 2 <b>Balance and Motion</b> Investigation 3 Math Extension Problem A <b>Insects</b> Investigation 1 Science Extension 1 <b>New Plants</b> Investigation 2 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 2 Parts 1-2 <b>Solids and Liquids</b> Investigation 3 Part 2 <b>Insects and Plants</b> Investigation 2 Part 3	Pages 12-16 Page 27 Page 27 Pages 20-28 Pages 8-17 Pages 19-23 Pages 105-115
3. Students will use data to describe and communicate the results of scientific investigations.	<b>Air and Weather</b> Investigation 2 Science Extensions 2, 3, 4 <b>Balance and Motion</b> Investigation 3 Math Extension 2 <b>Insects</b> Investigation 5 Science Extension 2 <b>New Plants</b> Investigation 1 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 2 Math Extension Problem A <b>Solids and Liquids</b> Investigation 4 Math Extension Problem A <b>Insects and Plants</b> Investigation 3 Parts 1-3	Page 31 Page 27 Page 27 Pages 23-30 Page 30 Page 28 Pages 105-115
4. Students will use models that illustrate simple concepts and compare those models to the actual phenomenon.	<b>Air and Weather</b> Investigation 1 Part 6 <b>Balance and Motion</b> Investigation 3 Part 1 <b>Insects</b> Investigation 1 Part 2	Pages 34-38 Pages 6-12 Pages 16-21

	<b>New Plants</b> Investigation 2 Parts 1-2 <b>Pebbles, Sand, and Silt</b> Investigation 4 Part 1 <b>Solids and Liquids</b> Investigation 1 Part 3 <b>Insects and Plants</b> Investigation 3 Parts 1-3	Pages 15-28  Pages 8-14  Pages 21-24  Pages 71-75
5. Students will identify a valid test in an investigation.	<b>Animals Two by Two</b> Investigation 4 Part 2 <b>Fabric</b> Investigation 2 Part 1 <b>Trees</b> Investigation 1 Part 4 <b>Wood and Paper</b> Investigation 1 Parts 4, 5 <b>Air and Weather</b> Investigation 1 Part 5 <b>Balance and Motion</b> Investigation 1 Part 3 <b>Insects</b> Investigation 1 Part 2 <b>New Plants</b> Investigation 2 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 4 Part 3 <b>Solids and Liquids</b> Investigation 4 Part 3 <b>Plants and Animals</b> Investigation 1 Part 3  [Note: This benchmark is addressed in the grade 3 essential learning expectations]	Pages 12-15  Pages 7-11  Pages 23-24  Pages 24-32  Pages 27-33  Pages 19-23  Pages 16-21  Pages 15-19  Pages 19-25  Pages 23-27  Pages 63-72
6. Students will identify how observations of nature form an essential base of knowledge among the Montana American Indians.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and customs.	

### **Science Content Standard 2**

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will create mixtures and separate them based on different physical properties (e.g., salt and sand, iron filings and soil, oil and water).	<b>Pebbles, Sand, and Silt</b> Investigation 4 Part 1 <b>Solids and Liquids</b> Investigation 3 Part 2 <i>Solids and Liquids FOSS Science Stories</i>	Pages 8-14  Pages 14-18 Pages 18-23
2. Students will examine, measure, describe, compare and classify objects in terms of common physical properties.	<b>Pebbles, Sand, and Silt</b> Investigation 1 Parts 1-4 <i>Pebbles, Sand, and Silt FOSS Science Stories</i> <b>Solids and Liquids</b> Investigation 1 Parts 1-2 <i>Solids and Liquids FOSS Science Stories</i>	Pages 8-25 Pages 3-9  Pages 8-20 Pages 8-13
3. Students will identify the basic characteristics of light, heat, motion, magnetism, electricity and sound.	<b>Air and Weather</b> Investigation 2 Part 2 (heat) Investigation 3 Parts 1-5 (motion) <i>Air and Weather FOSS Science Stories</i>	Pages 14-19 Pages 8-33 Page 21

	<p><b>Balance and Motion</b> Investigation 2 Part 1 (motion) Investigation 2 Science Extension (magnetism) <i>Balance and Motion FOSS Science Stories</i></p> <p><b>New Plants</b> Investigation 1 Part 2</p> <p><b>Solids and Liquids</b> Investigation 3 Science Extension 1 (magnetism)</p> <p>[Note: This benchmark is addressed in the grades 1, 3 and 4 essential learning expectations]</p>	<p>Pages 8-13 Page 28 Pages 10-13, 18-35</p> <p>Pages 13-22</p> <p>Page 31</p>
4. Students will model and explain that matter exists as solids, liquids, and gases and can change from one form to another.	<p><b>Air and Weather</b> Investigation 2 Science Extension 7 <i>Air and Weather FOSS Science Stories</i></p> <p><b>Solids and Liquids</b> Investigation 2 Science Extension 3 Investigation 4 Parts 1-3, Science Extension 1 <i>Solids and Liquids FOSS Science Stories</i></p> <p>[Note: This benchmark is addressed in the grades K, 1, 3 and 4 essential learning expectations]</p>	<p>Page 32 Pages 8-9, 12</p> <p>Page 30 Pages 7-27, 29 Pages 3-7, 14-17</p>
5. Students will identify that the position of an object can be described by its location relative to another object and its motions described, and measured by external forces action upon it.	<p><b>Balance and Motion</b> Investigation 1 Part 3 <i>Balance and Motion FOSS Science Stories</i></p> <p>[Note: This benchmark is addressed in the grades 2 and 3 essential learning expectations]</p>	<p>Pages 19-23 Pages 3-13, 18-21</p>
6. Students will identify, build, and describe mechanical systems and the forces acting within those systems.	<p><b>Air and Weather</b> Investigation 3 Parts 3-4</p> <p><b>Balance and Motion</b> Investigation 2 Part 1</p>	<p>Pages 17-27</p> <p>Pages 8-13</p>
7. Students will observe, measure and manipulate forms of energy: sound, light, heat, electric, magnets	<p><b>Air and Weather</b> Investigation 2 Part 2 (heat) Investigation 3 Parts 1-5 (motion) <i>Air and Weather FOSS Science Stories</i></p> <p><b>Balance and Motion</b> Investigation 2 Part 1 (motion) Investigation 2 Science Extension (magnetism) <i>Balance and Motion FOSS Science Stories</i></p> <p><b>New Plants</b> Investigation 1 Part 2</p> <p><b>Solids and Liquids</b> Investigation 3 Science Extension 1 (magnetism)</p> <p>[Note: This benchmark is addressed in the grades 1, 3 and 4 essential learning expectations]</p>	<p>Pages 14-19 Pages 8-33 Page 21</p> <p>Pages 8-13 Page 28 Pages 10-13, 18-35</p> <p>Pages 13-22</p> <p>Page 31</p>

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will identify that plants and animals have structures and systems that serve different functions for	<p><b>Insects</b> Investigation 1 Part 2 <i>Insects FOSS Science Stories</i></p> <p><b>New Plants</b></p>	<p>Pages 16-21 Pages 8-11, 12-15</p>

<p>growth, survival, and reproduction.</p>	<p>Investigation 1 Part 2  <i>New Plants FOSS Science Stories</i>  <b>Plants and Animals</b>  Investigation 2 Parts 1-3  Investigation 4 Parts 1-2  <i>Plants and Animals FOSS Science Resources</i>  Video: How Plants Get Food  <b>Insects and Plants</b>  Investigation 1 Parts 1-3  Investigation 2 Part 3  <i>Insects and Plants FOSS Science Resources</i></p> <p>[Note: This benchmark is addressed in the grades 3 and 4 essential learning expectations]</p>	<p>Pages 13-22  Pages 40-43</p> <p>Pages 87-108  Pages 151-165  Pages 4-7, 28-50</p> <p>Pages 52-75  Pages 105-115  Pages 15-18, 30-33</p>
<p>2. Students will identify, measure, and describe basic requirements of energy and nutritional needs for an organism.</p>	<p><b>Insects</b> throughout, such as  Investigation 3 Part 2  <b>New Plants</b>  Investigation 1 Parts 2-3  <i>New Plants FOSS Science Stories</i>  <i>Physics of Sound FOSS Science Stories</i>  <b>Plants and Animals</b>  Investigation 1 Part 1  Investigation 3 Parts 1-2  <i>Plants and Animals FOSS Science Resources</i>  <b>Insects and Plants</b>  Investigation 1 Part 1  Investigation 4 Part 2</p> <p>[Note: This benchmark is addressed in the grades 1, 3 and 4 essential learning expectations]</p>	<p>Pages 12-20</p> <p>Pages 13-30  Pages 3-7  Pages 24-25</p> <p>Pages 47-57  Pages 120-134  Pages 3-7, 21-23</p> <p>Pages 52-61  Pages 170-174</p>
<p>3. Students will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.</p>	<p><b>Insects</b>  Investigation 3 Part 3  <i>Insects FOSS Science Stories</i>  <b>New Plants</b>  Investigation 1 Science Extension 1  <i>New Plants FOSS Science Stories</i>  <b>Insects and Plants</b>  Investigation 1-5 all parts  <i>Insects and Plants FOSS Science Resources</i></p>	<p>Pages 21-26  Pages 16-33</p> <p>Page 32  Pages 12-15</p> <p>Pages 37-55</p>
<p>4. Students will explain cause and effect relationships between nonliving and living components within ecosystems; and explain individual response to the changes in the environment including identifying differences between inherited, instinctual, and learned behaviors.</p>	<p><i>Insects FOSS Science Stories</i>  <i>Pebbles, Sand, and Silt FOSS Science Stories</i>  <b>New Plants</b>  Investigation 2 Science Extensions 2, 3, 4  <i>New Plants FOSS Science Stories</i>  <b>Plants and Animals</b>  Investigation 1 Science Extension  Investigation 3 Parts 1-2  <i>Plants and Animals FOSS Science Resources</i></p> <p>[Note: This benchmark is addressed in the grade 4 essential learning expectations]</p>	<p>Pages 36-46  Pages 20-23</p> <p>Page 30  Pages 22-39</p> <p>Pages 76-77  Pages 120-134  Pages 31-32, 34</p>
<p>5. Students will create and use a classification system to group a variety of plants and animals according to their similarities and differences.</p>	<p><b>Insects</b>  Investigation 1 Part 2  <i>Insects FOSS Science Stories</i>  <b>New Plants</b>  Investigation 2, Parts 1-3  <i>New Plants FOSS Science Stories</i>  <b>Plants and Animals FOSS Science Resources</b>  <i>Insects and Plants FOSS Science Resources</i></p>	<p>Pages 14-19  Pages 34-35</p> <p>Pages 8-28  Pages 40-43  Pages 47-50  Pages 30-31</p>

### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will describe and give examples of Earth's changing features.	<b>Air and Weather</b> Investigation 2 Part 3 <b>Pebbles, Sand, and Silt</b> Investigation 1 Parts 1-2 <i>Pebbles, Sand, and Silt FOSS Science Stories</i>	Pages 20-23  Pages 8-17 Pages 10-14
2. Students will describe and measure the physical properties of Earth's basic materials (including soil, rocks, water and gases) and the resources they provide.	<b>Air and Weather</b> Investigation 1 Parts 1-6 <b>Pebbles, Sand, and Silt</b> Investigation 2 Parts 1-4 <i>Pebbles, Sand, and Silt FOSS Science Stories</i> <b>Solids and Liquids</b> Investigation 2 Science Extensions 2-3	Pages 8-38  Pages 8-29 Pages 3-7  Pages 30-31
3. Students will investigate fossils and make inferences about life the plants, animals, and the environment at that time.	<b>Pebbles, Sand, and Silt FOSS Science Stories</b>	Pages 26-31
4. Students will observe and describe the water cycle and the local weather and demonstrate how weather conditions are measured.	<b>Air and Weather</b> Investigation 4 Part 1 <i>Air and Weather FOSS Science Stories</i>	Pages 8-11 Pages 7-17
5. Students will identify seasons and explain the difference between weather and climate.	<b>Air and Weather</b> Investigation 4 Part 2 <i>Air and Weather FOSS Science Stories</i>	Pages 12-18 Pages 18-23
6. Students will identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the Sun.	<b>Air and Weather</b> Investigation 4 Part 3  [Note: This benchmark is addressed in the grades 1, 3 and 4 essential learning expectations]	Pages 19-24
7. Students will identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes).	  [Note: This benchmark is addressed in the grades 1 and 3 essential learning expectations]	

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will describe and discuss examples of how people use science and technology.	<b>Air and Weather</b> Investigation 4 Parts 1-2 <i>Air and Weather FOSS Science Stories</i> <b>Balance and Motion</b> Investigation 3 Part 1 <i>Balance and Motion FOSS Science Stories</i> <b>Insects</b> Investigation 6 Science Extension <b>New Plants</b> Investigation 3 Science Extension 1 <i>New Plants FOSS Science Stories</i> <b>Pebbles, Sand, and Silt</b> Investigation 3 Parts 1, 4-5	Pages 8-18 Pages 5, 14-17  Pages 6-12 Pages 14-17  Page 23  Page 27 Pages 16-21  Pages 8-11, 20-29

	<i>Pebbles, Sand, and Silt FOSS Science Stories</i> <b>Solids and Liquids</b> Investigation 1 Part 3 <i>Solids and Liquids FOSS Science Stories</i> <b>Plants and Animals FOSS Science Resources</b>	Pages 16-19  Pages 21-24 Pages 3-7 Pages 9-13
2. Students will describe a scientific or technological innovation that impacts communities, cultures, and societies.	<b>Air and Weather</b> Investigation 3 Part 4 <b>Balance and Motion</b> Investigation 3 Part 1 <i>Balance and Motion FOSS Science Stories</i> <b>New Plants FOSS Science Stories</b> <b>Pebbles, Sand, and Silt</b> Investigation 3 Parts 1, 4-5 <i>Pebbles, Sand, and Silt FOSS Science Stories</i> <b>Solids and Liquids</b> Investigation 1 Part 3 <b>Plants and Animals FOSS Science Resources</b>  [Note: This benchmark is addressed in the grade 3 essential learning expectations]	Pages 22-27  Pages 6-12 Pages 14-17 Pages 16-21  Pages 8-11, 20-29 Pages 16-19  Pages 21-24 Pages 9-13
3. Students will simulate scientific collaboration by sharing and communicating ideas to identify and describe problems.	Students share and communicate findings and ideas throughout all FOSS investigations, both in the course of hands-on investigations and in the lesson wrap-up. This skill is explicitly written into all FOSS lesson plans. <b>Air and Weather</b> Investigation 3 Part 1 <b>Balance and Motion</b> Investigation 3 Parts 1-3 <b>New Plants</b> Investigation 3 Parts 1-2 <b>Pebbles, Sand, and Silt</b> Investigation 4 Part 1 <b>Solids and Liquids</b> Investigation 1 Part 3 <b>Plants and Animals</b> Investigation 1 Parts 1-3  [Note: This benchmark is addressed in the grade 4 essential learning expectations]	Pages 8-11  Pages 6-25  Pages 8-18  Pages 8-14  Pages 21-24  Pages 47-72
4. Students will use scientific knowledge to make inferences and propose solutions for simple environmental problems.	<b>Pebbles, Sand, and Silt FOSS Science Stories</b>	Pages 24-25
5. Students will identify how the knowledge of science and technology influences the development of the Montana American cultures.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will easily make between science and technology studied in FOSS and local technology and cultures.	

### **Science Content Standard 6**

Students understand historical developments in science and technology.

<i>BENCHMARKS</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will give historical examples of scientific and technological contributions to	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations and end of	

<p>communities, cultures and societies, including Montana American Indian examples.</p>	<p>module projects. It can also be addressed through connections that Montana teachers will easily make between history of science and technology examples studied in FOSS and local history, technology and cultures.</p> <p><b>[Note:</b> This benchmark is addressed in the grade 3 essential learning expectations]</p>	
<p>2. Students will describe how scientific inquiry has produced much knowledge about the world and a variety of contributions toward understanding events and phenomenon within the universe.</p>	<p><b><i>Air and Weather</i></b> FOSS Science Stories  <b><i>Pebbles, Sand, and Silt</i></b> FOSS Science Stories  <b><i>Solids and Liquids</i></b> FOSS Science Stories</p>	<p>Pages 14-17  Pages 24-25, 26-31  Pages 8-23</p>
<p>3. Students will describe science as a human endeavor and an ongoing process.</p>	<p><b><i>New Plants</i></b> FOSS Science Stories  <b><i>Pebbles, Sand, and Silt</i></b> FOSS Science Stories</p>	<p>Pages 16-21  Pages 24-25, 26-31</p>

# End of Grade Four Benchmarks Grade Three

## **Science Content Standard 1**

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will develop the abilities necessary to safely conduct scientific inquiry, including (a step-by-step sequence is not implied): (a) asking questions about objects, events, and organisms in the environment, (b) planning and conducting simple investigations.	<p>FOSS is an inquiry based program and provides ample opportunity to address this benchmark through its investigations. See examples below.</p> <p><b>Earth Materials</b> Investigation 4 Parts 1-2</p> <p><b>Human Body</b> Investigation 4 Part 4</p> <p><b>Ideas and Inventions</b> Investigation 4 Part 4</p> <p><b>Magnetism and Electricity</b> Investigation 3 Parts 1-3</p> <p><b>Measurement</b> Investigation 2 Parts 1-3</p> <p><b>Physics of Sound</b> Investigation 4 Part 2</p> <p><b>Structures of Life</b> Investigation 1 Part 3</p> <p><b>Water</b> Investigation 3 Part 4</p> <p><b>Sun, Moon and Stars</b> Investigation 1 Parts 1-2</p> <p><b>Matter and Energy</b> Investigation 2 Parts 1-2</p>	<p>Pages 8-18</p> <p>Pages 25-29</p> <p>Pages 22-25</p> <p>Page 10-26</p> <p>Pages 8-21</p> <p>Pages 16-20</p> <p>Pages 28-33</p> <p>Pages 21-26</p> <p>Pages 42-64</p> <p>Pages 93-114</p>
2. Students will select and use appropriate tools including technology to make measurements (including metric units) and represent results of basic scientific investigations.	<p><b>Earth Materials</b> Investigation 3 Parts 1-2</p> <p><b>Human Body</b> Investigation 4 Parts 1-3</p> <p><b>Ideas and Inventions</b> Investigation 4 Part 1</p> <p><b>Magnetism and Electricity</b> Investigation 1 Part 3</p> <p><b>Measurement</b> Investigation 4 Part 3 <i>Measurement FOSS Science Stories</i></p> <p><b>Structures of Life</b> Investigation 2 Part 3</p> <p><b>Water</b> Investigation 3 Part 2</p> <p><b>Sun, Moon and Stars</b> Investigation 1 Part 1</p> <p><b>Matter and Energy</b> Investigation 3 Parts 2-3</p>	<p>Pages 8-19</p> <p>Pages 8-24</p> <p>Pages 8-13</p> <p>Page 23-29</p> <p>Pages 18-21 <i>Pages 18-20</i></p> <p>Pages 18-22</p> <p>Pages 12-16</p> <p>Pages 42-55</p> <p>Pages 139-160</p>
3. Students will use data to describe and communicate the results of scientific investigations.	<p><b>Earth Materials</b> Investigation 2 Part 2</p> <p><b>Human Body</b> Investigation 1 Part 1</p> <p><b>Ideas and Inventions</b> Investigation 2 Math Ext. Problem of the Week</p> <p><b>Magnetism and Electricity</b> Investigation 1 Part 3</p> <p><b>Measurement</b></p>	<p>Pages 14-21</p> <p>Pages 8-15</p> <p>Page 23</p> <p>Pages 23-29</p>

	Investigation 4 Part 2 <b>Physics of Sound</b> Investigation 2 Parts 1-3 <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 3 Part 4 <b>Water</b> Investigation 3 Part 3 <b>Sun, Moon and Stars</b> Investigation 1 Part 2 <b>Matter and Energy</b> Investigation 3 Part 2	Pages 14-15  Pages 8-24 Pages 19-20  Pages 24-30  Pages 17-20  Pages 56-64  Pages 139-150
4. Students will use models that illustrate simple concepts and compare those models to the actual phenomenon.	<b>Earth Materials</b> Investigation 1 Parts 1-2 <b>Human Body</b> Investigation 3 Parts 1-3 <i>Human Body FOSS Science Stories</i> <b>Ideas and Inventions</b> Investigation 2 Part 1 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 2 Parts 1-2 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 1 Part 1 <b>Physics of Sound</b> Investigation 3 Part 1 <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 3 Part 2 <b>Water</b> Investigation 2 Part 1 <b>Sun, Moon and Stars</b> Investigation 2 Part 2 <b>Matter and Energy</b> Investigation 4 Part 2 <i>Matter and Energy FOSS Science Resources</i>	Pages 8-23  Pages 8-21 Pages 12-13  Pages 8-15 Pages 14, 32, 36  Page 8-19 Pages 5, 9, 33  Pages 8-15  Pages 8-14 Pages 17-18  Pages 16-19  Pages 8-13  Pages 89-100  Pages 181-192 Pages 57-59
5. Students will identify a valid test in an investigation.	<b>Earth Materials</b> Investigation 3 Parts 1-2 <b>Human Body</b> Investigation 4 Parts 1-3 <b>Ideas and Inventions</b> Investigation 3 Part 2 <b>Magnetism and Electricity</b> Investigation 2 Part 3 <b>Measurement</b> Investigation 2 Part 3 <b>Structures of Life</b> Investigation 4/5 Part 3 <b>Water</b> Investigation 4 Part 1 <b>Sun, Moon and Stars</b> Investigation 1 Part 1 <b>Matter and Energy</b> Investigation 3 Part 2	Pages 8-19  Pages 8-24  Pages 14-17  Pages 20-25  Pages 18-21  Pages 20-24  Pages 8-13  Pages 42-55  Pages 139-150
6. Students will identify how observations of nature form an essential base of knowledge among the Montana American Indians.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations	Page 19

	in FOSS and local environments and customs. <b>Earth Materials</b> Investigation 4 Language Extension 2 <i>Earth Materials FOSS Science Stories</i> <b>Ideas and Inventions</b> Investigation 3 Science Extension 3 <b>Magnetism and Electricity</b> Investigation 2 Social Studies Extension 2	Page 19 Pages 16-19  Page 24  Page 32
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## **Science Content Standard 2**

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will create mixtures and separate them based on different physical properties (e.g., salt and sand, iron filings and soil, oil and water).	<b>Earth Materials</b> Investigation 1 Parts 2-3 <b>Magnetism and Electricity</b> Investigation 1 Part 1 <b>Structures of Life</b> Investigation 1 Part 1 <b>Water</b> Investigation 4 Parts 1, 3	Pages 16-29  Pages 8-17  Pages 8-17  Pages 8-13, 19-23
2. Students will examine, measure, describe, compare and classify objects in terms of common physical properties.	<b>Earth Materials</b> Investigation 2 Parts 1-2 <i>Earth Materials FOSS Science Stories</i> <b>Human Body</b> Investigation 1 Part 3 <b>Ideas and Inventions</b> Investigation 1 Part 2 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 1 Parts 1-2 <b>Measurement</b> Investigation 2 Science Extension 3 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 1 Parts 1-2 <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 1 Part 1 <b>Water</b> Investigation 1 Parts 1-2 <b>Matter and Energy</b> Investigation 3 Part 1 <i>Matter and Energy FOSS Science Resources</i>	Pages 8-21 Pages 30-33, 37  Pages 21-25  Pages 14-17 Pages 4-7, 11-14  Pages 8-22  Page 24 Pages 30-33  Pages 8-20 Pages 19-20  Pages 8-17  Pages 8-18  Pages 129-138 Pages 39-42
3. Students will identify the basic characteristics of light, heat, motion, magnetism, electricity and sound.	<b>Ideas and Inventions</b> Investigation 4 Parts 1-2 (light) <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 1 Parts 1-4 (magnetism) Investigation 2 Parts 1-4 (electricity) <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 4 Parts 1-2 (heat) <b>Physics of Sound</b> Investigation 1 Part 3 (motion) Investigation 2 Parts 1-3 (sound) Investigation 3 Parts 1-2 (sound) <i>Physics of Sound FOSS Science Stories</i> <b>Water</b> Investigation 2 Parts 1-3 (heat)	Pages 8-17 Pages 28-31  Pages 8-34 Pages 8-29 Pages 6-11, 32-33  Pages 8-17  Pages 21-29 Pages 8-24 Pages 8-19 P 11-14, 17-21, 25-27  Pages 8-24

	<i>Water FOSS Science Stories</i> <b>Matter and Energy</b> Investigation 1 Parts 1, 3 Investigation 2 Parts 1-2 <i>Matter and Energy FOSS Science Resources</i>	Pages 5-7, 15-16  Pages 50-62, 71-82 Pages 93-114 Pages 24-36
4. Students will model and explain that matter exists as solids, liquids, and gases and can change from one form to another.	<b>Earth Materials</b> Investigation 1 Part 3 <i>Measurement FOSS Science Stories</i> <b>Water</b> Investigation 2 Part 3 Investigation 3 Parts 1-4 <i>Water FOSS Science Stories</i> <b>Matter and Energy</b> Investigation 4 Parts 1-2 <i>Matter and Energy FOSS Science Resources</i>	Pages 24-29 Pages 32-33  Pages 19-24 Pages 8-26 Pages 13, 14-16  Pages 174-192 Pages 39-42, 54-56
5. Students will identify that the position of an object can be described by its location relative to another object and its motions described, and measured by external forces action upon it.	<b>Magnetism and Electricity</b> Investigation 1 Part 3 <b>Measurement</b> Investigation 4 Part 1 <b>Water</b> Investigation 1 Part 3	Pages 23-29  Pages 8-13  Pages 19-23
6. Students will identify, build, and describe mechanical systems and the forces acting within those systems.	<b>Water</b> Investigation 4 Part 2 <b>Earth Materials</b> Investigation 3 Science Extension 1 <b>Human Body</b> Investigation 3 Parts 1-3 <b>Ideas and Inventions</b> Investigation 4 Parts 1-2 <b>Magnetism and Electricity</b> Investigation 2 Part 2 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 2 Parts 1-3  [Note: This benchmark is addressed in the grades 2 and 4 essential learning expectations]	Pages 14-18  Page 24  Pages 8-21  Pages 8-17  Pages 14-19 Pages 5, 28-31  Pages 8-24
7. Students will observe, measure and manipulate forms of energy: sound, light, heat, electric, magnets	<b>Ideas and Inventions</b> Investigation 4 Parts 1-2 (light) <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 1 Parts 1-4 (magnetism) Investigation 2 Parts 1-4 (electricity) <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 4 Parts 1-2 (heat) <b>Physics of Sound</b> Investigation 1 Part 3 (motion) Investigation 2 Parts 1-3 (sound) Investigation 3 Parts 1-2 (sound) <i>Physics of Sound FOSS Science Stories</i> <b>Water</b> Investigation 2 Parts 1-3 (heat) <i>Water FOSS Science Stories</i> <b>Matter and Energy</b> Investigation 1 Parts 1, 3 Investigation 2 Parts 1-2 <i>Matter and Energy FOSS Science Resources</i>	Pages 8-17 Pages 28-31  Pages 8-34 Pages 8-29 Pages 6-11, 32-33  Pages 8-17  Pages 21-29 Pages 8-24 Pages 8-19 P 11-14, 17-21, 25-27  Pages 8-24 Pages 5-7, 15-16  Pages 50-62, 71-82 Pages 93-114 Pages 24-36

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will identify that plants and animals have structures and systems that serve different functions for growth, survival, and reproduction.	This standard is a primary focus of the life science kits designed for Grades 3-4. See for example: <b>Human Body</b> Investigation 2 Part 4 <i>Human Body FOSS Science Stories</i> <b>Physics of Sound</b> <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 2 Part 1 (plant structures) Investigation 3 Part 1 (animal structures) <i>Structures of Life FOSS Science Stories</i>	Pages 23-25 Pages 1-4,8-16,28-29 Pages 7-10  Pages 8-13 Pages 8-15 Pages 2, 17, 41-42
2. Students will identify, measure, and describe basic requirements of energy and nutritional needs for an organism.	<b>Structures of Life</b> Investigation 2 Parts 2-3 Investigation 3 Parts 2-4 <i>Structures of Life FOSS Science Stories</i> <b>Water</b> <i>FOSS Science Stories</i>	Pages 14-22 Pages 16-30 Pages 10-16, 43 Pages 5-7
3. Students will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.	<b>Structures of Life</b> Investigation 2 Part 3 <a href="http://www.fossweb.com">www.fossweb.com</a> "Life Cycles" Activity <i>Structures of Life FOSS Science Stories</i>	Pages 18-22  Pages 20-21, 40
4. Students will explain cause and effect relationships between nonliving and living components within ecosystems; and explain individual response to the changes in the environment including identifying differences between inherited, instinctual, and learned behaviors.	<b>Human Body</b> <i>FOSS Science Stories</i> <b>Physics of Sound</b> <i>FOSS Science Stories</i> <b>Structures of Life</b> Investigation 3 Parts 3-4 <i>Structures of Life FOSS Science Stories</i> <b>Water</b> <i>FOSS Science Stories</i>  [Note: This benchmark is addressed in the grade 4 essential learning expectations]	Pages 17-20 Page 21  Pages 20-30 Pages 6-9, 22-36 Pages 5-7, 24-26
5. Students will create and use a classification system to group a variety of plants and animals according to their similarities and differences.	<b>Physics of Sound</b> <i>FOSS Science Stories</i> <b>Structures of Life</b> Investigations 4 & 5 Part 2 <i>Structures of Life FOSS Science Stories</i>  [Note: This benchmark is addressed in the grade 4 essential learning expectations]	Pages 7-8  Pages 13/14-24 Pages 41-42

### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe and give examples of Earth's changing features.	<b>Earth Materials</b> Investigation 3 Science Extension 1 <i>Earth Materials FOSS Science Stories</i> <b>Water</b> Investigation 1 Science Extension 1 <i>Water FOSS Science Stories</i>	Page 24 Pages 1-7  Page 27 Pages 8-9, 22-23
2. Students will describe and measure the physical properties of Earth's basic materials (including soil, rocks, water and gases) and the	<b>Earth Materials</b> Investigation 1 Parts 1-3 <i>Earth Materials FOSS Science Stories</i> <b>Measurement</b> Investigation 2 Science Extensions 1-2	Pages 8-29 Pages 12-13, 24-33  Pages 23-24

resources they provide.	<i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 3 Parts 1-2 <b>Water</b> Investigation 3 Parts 1-4  [Note: This benchmark is addressed in the grade 4 essential learning expectations]	Pages 30-33  Pages 8-19  Pages 8-26
3. Students will investigate fossils and make inferences about life the plants, animals, and the environment at that time.	<b>Earth Materials</b> FOSS Science Stories <b>Human Body</b> FOSS Science Stories <b>Structures of Life</b> FOSS Science Stories  [Note: This benchmark is addressed in the grade 4 essential learning expectations]	Pages 1-4 Pages 21-24 Pages 45-48
4. Students will observe and describe the water cycle and the local weather and demonstrate how weather conditions are measured.	<b>Water</b> Investigation 3 Part 4 <i>Water FOSS Science Stories</i>	Pages 21-26 Pages 14-16
5. Students will identify seasons and explain the difference between weather and climate.		
6. Students will identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the Sun.	<b>Ideas and Inventions</b> Teacher Guide Supplement Activities <i>Ideas and Inventions FOSS Science Stories</i> <b>Physics of Sound</b> FOSS Science Stories <b>Sun, Moon and Stars</b> Investigation 1 Parts 1-2 Investigation 2 Parts 1-2 Investigation 3 Parts 1-2 <i>Sun, Moon and Stars FOSS Science Resources</i>	Pages 1-8 Pages 33-37 Page 22  Pages 42-64 Pages 79-100 Pages 114-130 Pages 1-38
7. Students will identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes).	<b>Human Body</b> FOSS Science Stories <b>Measurement</b> FOSS Science Stories <b>Water</b> FOSS Science Stories <b>Ideas and Inventions</b> FOSS Science Stories <b>Sun, Moon and Stars</b> FOSS Science Resources	Pages 17-20 Pages 14-15 Pages 27-29 Pages 33-37 Pages 40-43

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe and discuss examples of how people use science and technology.	<b>Earth Materials</b> Investigation 1 Science Extensions 4, 5 <i>Earth Materials FOSS Science Stories</i> <b>Human Body</b> Investigation 2 Language Extension 2 <i>Human Body FOSS Science Stories</i> <b>Ideas and Inventions</b> Investigation 2 Part 2 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 2 Parts 1-3 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 1 Part 1 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 1 Part 2 <i>Physics of Sound FOSS Science Stories</i>	Page 32 Pages 12-13, 24-29  Page 26 Pages 5-7, 17-27  Pages 16-19 Pages 1-3, 11-14, 17  Page 8-25 Pages 5, 14, 28-33  Pages 8-15 P 11-15, 18-19, 22-29  Pages 16-20 Pages 21, 25-36

	<p><b>Structures of Life</b> Investigation 2 Science Extension 2 <i>Structures of Life FOSS Science Stories</i></p> <p><b>Water</b> Investigation 2 Part 1 <i>Water FOSS Science Stories</i> <b>Sun, Moon and Stars</b> FOSS Science Resources</p> <p>[Note: This benchmark is addressed in the grades 1, 2 and 4 essential learning expectations]</p>	<p>Page 2 Pages 10-11</p> <p>Pages 8-13 Pages 10-11, 17-26 Pages 40-43</p>
<p>2. Students will describe a scientific or technological innovation that impacts communities, cultures, and societies.</p>	<p><b>Earth Materials</b> Investigation 1 Science Extensions 3, 4 <i>Earth Materials FOSS Science Stories</i></p> <p><b>Human Body</b> Investigation 2 Language Extension 4 <i>Human Body FOSS Science Stories</i></p> <p><b>Ideas and Inventions</b> Investigation 1 Language Extension 4 <i>Ideas and Inventions FOSS Science Stories</i></p> <p><b>Magnetism and Electricity</b> Investigation 2 Parts 1-3 <i>Magnetism and Electricity FOSS Science Stories</i></p> <p><b>Measurement</b> Investigation 1 Part 1 <i>Measurement FOSS Science Stories</i></p> <p><b>Physics of Sound</b> Investigation 4 Social Studies Extension <i>Physics of Sound FOSS Science Stories</i></p> <p><b>Structures of Life</b> Investigation 1 Social Studies Extension <i>Structures of Life FOSS Science Stories</i></p> <p><b>Water</b> Investigation 3 Social Studies Extension <i>Water FOSS Science Stories</i> <b>Sun, Moon and Stars</b> FOSS Science Resources</p>	<p>Page 24 Pages 8-9, 12-13</p> <p>Page 26 Pages 5-7</p> <p>Page 22 P 9-10, 17-18, 21-22</p> <p>Page 8-25 Pgs 14, 16-19, 24-37</p> <p>Pages 8-15 Pgs 5-6, 11-15, 18-20</p> <p>Page 23 Pages 29-31, 32-36</p> <p>Page 35 Pages 6-9</p> <p>Page 28 Pages 18-23, 24-26 Pages 40-43</p>
<p>3. Students will simulate scientific collaboration by sharing and communicating ideas to identify and describe problems.</p>	<p>Students share and communicate findings and ideas throughout all FOSS investigations, both in the course of hands-on investigations and in the lesson wrap-up. This skill is explicitly written into all FOSS lesson plans.</p> <p><b>Earth Materials</b> Investigation 3 Part 2</p> <p><b>Human Body</b> Investigation 4 Part 1</p> <p><b>Ideas and Inventions</b> Investigation 3 Part 3</p> <p><b>Magnetism and Electricity</b> Investigation 3 Part 3</p> <p><b>Measurement</b> Investigation 3 Part 3</p> <p><b>Physics of Sound</b> Investigation 4 Part 1</p> <p><b>Water</b> Investigation 4 Part 2</p> <p><b>Sun, Moon and Stars</b> Investigation 1 Parts 1-2</p> <p><b>Matter and Energy</b> Investigation 3 Part 2</p> <p>[Note: This benchmark is addressed in the grade</p>	<p>Pages 14-19</p> <p>Pages 8-16</p> <p>Pages 18-21</p> <p>Pages 22-26</p> <p>Page 18-21</p> <p>Pages 6-15</p> <p>Pages 14-18</p> <p>Pages 42-64</p> <p>Pages 139-150</p>



understanding events and phenomenon within the universe.	<b>Measurement</b> FOSS Science Stories <b>Structures of Life</b> FOSS Science Stories <b>Water</b> FOSS Science Stories <b>Sun, Moon and Stars</b> FOSS Science Resources	Pages 30-31 Pages 12-16 Pages 24-26 Pages 40-45
3. Students will describe science as a human endeavor and an ongoing process.	<b>Earth Materials</b> FOSS Science Stories <b>Human Body</b> FOSS Science Stories <b>Ideas and Inventions</b> FOSS Science Stories <b>Magnetism and Electricity</b> FOSS Science Stories <b>Measurement</b> FOSS Science Stories  <b>Physics of Sound</b> FOSS Science Stories <b>Structures of Life</b> FOSS Science Stories <b>Water</b> FOSS Science Stories <b>Sun, Moon and Stars</b> FOSS Science Resources	Pages 1-7, Pages 17-24 Pages 9, 11-16,23-27 Pages 12-13, 16-23, 34-37 Pages 5-6,8-9,11-13, 30-31 Pages 29-31 Pgs 6-9, 10-11, 12-16 Pages 17, 21, 27-29 Pages 40-45

# End of Grade Four Benchmarks

## Grade Four

### **Science Content Standard 1**

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will develop the abilities necessary to safely conduct scientific inquiry, including (a step-by-step sequence is not implied): (a) asking questions about objects, events, and organisms in the environment, (b) planning and conducting simple investigations.	FOSS is an inquiry based program and provides ample opportunity to address this benchmark through its investigations. See examples below. <b>Earth Materials</b> Investigation 4 Parts 1-2 <b>Human Body</b> Investigation 4 Part 4 <b>Ideas and Inventions</b> Investigation 4 Part 4 <b>Magnetism and Electricity</b> Investigation 3 Parts 1-3 <b>Measurement</b> Investigation 2 Parts 1-3 <b>Physics of Sound</b> Investigation 4 Part 2 <b>Structures of Life</b> Investigation 1 Part 3 <b>Water</b> Investigation 3 Part 4 <b>Sun, Moon and Stars</b> Investigation 1 Parts 1-2 <b>Matter and Energy</b> Investigation 2 Parts 1-2	Pages 8-18  Pages 25-29  Pages 22-25  Page 10-26  Pages 8-21  Pages 16-20  Pages 28-33  Pages 21-26  Pages 42-64  Pages 93-114
2. Students will select and use appropriate tools including technology to make measurements (including metric units) and represent results of basic scientific investigations.	<b>Earth Materials</b> Investigation 3 Parts 1-2 <b>Human Body</b> Investigation 4 Parts 1-3 <b>Ideas and Inventions</b> Investigation 4 Part 1 <b>Magnetism and Electricity</b> Investigation 1 Part 3 <b>Measurement</b> Investigation 4 Part 3 <i>Measurement FOSS Science Stories</i> <b>Structures of Life</b> Investigation 2 Part 3 <b>Water</b> Investigation 3 Part 2 <b>Sun, Moon and Stars</b> Investigation 1 Part 1 <b>Matter and Energy</b> Investigation 3 Parts 2-3	Pages 8-19  Pages 8-24  Pages 8-13  Page 23-29  Pages 18-21 <i>Pages 18-20</i>  Pages 18-22  Pages 12-16  Pages 42-55  Pages 139-160
3. Students will use data to describe and communicate the results of scientific investigations.	<b>Earth Materials</b> Investigation 2 Part 2 <b>Human Body</b> Investigation 1 Part 1 <b>Ideas and Inventions</b> Investigation 2 Math Ext. Problem of the Week <b>Magnetism and Electricity</b> Investigation 1 Part 3 <b>Measurement</b>	Pages 14-21  Pages 8-15  Page 23  Pages 23-29

	<p>Investigation 4 Part 2  <b>Physics of Sound</b>  Investigation 2 Parts 1-3  <i>Physics of Sound FOSS Science Stories</i>  <b>Structures of Life</b>  Investigation 3 Part 4  <b>Water</b>  Investigation 3 Part 3  <b>Sun, Moon and Stars</b>  Investigation 1 Part 2  <b>Matter and Energy</b>  Investigation 3 Part 2</p>	<p>Pages 14-15  Pages 8-24  Pages 19-20  Pages 24-30  Pages 17-20  Pages 56-64  Pages 139-150</p>
<p>4. Students will use models that illustrate simple concepts and compare those models to the actual phenomenon.</p>	<p><b>Earth Materials</b>  Investigation 1 Parts 1-2  <b>Human Body</b>  Investigation 3 Parts 1-3  <i>Human Body FOSS Science Stories</i>  <b>Ideas and Inventions</b>  Investigation 2 Part 1  <i>Ideas and Inventions FOSS Science Stories</i>  <b>Magnetism and Electricity</b>  Investigation 2 Parts 1-2  <i>Magnetism and Electricity FOSS Science Stories</i>  <b>Measurement</b>  Investigation 1 Part 1  <b>Physics of Sound</b>  Investigation 3 Part 1  <i>Physics of Sound FOSS Science Stories</i>  <b>Structures of Life</b>  Investigation 3 Part 2  <b>Water</b>  Investigation 2 Part 1  <b>Sun, Moon and Stars</b>  Investigation 2 Part 2  <b>Matter and Energy</b>  Investigation 4 Part 2  <i>Matter and Energy FOSS Science Resources</i></p>	<p>Pages 8-23  Pages 8-21  Pages 12-13  Pages 8-15  Pages 14, 32, 36  Page 8-19  Pages 5, 9, 33  Pages 8-15  Pages 8-14  Pages 17-18  Pages 16-19  Pages 8-13  Pages 89-100  Pages 181-192  Pages 57-59</p>
<p>5. Students will identify a valid test in an investigation.</p>	<p><b>Earth Materials</b>  Investigation 3 Parts 1-2  <b>Human Body</b>  Investigation 4 Parts 1-3  <b>Ideas and Inventions</b>  Investigation 3 Part 2  <b>Magnetism and Electricity</b>  Investigation 2 Part 3  <b>Measurement</b>  Investigation 2 Part 3  <b>Structures of Life</b>  Investigation 4/5 Part 3  <b>Water</b>  Investigation 4 Part 1  <b>Sun, Moon and Stars</b>  Investigation 1 Part 1  <b>Matter and Energy</b>  Investigation 3 Part 2</p>	<p>Pages 8-19  Pages 8-24  Pages 14-17  Pages 20-25  Pages 18-21  Pages 20-24  Pages 8-13  Pages 42-55  Pages 139-150</p>
<p>6. Students will identify how observations of nature form an essential base of knowledge among the Montana American Indians.</p>	<p>Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations</p>	<p>Page 19</p>

	in FOSS and local environments and customs. <b>Earth Materials</b> Investigation 4 Language Extension 2 <i>Earth Materials FOSS Science Stories</i> <b>Ideas and Inventions</b> Investigation 3 Science Extension 3 <b>Magnetism and Electricity</b> Investigation 2 Social Studies Extension 2	Page 19 <i>Pages 16-19</i>  Page 24  Page 32
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## **Science Content Standard 2**

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will create mixtures and separate them based on different physical properties (e.g., salt and sand, iron filings and soil, oil and water).	<b>Earth Materials</b> Investigation 1 Parts 2-3 <b>Magnetism and Electricity</b> Investigation 1 Part 1 <b>Structures of Life</b> Investigation 1 Part 1 <b>Water</b> Investigation 4 Parts 1, 3	Pages 16-29  Pages 8-17  Pages 8-17  Pages 8-13, 19-23
2. Students will examine, measure, describe, compare and classify objects in terms of common physical properties.	<b>Earth Materials</b> Investigation 2 Parts 1-2 <i>Earth Materials FOSS Science Stories</i> <b>Human Body</b> Investigation 1 Part 3 <b>Ideas and Inventions</b> Investigation 1 Part 2 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 1 Parts 1-2 <b>Measurement</b> Investigation 2 Science Extension 3 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 1 Parts 1-2 <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 1 Part 1 <b>Water</b> Investigation 1 Parts 1-2 <b>Matter and Energy</b> Investigation 3 Part 1 <i>Matter and Energy FOSS Science Resources</i>	Pages 8-21 Pages 30-33, 37  Pages 21-25  Pages 14-17 Pages 4-7, 11-14  Pages 8-22  Page 24 Pages 30-33  Pages 8-20 Pages 19-20  Pages 8-17  Pages 8-18  Pages 129-138 Pages 39-42
3. Students will identify the basic characteristics of light, heat, motion, magnetism, electricity and sound.	<b>Ideas and Inventions</b> Investigation 4 Parts 1-2 (light) <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 1 Parts 1-4 (magnetism) Investigation 2 Parts 1-4 (electricity) <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 4 Parts 1-2 (heat) <b>Physics of Sound</b> Investigation 1 Part 3 (motion) Investigation 2 Parts 1-3 (sound) Investigation 3 Parts 1-2 (sound) <i>Physics of Sound FOSS Science Stories</i> <b>Water</b> Investigation 2 Parts 1-3 (heat)	Pages 8-17 Pages 28-31  Pages 8-34 Pages 8-29 Pages 6-11, 32-33  Pages 8-17  Pages 21-29 Pages 8-24 Pages 8-19 P 11-14, 17-21, 25-27  Pages 8-24

	<i>Water FOSS Science Stories</i> <b>Matter and Energy</b> Investigation 1 Parts 1, 3 Investigation 2 Parts 1-2 <i>Matter and Energy FOSS Science Resources</i>	Pages 5-7, 15-16  Pages 50-62, 71-82 Pages 93-114 Pages 24-36
4. Students will model and explain that matter exists as solids, liquids, and gases and can change from one form to another.	<b>Earth Materials</b> Investigation 1 Part 3 <i>Measurement FOSS Science Stories</i> <b>Water</b> Investigation 2 Part 3 Investigation 3 Parts 1-4 <i>Water FOSS Science Stories</i> <b>Matter and Energy</b> Investigation 4 Parts 1-2 <i>Matter and Energy FOSS Science Resources</i>	Pages 24-29 Pages 32-33  Pages 19-24 Pages 8-26 Pages 13, 14-16  Pages 174-192 Pages 39-42, 54-56
5. Students will identify that the position of an object can be described by its location relative to another object and its motions described, and measured by external forces action upon it.	<b>Magnetism and Electricity</b> Investigation 1 Part 3 <b>Measurement</b> Investigation 4 Part 1 <b>Water</b> Investigation 1 Part 3	Pages 23-29  Pages 8-13  Pages 19-23
6. Students will identify, build, and describe mechanical systems and the forces acting within those systems.	<b>Water</b> Investigation 4 Part 2 <b>Earth Materials</b> Investigation 3 Science Extension 1 <b>Human Body</b> Investigation 3 Parts 1-3 <b>Ideas and Inventions</b> Investigation 4 Parts 1-2 <b>Magnetism and Electricity</b> Investigation 2 Part 2 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 2 Parts 1-3	Pages 14-18  Page 24  Pages 8-21  Pages 8-17  Pages 14-19 Pages 5, 28-31  Pages 8-24
7. Students will observe, measure and manipulate forms of energy: sound, light, heat, electric, magnets	<b>Ideas and Inventions</b> Investigation 4 Parts 1-2 (light) <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 1 Parts 1-4 (magnetism) Investigation 2 Parts 1-4 (electricity) <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 4 Parts 1-2 (heat) <b>Physics of Sound</b> Investigation 1 Part 3 (motion) Investigation 2 Parts 1-3 (sound) Investigation 3 Parts 1-2 (sound) <i>Physics of Sound FOSS Science Stories</i> <b>Water</b> Investigation 2 Parts 1-3 (heat) <i>Water FOSS Science Stories</i> <b>Matter and Energy</b> Investigation 1 Parts 1, 3 Investigation 2 Parts 1-2 <i>Matter and Energy FOSS Science Resources</i>	Pages 8-17 Pages 28-31  Pages 8-34 Pages 8-29 Pages 6-11, 32-33  Pages 8-17  Pages 21-29 Pages 8-24 Pages 8-19 P 11-14, 17-21, 25-27  Pages 8-24 Pages 5-7, 15-16  Pages 50-62, 71-82 Pages 93-114 Pages 24-36

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will identify that plants and animals have structures and systems that serve different functions for growth, survival, and reproduction.	This standard is a primary focus of the life science kits designed for Grades 3-4. See for example: <b>Human Body</b> Investigation 2 Part 4 <i>Human Body FOSS Science Stories</i> <b>Physics of Sound</b> <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 2 Part 1 (plant structures) Investigation 3 Part 1 (animal structures) <i>Structures of Life FOSS Science Stories</i>	Pages 23-25 Pages 1-4,8-16,28-29 Pages 7-10  Pages 8-13 Pages 8-15 Pages 2, 17, 41-42
2. Students will identify, measure, and describe basic requirements of energy and nutritional needs for an organism.	<b>Structures of Life</b> Investigation 2 Parts 2-3 Investigation 3 Parts 2-4 <i>Structures of Life FOSS Science Stories</i> <b>Water</b> <i>FOSS Science Stories</i>	Pages 14-22 Pages 16-30 Pages 10-16, 43 Pages 5-7
3. Students will describe and use models that trace the life cycles of different plants and animals and discuss how they differ from species to species.	<b>Structures of Life</b> Investigation 2 Part 3 <a href="http://www.fossweb.com">www.fossweb.com</a> "Life Cycles" Activity <i>Structures of Life FOSS Science Stories</i>  [Note: This benchmark is addressed in the grades 2 and 3 essential learning expectations]	Pages 18-22  Pages 20-21, 40
4. Students will explain cause and effect relationships between nonliving and living components within ecosystems; and explain individual response to the changes in the environment including identifying differences between inherited, instinctual, and learned behaviors.	<b>Human Body</b> <i>FOSS Science Stories</i> <b>Physics of Sound</b> <i>FOSS Science Stories</i> <b>Structures of Life</b> Investigation 3 Parts 3-4 <i>Structures of Life FOSS Science Stories</i> <b>Water</b> <i>FOSS Science Stories</i>	Pages 17-20 Page 21  Pages 20-30 Pages 6-9, 22-36 Pages 5-7, 24-26
5. Students will create and use a classification system to group a variety of plants and animals according to their similarities and differences.	<b>Physics of Sound</b> <i>FOSS Science Stories</i> <b>Structures of Life</b> Investigations 4 & 5 Part 2 <i>Structures of Life FOSS Science Stories</i>	Pages 7-8  Pages 13/14-24 Pages 41-42

### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe and give examples of Earth's changing features.	<b>Earth Materials</b> Investigation 3 Science Extension 1 <i>Earth Materials FOSS Science Stories</i> <b>Water</b> Investigation 1 Science Extension 1 <i>Water FOSS Science Stories</i>	Page 24 Pages 1-7  Page 27 Pages 8-9, 22-23
2. Students will describe and measure the physical properties of Earth's basic materials (including soil, rocks, water and gases) and the	<b>Earth Materials</b> Investigation 1 Parts 1-3 <i>Earth Materials FOSS Science Stories</i> <b>Measurement</b> Investigation 2 Science Extensions 1-2	Pages 8-29 Pages 12-13, 24-33  Pages 23-24

resources they provide.	<i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 3 Parts 1-2 <b>Water</b> Investigation 3 Parts 1-4	Pages 30-33  Pages 8-19  Pages 8-26
3. Students will investigate fossils and make inferences about life the plants, animals, and the environment at that time.	<b>Earth Materials</b> <i>FOSS Science Stories</i> <b>Human Body</b> <i>FOSS Science Stories</i> <b>Structures of Life</b> <i>FOSS Science Stories</i>	Pages 1-4 Pages 21-24 Pages 45-48
4. Students will observe and describe the water cycle and the local weather and demonstrate how weather conditions are measured.	<b>Water</b> Investigation 3 Part 4 <i>Water FOSS Science Stories</i>	Pages 21-26 Pages 14-16
5. Students will identify seasons and explain the difference between weather and climate.	[ <b>Note:</b> This benchmark is addressed in the grade 3 essential learning expectations]	
6. Students will identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the Sun.	<b>Ideas and Inventions</b> Teacher Guide Supplement Activities <i>Ideas and Inventions FOSS Science Stories</i> <b>Physics of Sound</b> <i>FOSS Science Stories</i> <b>Sun, Moon and Stars</b> Investigation 1 Parts 1-2 Investigation 2 Parts 1-2 Investigation 3 Parts 1-2 <i>Sun, Moon and Stars FOSS Science Resources</i>	Pages 1-8 Pages 33-37 Page 22  Pages 42-64 Pages 79-100 Pages 114-130 Pages 1-38
7. Students will identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes).	<b>Human Body</b> <i>FOSS Science Stories</i> <b>Measurement</b> <i>FOSS Science Stories</i> <b>Water</b> <i>FOSS Science Stories</i> <b>Ideas and Inventions</b> <i>FOSS Science Stories</i> <b>Sun, Moon and Stars</b> <i>FOSS Science Resources</i>  [ <b>Note:</b> This benchmark is addressed in the grades 1 and 3 essential learning expectations]	Pages 17-20 Pages 14-15 Pages 27-29 Pages 33-37 Pages 40-43

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe and discuss examples of how people use science and technology.	<b>Earth Materials</b> Investigation 1 Science Extensions 4, 5 <i>Earth Materials FOSS Science Stories</i> <b>Human Body</b> Investigation 2 Language Extension 2 <i>Human Body FOSS Science Stories</i> <b>Ideas and Inventions</b> Investigation 2 Part 2 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 2 Parts 1-3 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 1 Part 1 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 1 Part 2 <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b>	Page 32 Pages 12-13, 24-29  Page 26 Pages 5-7, 17-27  Pages 16-19 Pages 1-3, 11-14, 17  Page 8-25 Pages 5, 14, 28-33  Pages 8-15 P 11-15, 18-19, 22-29  Pages 16-20 Pages 21, 25-36

	<p>Investigation 2 Science Extension 2 <i>Structures of Life FOSS Science Stories</i> <b>Water</b> Investigation 2 Part 1 <i>Water FOSS Science Stories</i> <b>Sun, Moon and Stars FOSS Science Resources</b></p>	<p>Page 2 Pages 10-11</p> <p>Pages 8-13 Pages 10-11, 17-26 Pages 40-43</p>
<p>2. Students will describe a scientific or technological innovation that impacts communities, cultures, and societies.</p>	<p><b>Earth Materials</b> Investigation 1 Science Extensions 3, 4 <i>Earth Materials FOSS Science Stories</i> <b>Human Body</b> Investigation 2 Language Extension 4 <i>Human Body FOSS Science Stories</i> <b>Ideas and Inventions</b> Investigation 1 Language Extension 4 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 2 Parts 1-3 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 1 Part 1 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 4 Social Studies Extension <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life</b> Investigation 1 Social Studies Extension <i>Structures of Life FOSS Science Stories</i> <b>Water</b> Investigation 3 Social Studies Extension <i>Water FOSS Science Stories</i> <b>Sun, Moon and Stars FOSS Science Resources</b></p>	<p>Page 24 Pages 8-9, 12-13</p> <p>Page 26 Pages 5-7</p> <p>Page 22 P 9-10, 17-18, 21-22</p> <p>Page 8-25 Pgs 14, 16-19, 24-37</p> <p>Pages 8-15 Pgs 5-6, 11-15, 18-20</p> <p>Page 23 Pages 29-31, 32-36</p> <p>Page 35 Pages 6-9</p> <p>Page 28 Pages 18-23, 24-26 Pages 40-43</p>
<p>3. Students will simulate scientific collaboration by sharing and communicating ideas to identify and describe problems.</p>	<p>Students share and communicate findings and ideas throughout all FOSS investigations, both in the course of hands-on investigations and in the lesson wrap-up. This skill is explicitly written into all FOSS lesson plans.</p> <p><b>Earth Materials</b> Investigation 3 Part 2 <b>Human Body</b> Investigation 4 Part 1 <b>Ideas and Inventions</b> Investigation 3 Part 3 <b>Magnetism and Electricity</b> Investigation 3 Part 3 <b>Measurement</b> Investigation 3 Part 3 <b>Physics of Sound</b> Investigation 4 Part 1 <b>Water</b> Investigation 4 Part 2 <b>Sun, Moon and Stars</b> Investigation 1 Parts 1-2 <b>Matter and Energy</b> Investigation 3 Part 2</p>	<p>Pages 14-19</p> <p>Pages 8-16</p> <p>Pages 18-21</p> <p>Pages 22-26</p> <p>Page 18-21</p> <p>Pages 6-15</p> <p>Pages 14-18</p> <p>Pages 42-64</p> <p>Pages 139-150</p>
<p>4. Students will use scientific knowledge to make inferences and propose solutions for simple environmental problems.</p>	<p><b>Measurement</b> Investigation 2 Science Extension 3 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 2 Music Extension 3 <i>Structures of Life FOSS Science Stories</i> <b>Water</b></p>	<p>Page 24 Pages 15, 16-17</p> <p>Page 27 Pages 35-36</p>

	Investigation 4 Science Extensions 1, 2 <i>Water FOSS Science Stories</i>	Page 31 Pages 17, 21
5. Students will identify how the knowledge of science and technology influences the development of the Montana American cultures.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will easily make between science and technology studied in FOSS and local technology and cultures. <b>Earth Materials</b> Investigation 4 Language Extension 2 <b>Ideas and Inventions</b> Investigation 3 Science Extension 3 <b>Magnetism and Electricity</b> Investigation 2 Social Studies Extension 2	Page 19 Page 24 Page 32

### **Science Content Standard 6**

Students understand historical developments in science and technology.

<b>BENCHMARKS</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will give historical examples of scientific and technological contributions to communities, cultures and societies, including Montana American Indian examples.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations and end of module projects. It can also be addressed through connections that Montana teachers will easily make between history of science and technology examples studied in FOSS and local history, technology and cultures. <b>Earth Materials</b> Investigation 4 Language Extension 2 <i>Earth Materials FOSS Science Stories</i> <b>Human Body FOSS Science Stories</b> <b>Ideas and Inventions</b> Investigation 3 Science Extension 3 <i>Ideas and Inventions FOSS Science Stories</i> <b>Magnetism and Electricity</b> Investigation 2 Social Studies Extension 2 <i>Magnetism and Electricity FOSS Science Stories</i> <b>Measurement</b> Investigation 1 Language Extension 2 <i>Measurement FOSS Science Stories</i> <b>Physics of Sound</b> Investigation 4 Social Studies Extension <i>Physics of Sound FOSS Science Stories</i> <b>Structures of Life FOSS Science Stories</b> <i>Water FOSS Science Stories</i> <b>Sun, Moon and Stars FOSS Science Resources</b>	Page 19 Pages 8-9, 24-29 Pages 21-24 Page 24 P 9-10, 17-18, 21-22 Page 32 Pages 12-27, 34-37 Page 25 P 5-6, 8-9, 11-13, 21 Page 23 Page 14 Pages 12-16 Pages 10-11, 22-26 Page 40
2. Students will describe how scientific inquiry has produced much knowledge about the world and a variety of contributions toward understanding events and phenomenon within the universe.	<b>Earth Materials FOSS Science Stories</b> <b>Human Body FOSS Science Stories</b> <b>Ideas and Inventions FOSS Science Stories</b> <b>Magnetism and Electricity FOSS Science Stories</b> <b>Measurement FOSS Science Stories</b> <b>Structures of Life FOSS Science Stories</b> <b>Water FOSS Science Stories</b> <b>Sun, Moon and Stars FOSS Science Resources</b>	Pages 1-7, 8-11 Pages 17-24 Pages 9, 11-16, 23-27 Pages 12-13, 16-23, 34-37 Pages 30-31 Pages 12-16 Pages 24-26 Pages 40-45
3. Students will describe science as a human endeavor and an ongoing process.	<b>Earth Materials FOSS Science Stories</b> <b>Human Body FOSS Science Stories</b> <b>Ideas and Inventions FOSS Science Stories</b> <b>Magnetism and Electricity FOSS Science</b>	Pages 1-7, Pages 17-24 Pages 9, 11-16, 23-27 Pages 12-13, 16-23,

	<i>Stories</i> <b>Measurement</b> FOSS Science Stories  <b>Physics of Sound</b> FOSS Science Stories <b>Structures of Life</b> FOSS Science Stories <b>Water</b> FOSS Science Stories <b>Sun, Moon and Stars</b> FOSS Science Resources	34-37 Pages 5-6,8-9,11-13, 30-31 Pages 29-31 Pgs 6-9, 10-11, 12-16 Pages 17, 21, 27-29 Pages 40-45
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# End of Grade Eight Benchmarks Grade Five

## Science Content Standard 1

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will identify a question, determine relevant variables and a control, formulate a testable hypothesis, plan and predict the outcome of an investigation, safely conduct scientific investigation, and compare and analyze data.	<b>Variables ALL, such as</b> Investigation 4 Part 3 <b>Environments</b> Investigation 6 Parts 1-3 <b>Landforms</b> Investigation 3 Part 3 <b>Mixtures and Solutions</b> Investigation 3 Part 3 <b>Models and Designs</b> Investigation 4 Parts 1-2 <b>Solar Energy</b> Investigation 4 Part 3 <b>Living Systems</b> Investigation 3 Part 3 <b>Water Planet</b> Investigation 2 Parts 2-3	Pages 18-23  Pages 8-22  Pages 20-24  Pages 21-24  Pages 6-15  Pages 24-28  Pages 136-141  Pages 86-100
2. Students will select and use appropriate tools including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations.	<b>Environments</b> Investigation 3 Parts 1-3 <b>Food and Nutrition</b> Investigation 2 Part 2 <b>Living Systems</b> Investigation 2 Part 1 Investigation 3 Parts 2-3 <b>Water Planet</b> Investigation 3 Part 1 <b>Landforms</b> Investigation 1 Parts 1-3 <b>Levers and Pulleys</b> Investigation 4 Part 2 <b>Mixtures and Solutions</b> Investigation 2 Parts 1-3 <b>Models and Designs</b> Investigation 3 Part 3 <b>Solar Energy</b> Investigation 3 Parts 1-2 <b>Variables</b> Investigation 2 Parts 1-3 <i>Note that ALL FOSS investigations beginning with Grade 3 on use metric units, with the exception of the USGS maps in Landforms.</i>	Pages 8-22  Pages 18-21  Pages 85-98 Pages 126-141  Pages 125-135  Pages 8-24  Pages 14-20  Pages 8-25  Page 20-23  Pages 8-23  Pages 8-23
3. Students will review, communicate and defend results of investigations including considering alternative explanations.	Communicating and defending statements with evidence occurs in all FOSS investigations, especially in the end of lesson discussion. <b>Environments</b> Investigation 5 Science Extension 2 <b>Landforms</b> Investigation 3 Part 3 <b>Mixtures and Solutions</b> Investigation 3 Part 3 <b>Living Systems</b> Investigation 3 Parts 2-3	Page 24  Pages 20-24  Pages 21-24  Pages 126-141

	<b>Water Planet</b> Investigation 2 Parts 2-3 <b>Models and Designs</b> Investigation 4 Parts 1-2 <b>Solar Energy</b> Investigation 4 Part 3 <b>Variables</b> Investigation 4 Part 3	Pages 86-100  Pages 6-15  Pages 24-28  Pages 18-23
4. Students will create models to illustrate scientific concepts and use the models to predict change. (e.g., computer simulation, stream tables, graphic representation)	<b>Models and Designs</b> throughout, such as Investigation 1 Parts 1-3 <i>Models and Designs FOSS Science Stories</i> <b>Environments</b> Investigation 4 Part 3 <i>Environments FOSS Science Stories</i> <b>Food and Nutrition</b> Investigation 4 Part 1 <i>Food and Nutrition FOSS Science Stories</i> <b>Landforms</b> throughout, such as Investigation 1 Parts 1-3 Investigation 4 Parts 1-3 <i>Landforms FOSS Science Stories</i> <b>Living Systems</b> Investigation 3 Part 1 <b>Water Planet</b> Investigation 1 Part 1 <b>Levers and Pulleys</b> Investigation 2 Parts 1-4 <i>Levers and Pulleys FOSS Science Stories</i> <b>Mixtures and Solutions</b> <i>FOSS Science Stories</i> <b>Solar Energy</b> throughout, such as Investigation 4 Parts 1-3 <b>Variables</b> Investigation 2 Parts 1-3	Pages 8-25 Pages 2-3, 5-10  Pages 19-24 Pages 41, 44-45  Page 8-15 Page 4  Pages 8-24 Pages 8-24 Pages 33-34  Pages 118-125  Pages 50-58  Pages 8-25 Pages 5, 17 Pages 32-36  Pages 8-28  Pages 8-23
5. Students will identify strengths and weaknesses in investigation design.	<b>Environments</b> Investigation 2 Parts 2-3 <b>Food and Nutrition</b> Investigation 2 Part 1 <b>Mixtures and Solutions</b> Investigation 2 Part 1 <b>Models and Designs</b> Investigation 3 Part 3 <b>Solar Energy</b> Investigation 4 Parts 1-3 <b>Variables</b> Investigation 3 Parts 1-3 <b>Living Systems</b> Investigation 3 Part 3 <b>Water Planet</b> Investigation 3 Part 1	Pages 16-25  Pages 8-17  Pages 8-15  Pages 20-23  Pages 8-28  Pages 8-23  Pages 136-141  Pages 125-135
6. Students will identify how observations of nature form an essential base of knowledge among the Montana American Indians.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and natural history. <i>Landforms FOSS Science Stories</i> <b>Solar Energy</b> Investigation 1 Language Extension 1	Pages 43-44  Page 22

## Science Content Standard 2

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

BENCHMARKS	FOSS INVESTIGATIONS (*available soon)	PAGE NUMBERS
1. Students will classify, describe, and manipulate the physical models of matter in terms of: elements, and compounds, pure substances and mixtures, atoms and molecules.	<b>Mixtures and Solutions</b> Investigation 1 Part 1 <i>Mixtures and Solutions FOSS Science Stories</i> <b>Solar Energy</b> <i>FOSS Science Stories</i>	Pages 8-15 Pages 25-28, 32-42 Pages 18-20
2. Students will examine, describe, compare and classify objects and substances based on common physical properties and simple chemical properties.	<b>Environments</b> Investigation 4 Part 2 <b>Food and Nutrition</b> Investigation 1 Part 2 <i>Food and Nutrition FOSS Science Stories</i> <b>Mixtures and Solutions</b> Investigation 1 Parts 1-4 <i>Mixtures and Solutions FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Part 2 <b>Living Systems</b> Investigation 3 Part 3 <b>Water Planet</b> Investigation 3 Part 1	Pages 13-18  Pages 16-20 Pages 1-4, 14  Pages 8-29 Pages 37-42  Pages 16-24  Pages 136-141  Pages 125-135
3. Students will describe energy and compare and contrast the energy transformations and the characteristics of light, heat, motion, magnetism, electricity, sound and mechanical waves.	<b>Environments</b> <i>FOSS Science Stories</i> <b>Food and Nutrition</b> <i>FOSS Science Stories</i> <b>Models and Designs</b> Investigation 3 Science Extension 3 <i>Models and Designs FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Part 1 <i>Solar Energy FOSS Science Stories</i> <a href="http://www.fossweb.com">www.fossweb.com</a> <i>Solar Energy</i> <b>Living Systems</b> Investigation 3 Part 1 <i>Living Systems FOSS Science Resources</i>	Page 39 Page 43  Page 26 Pages 4, 40-43  Pages 8-15 Pages 1-3, 16  Pages 118-123 Pages 31-34, 47-48
4. Students will model and explain the states of matter are dependent upon the quantity of energy present in the system and describe what will change and what will remain unchanged at the particulate level when matter experiences an external force or energy change.	<b>Mixtures and Solutions</b> Investigation 4 Part 1 <b>Solar Energy</b> <i>FOSS Science Stories</i> <b>Water Planet</b> Investigation 2 Parts 1, 4 <i>Water Planet FOSS Science Resources</i>  [ <b>Note:</b> This benchmark is addressed in the grades 6-8 essential learning expectations]	Pages 8-15 Pages 18-20  Pages 80-85, 101-110 Pages 28-30, 33-34
5. Students will describe and explain the motion of an object in terms of its position, direction, & speed as well as the forces acting upon it.	<i>Solar Energy FOSS Science Stories</i> <b>Landforms</b> Investigation 3 Parts 1-2 <i>Levers and Pulleys FOSS Science Stories</i> <i>Models and Designs FOSS Science Stories</i> <b>Variables</b> Investigation 3 Parts 1-4 <i>Variables FOSS Science Stories</i>	Pages 43-44  Pages 8-19 Pages 7-8 Pages 37-43  Pages 8-27 Pages 15-17
6. Students will identify, build, describe, measure, and analyze mechanical systems (e.g., simple and complex machines) and describe the	<b>Levers and Pulleys</b> Investigation 3 Parts 1-2 <i>Levers and Pulleys FOSS Science Stories</i> <b>Models and Designs</b> Investigation 3 Parts 1-2	Pages 8-20 Page 18  Pages 8-19

forces acting within those systems.	<b>Variables</b> Investigation 3 Parts 1-4  [ <b>Note:</b> This benchmark is addressed in the grades 6-8 essential learning expectations]	Pages 8-27
7. Students will give examples and describe how energy is transferred and conserved (e.g. electric to light and heat [light bulb], chemical to mechanical [fuel to propulsion]).	<b>Environments FOSS Science Stories</b> <b>Food and Nutrition</b> Investigation 2 Part 1 <i>Food and Nutrition FOSS Science Stories</i> <b>Living Systems</b> Investigation 3 Parts 1-2 <i>Living Systems FOSS Science Resources</i> <b>Models and Designs</b> Investigation 3 Science Extension 3 <i>Models and Designs FOSS Science Stories</i> <b>Solar Energy</b> Investigation 4 Parts 1-3 <i>Solar Energy FOSS Science Stories</i> <a href="http://www.fossweb.com">www.fossweb.com</a> <i>Solar Energy</i>  [ <b>Note:</b> This benchmark is addressed in the grades 6-8 essential learning expectations]	Page 39  Pages 8-17 Page 43  Pages 118-135 Pages 31-36, 47-48  Page 26 Page 25  Pages 8-28 Pages 1-3, 16-17

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will compare the structure and function of prokaryotic cells (bacteria) and eukaryotic cells (plant, animal, etc.) including the levels of organization of the structure and function, particularly with humans.	<b>Living Systems</b> Investigation 1 Parts 1-3 <i>Living Systems FOSS Science Resources</i>	Pages 51-70 Pages 2-13
2. Students will explain how organisms and systems of organisms obtain and use energy resources to maintain stable conditions (e.g., food webs, photosynthesis, respiration).	<b>Environments</b> <a href="http://www.fossweb.com">www.fossweb.com</a> Activities <i>Environments FOSS Science Stories</i> <b>Food and Nutrition FOSS Science Stories</b> <b>Solar Energy FOSS Science Stories</b> <b>Living Systems</b> Investigation 3 Parts 1-2 <i>Living Systems FOSS Science Resources</i>	“Virtual Aquarium” Page 39 Pages 6-9, 41-50 Page 1  Pages 118-135 Pages 31-36, 47-48
3. Students will communicate the differences in the reproductive processes of a variety of plants and animals using the principles of genetic modeling (e.g. Punnett squares).		
4. Students will investigate and explain the interdependent nature of populations and communities in the environment and describe how species in these populations adapt by evolving.	<b>Environments</b> Investigation 4 Part 3 <i>Environments FOSS Science Stories</i>	Pages 19-22 Pg 9-17, 27-45, 49-55
5. Students will create and use a basic classification scheme	<b>Environments FOSS Science Stories</b> <b>Living Systems</b>	Pages 18-22

to identify plants and animals.	Investigation 2 Part 2 <i>Living Systems FOSS Science Resources</i>	Pages 99-106 Pages 21-22
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### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will model and explain the internal structure of the Earth and describe the formation and composition of Earth's external features in terms of the rock cycle and plate tectonics and constructive and destructive forces.	<b>Landforms</b> Investigation 2 Parts 1-2 <i>Landforms FOSS Science Stories</i>	Pages 8-22 Pages 22-32
2. Students will differentiate between rock types and mineral types and classify both by how they are formed and the utilization by humans.		
3. Students will use fossils to describe the geological timeline.	<b>Models and Designs</b> <i>FOSS Science Stories</i>	Pages 11-16
4. Students will describe the water cycle, the composition and structure of the atmosphere and the impact of oceans on large-scale weather patterns.	<b>Solar Energy</b> <i>FOSS Science Stories</i> <b>Water Planet</b> Investigation 4 Parts 1-2 <i>Water Planet FOSS Science Resources</i>	Pages 2, 22-25 Pages 184-203 Pages 67-79
5. Students will describe and model the motion and tilt of Earth in relation to the Sun, and explain the concepts of day, night, seasons, year, and climatic changes.	<b>Models and Designs</b> Investigation 1 Language Extension <b>Water Planet</b> <i>FOSS Science Resources</i> <b>Solar Energy</b> Investigation 1 Science Extension 1 <i>Solar Energy FOSS Science Stories</i>	Page 26 Page 45 Page 24 Page 2
6. Students will describe the earth, moon, planets and other objects in space in terms of size, force of gravity, structure, and movement in relation to the Sun.	<b>Models and Designs</b> <i>FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Math Extension 1 <i>Solar Energy FOSS Science Stories</i> <b>Water Planet</b> Investigation 1 Parts 1-2 <i>Water Planet FOSS Science Resources</i>	Pages 5-9 Pages 26-27 Pages 40-43 Pages 50-56 Pages 1-17
7. Students will identify scientific theories about the origin and evolution of the earth and solar system.	<b>Models and Designs</b> <i>FOSS Science Stories</i>  [Note: This benchmark is addressed in the grades 6-8 essential learning expectations]	Pages 5-9

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe the specific fields of science and technology as they relate to occupations within those fields.	<b>Environments</b> <i>FOSS Science Stories</i> <b>Food and Nutrition</b> <i>FOSS Science Stories</i> <b>Landforms</b> Investigation 3/ Science Extension 4/1 <i>Landforms FOSS Science Stories</i> <b>Mixtures and Solutions</b> <i>FOSS Science Stories</i> <b>Models and Designs</b>	Pages 1-8 Pages 5, 9 Page 27 Pgs 5-6, 13-14, 19-21 Pages 29-31

	<p>Investigation 3 Language Extension <i>Models and Designs FOSS Science Stories</i> <i>Water Planet FOSS Science Resources</i></p> <p><b>Solar Energy</b> Investigation 2 Language Extension 2 <i>Solar Energy FOSS Science Stories</i> <b>Variables</b> <i>FOSS Science Stories</i></p>	<p>Page 24 Pages 17-20, 44-55 Pages 15, 18-19</p> <p>Page 25 Pages 4-5, 26-28 Pages 7, 24-28</p>
<p>2. Students will apply scientific knowledge and process skills to understand issues and everyday events.</p>	<p><b>Environments</b> Investigation 5 Language Extension <i>Environments FOSS Science Stories</i></p> <p><b>Food and Nutrition</b> Investigation 4 Part 1 <i>Food and Nutrition FOSS Science Stories</i></p> <p><b>Landforms</b> Investigation 2 Social Studies Extension 2 <i>Landforms FOSS Science Stories</i></p> <p><b>Levers and Pulleys</b> Investigation 3 Science Extension 2 <i>Levers and Pulleys FOSS Science Stories</i> <i>Water Planet FOSS Science Resources</i> <i>Living Systems FOSS Science Resources</i></p> <p><b>Mixtures and Solutions</b> Investigation 3 Science Extension 4 <i>Mixtures and Solutions FOSS Science Stories</i></p> <p><b>Models and Designs</b> Investigation 4 Science Extension 1 <i>Models and Designs FOSS Science Stories</i></p> <p><b>Solar Energy</b> Investigation 4 Part 3 <i>Solar Energy FOSS Science Stories</i></p> <p><b>Variables</b> Investigation 4 Science Extension 4 <i>Variables FOSS Science Stories</i></p>	<p>Page 23 Pages 23-26, 36-37</p> <p>Pages 8-15 Pages 27-29</p> <p>Page 24 Pages 13-21</p> <p>Page 28 Pages 7-9 Page 97 Page 52</p> <p>Page 28 Pages 23-28</p> <p>Page 23 Pages 48-55</p> <p>Pages 24-28 Pages 29-33, 35-37</p> <p>Page 32 Pages 34-37</p>
<p>3. Students will simulate collaborative problem solving and give examples of how scientific knowledge and technology are shared with other scientists and the public.</p>	<p><b>Environments</b> Investigation 6 Parts 1-3</p> <p><b>Landforms</b> Investigation 3 Part 3</p> <p><b>Levers and Pulleys</b> Investigation 3 Science Extension 1</p> <p><b>Mixtures and Solutions</b> Investigation 3 Part 3</p> <p><b>Models and Designs</b> Investigation 3 Part 2</p> <p><b>Solar Energy</b> Investigation 4 Part 3</p> <p><b>Water Planet</b> Investigation 3 Part 1</p> <p><b>Living Systems</b> Investigation 3 Part 3</p> <p><b>Variables</b> Investigation 4 Part 3</p> <p>[<b>Note:</b> This benchmark is addressed in the grades 6-8 essential learning expectations]</p>	<p>Pages 8-22</p> <p>Pages 20-24</p> <p>Page 28</p> <p>Pages 21-24</p> <p>Pages 13-19</p> <p>Pages 24-28</p> <p>Pages 125-135</p> <p>Pages 136-141</p> <p>Pages 18-23</p>
<p>4. Students will use scientific knowledge to investigate problems and their proposed solutions and evaluate those solutions while considering environmental impacts.</p>	<p><b>Environments</b> Investigation 5 Language Extension <i>Environments FOSS Science Stories</i></p> <p><b>Landforms</b> <i>FOSS Science Stories</i></p> <p><b>Mixtures and Solutions</b> <i>FOSS Science Stories</i></p> <p><b>Models and Designs</b> <i>FOSS Science Stories</i></p> <p><b>Solar Energy</b></p>	<p>Page 23 Pages 35-45, 49-52 Pages 13-14, 37-44 Pages 20-22 Pages 25-28</p>

	Investigation 4 Part 3 Solar Energy FOSS Science Stories	Pages 24-28 Pages 35-39
5. Students will describe how the knowledge of science and technology influences the development of the Montana American Indian cultures.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and natural history. <b>Landforms FOSS Science Stories</b> <b>Solar Energy</b> Investigation 1 Language Extension 1	Pages 43-44  Page 22

### **Science Content Standard 6**

Students understand historical developments in science and technology.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will give examples of scientific discoveries and describe the interrelationship between technological advances and scientific understanding, including Montana American Indian examples.	Though FOSS is a nation-wide curriculum, this standard is easily addressed as principles learned FOSS investigations are applied to local examples. Montana teachers will make connections between scientific and technological concepts in FOSS and local environments and natural history. <b>Environments</b> Investigation 6 Science Extension 1 <i>Environments FOSS Science Stories</i> <b>Food and Nutrition</b> Investigation 2 Science Extension 3 <i>Food and Nutrition FOSS Science Stories</i> <b>Landforms FOSS Science Stories</b> <b>Levers and Pulleys FOSS Science Stories</b> <b>Mixtures and Solutions FOSS Science Stories</b> <b>Water Planet FOSS Science Resources</b> <b>Models and Designs</b> Investigation 4 Language Extension 1 <i>Models and Designs FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Social Studies Extension 2 <i>Solar Energy FOSS Science Stories</i> <b>Variables</b> Investigation 1 Language Extension 3 <i>Variables FOSS Science Stories</i>	Page 24 Pages 43-48  Page 28 Pages 26, 34-36 Pages 10-12 Pages 1-4 Pages 5, 8-10 Pages 15, 96  Page 21 Pages 5-10  Page 25 Pgs 4-5, 12-15, 29-31  Page 28 Pages 15-28
2. Students will identify major milestones in science that have impacted science, technology and society.	<b>Environments FOSS Science Stories</b> <b>Food and Nutrition FOSS Science Stories</b> <b>Landforms FOSS Science Stories</b> <b>Levers and Pulleys FOSS Science Stories</b> <b>Mixtures and Solutions FOSS Science Stories</b> <b>Water Planet FOSS Science Resources</b> <b>Models and Designs</b> Investigation 4 Language Extension 1 <i>Models and Designs FOSS Science Stories</i> <i>Solar Energy FOSS Science Stories</i> <b>Variables</b> Investigation 3 Language Extension 2 <i>Variables FOSS Science Stories</i>	Pages 47-48 Pages 26, 34-36 Pages 11-12, 13-14 Pages 1-4, 7-9 Pages 5, 8-10 Pages 18-19, 96  Page 21 Pages 5-10 Page 34  Page 29 Pages 15-28
3. Students will describe and explain science as a human endeavor and an ongoing process.	<b>Environments</b> Investigation 6 Language Extensions 1, 2 <i>Environments FOSS Science Stories</i> <b>Food and Nutrition</b>	Page 23 Pages 27-37

	<p>Investigation 4 Part 1  <i>Food and Nutrition FOSS Science Stories</i>  <b>Water Planet</b> <i>FOSS Science Resources</i>  <b>Landforms</b>  Investigation 3 Science Extension 4  <i>Landforms FOSS Science Stories</i>  <i>Levers and Pulleys FOSS Science Stories</i>  <b>Mixtures and Solutions</b>  Investigation 1 Science Extension 3  <i>Mixtures and Solutions FOSS Science Stories</i>  <b>Models and Designs</b>  Investigation 4 Parts 1-2  <i>Models and Designs FOSS Science Stories</i>  <b>Solar Energy</b>  Investigation 3 Social Studies Extension 2  <i>Solar Energy FOSS Science Stories</i>  <b>Variables</b>  Investigation 3 Language Extension 2  <i>Variables FOSS Science Stories</i></p>	<p>Pages 8-15  Pages 37-40  Pages 15, 18-19, 96</p> <p>Page 27  Pages 35-36  Pages 1-4, 7-9</p> <p>Page 31  Pages 20-22, 43-45</p> <p>Pages 6-15  Pages 17-20</p> <p>Page 26  Pages 29-39</p> <p>Page 29  Pages 18-20</p>
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# End of Grade Eight Benchmarks Grades 6-8

The Grade 8 standards and benchmarks are addressed through investigations in both K-6 FOSS (Grades 5-6 kits) and FOSS Middle School, designed for Grades 6-8. *Representative* examples from both programs are cited below, generally with the Grades 5-6 kits listed first, followed by those from FOSS Middle School. Please note that the citations listed are examples and do not represent ALL investigations that meet a particular standard or benchmark.

## **Science Content Standard 1**

Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will identify a question, determine relevant variables and a control, formulate a testable hypothesis, plan and predict the outcome of an investigation, safely conduct scientific investigation, and compare and analyze data.	<b>Variables ALL, such as</b> Investigation 4 Part 3	Pages 18-23
	<b>Environments</b> Investigation 6 Parts 1-3	Pages 8-22
	<b>Landforms</b> Investigation 3 Part 3	Pages 20-24
	<b>Mixtures and Solutions</b> Investigation 3 Part 3	Pages 21-24
	<b>Models and Designs</b> Investigation 4 Parts 1-2	Pages 6-15
	<b>Solar Energy</b> Investigation 4 Part 3	Pages 24-28
	<b>Living Systems</b> Investigation 3 Part 3	Pages 136-141
	<b>Water Planet</b> Investigation 2 Parts 2-3	Pages 86-100
	<b>Diversity of Life</b> Investigation 6 Parts 1-3	Pages 186-203
	<b>Earth History</b> Investigation 8 Part 2	Pages 259-165
	<b>Electronics</b> Investigation 5 Part 2 <i>Electronics CD-ROM</i>	Pages 166-170
	<b>Force and Motion</b> Investigation 5 Part 2 <i>Force and Motion CD-ROM</i>	Pages 177-186
	<b>Human Brain and Senses</b> Investigation 7 Part 2 <i>Human Brain and Senses CD-ROM</i>	Pages 219-226
	<b>Planetary Science</b> Investigation 5 Parts 1-4	Pages 154-173
	<b>Populations and Ecosystems</b> Investigation 6 Parts 1-3 <i>Populations and Ecosystems CD-ROM</i>	Pages 179-198
	<b>Weather and Water</b> Investigation 8 Part 1	Pages 258-264
	<b>Chemical Interactions</b> Investigation 1 Parts 1-2 <i>Chemical Interactions CD-ROM</i>	Pages 44-58
2. Students will select and use appropriate tools	<b>Environments</b> Investigation 3 Parts 1-3	Pages 8-22

<p>including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations.</p>	<p><b>Food and Nutrition</b> Investigation 2 Part 2</p> <p><b>Living Systems</b> Investigation 2 Part 1 Investigation 3 Parts 2-3</p> <p><b>Water Planet</b> Investigation 3 Part 1</p> <p><b>Landforms</b> Investigation 1 Parts 1-3</p> <p><b>Levers and Pulleys</b> Investigation 4 Part 2</p> <p><b>Mixtures and Solutions</b> Investigation 2 Parts 1-3</p> <p><b>Models and Designs</b> Investigation 3 Part 3</p> <p><b>Solar Energy</b> Investigation 3 Parts 1-2</p> <p><b>Variables</b> Investigation 2 Parts 1-3 <i>Note that ALL FOSS Middle School courses have CD-ROMS which students use to gather, process and analyze data as appropriate. This is in addition to the data gathered in the hands-on investigations in the module.</i></p> <p><b>Diversity of Life</b> Investigation 6 Part 1</p> <p><b>Electronics</b> Investigation 7 Part 3</p> <p><b>Force and Motion</b> Investigation 6 Parts 1-3</p> <p><b>Human Brain and Senses</b> Investigation 4 Parts 1-3</p> <p><b>Planetary Science</b> Investigation 5 Part 3</p> <p><b>Populations and Ecosystems</b> Investigation 6 Parts 1-3</p> <p><b>Weather and Water</b> Investigation 8 Part 3</p> <p><b>Chemical Interactions</b> Investigation 10 Parts 1-2 <i>Note that ALL FOSS investigations beginning with Grade 3 on use metric units, with the exception of the USGS maps in Landforms.</i></p>	<p>Pages 18-21</p> <p>Pages 85-98 Pages 126-141</p> <p>Pages 125-135</p> <p>Pages 8-24</p> <p>Pages 14-20</p> <p>Pages 8-25</p> <p>Page 20-23</p> <p>Pages 8-23</p> <p>Pages 8-23</p> <p>Pages 186-192</p> <p>Pages 231-237</p> <p>Pages 218-241</p> <p>Pages 120-143</p> <p>Pages 164-167</p> <p>Pages 179-198</p> <p>Pages 271-275</p> <p>Pages 325-336</p>
<p>3. Students will review, communicate and defend results of investigations including considering alternative explanations.</p>	<p>Communicating and defending statements with evidence occurs in all FOSS investigations, especially in the end of lesson discussion.</p> <p><b>Environments</b> Investigation 5 Science Extension 2</p> <p><b>Landforms</b> Investigation 3 Part 3</p> <p><b>Mixtures and Solutions</b> Investigation 3 Part 3</p> <p><b>Living Systems</b> Investigation 3 Parts 2-3</p> <p><b>Water Planet</b> Investigation 2 Parts 2-3</p> <p><b>Models and Designs</b> Investigation 4 Parts 1-2</p> <p><b>Solar Energy</b> Investigation 4 Part 3</p> <p><b>Variables</b></p>	<p>Page 24</p> <p>Pages 20-24</p> <p>Pages 21-24</p> <p>Pages 126-141</p> <p>Pages 86-100</p> <p>Pages 6-15</p> <p>Pages 24-28</p>

	Investigation 4 Part 3 <b>Diversity of Life</b> Investigation 6 Part 1 <b>Earth History</b> Investigation 8 Part 2 <b>Electronics</b> Investigation 6 Part 4 <b>Force and Motion</b> Investigation 3 Part 1 <b>Human Brain and Senses</b> Investigation 4 Part 1 <b>Planetary Science</b> Investigation 5 Parts 1-7 <b>Populations and Ecosystems</b> Investigation 6 Parts 1-3 <b>Weather and Water</b> Investigation 7 Part 1 <b>Chemical Interactions</b> Investigation 2 Parts 1-2	Pages 18-23 Pages 186-192 Pages 259-265 Pages 201-208 Pages 111-118 Pages 120-128 Pages 154-182 Pages 179-198 Pages 232-239 Pages 72-81
4. Students will use models that illustrate simple concepts and compare those models to actual phenomena.	<b>Models and Designs</b> throughout, such as Investigation 1 Parts 1-3 <i>Models and Designs FOSS Science Stories</i> <b>Environments</b> Investigation 4 Part 3 <i>Environments FOSS Science Stories</i> <b>Food and Nutrition</b> Investigation 4 Part 1 <i>Food and Nutrition FOSS Science Stories</i> <b>Landforms</b> throughout, such as Investigation 1 Parts 1-3 Investigation 4 Parts 1-3 <i>Landforms FOSS Science Stories</i> <b>Living Systems</b> Investigation 3 Part 1 <b>Water Planet</b> Investigation 1 Part 1 <b>Levers and Pulleys</b> Investigation 2 Parts 1-4 <i>Levers and Pulleys FOSS Science Stories</i> <b>Mixtures and Solutions</b> <i>FOSS Science Stories</i> <b>Solar Energy</b> throughout, such as Investigation 4 Parts 1-3 <b>Variables</b> Investigation 2 Parts 1-3 <b>Diversity of Life</b> Investigation 4 Parts 1-2 <i>Diversity of Life Resources</i> <b>Earth History</b> Investigation 4 Parts 3, 5-6 Investigation 5 Part 3 <i>Earth History Resources</i> <b>Electronics</b> Investigation 1 Part 2 <i>Electronics CD-ROM</i> <i>Electronics Resources</i> <b>Force and Motion</b> Investigation 8 Part 1 <i>Force and Motion CD-ROM</i> <b>Human Brain and Senses</b> Investigation 3 Part 3 <i>Human Brain and Senses CD-ROM</i>	Pages 8-25 Pages 2-3, 5-10 Pages 19-24 Pages 41, 44-45 Page 8-15 Page 4 Pages 8-24 Pages 8-24 Pages 33-34 Pages 118-125 Pages 50-58 Pages 8-25 Pages 5, 17 Pages 32-36 Pages 8-28 Pages 8-23 Pages 133-141 Pages 8, 16 Pgs 138-146, 150-162 Pages 183-187 Pages 88, 89 Pages 61-65 Page 26 Pages 284-293 Pages 106-110 Pages 32-33

	<p><i>Human Brain and Senses Resources</i>  <b>Planetary Science</b> throughout, such as  Investigation 1 Parts 1-2  <i>Planetary Science CD-ROM</i>  <b>Populations and Ecosystems</b>  Investigation 6 Parts 1-3  <i>Populations and Ecosystems CD-ROM</i>  <i>Populations and Ecosystems Resources</i>  <b>Weather and Water</b>  Investigation 7 Part 1  <i>Weather and Water Resources</i>  <b>Chemical Interactions</b>  Investigation 9 Parts 3-4  <i>Chemical Interactions CD-ROM</i></p>	<p>Pages 64-78</p> <p>Pages 179-198</p> <p>Pages 20, 51</p> <p>Pages 232-239  Pages 49, 54, 64</p> <p>Pages 301-312</p>
5. Students will identify a valid test in an investigation.	<p><b>Environments</b>  Investigation 2 Parts 2-3  <b>Food and Nutrition</b>  Investigation 2 Part 1  <b>Mixtures and Solutions</b>  Investigation 2 Part 1  <b>Models and Designs</b>  Investigation 3 Part 3  <b>Solar Energy</b>  Investigation 4 Parts 1-3  <b>Variables</b>  Investigation 3 Parts 1-3  <b>Living Systems</b>  Investigation 3 Part 3  <b>Water Planet</b>  Investigation 3 Part 1  <b>Diversity of Life</b>  Investigation 1 Parts 1-2  <b>Earth History</b>  Investigation 5 Part 2  <b>Electronics</b>  Investigation 1 Part 4  <b>Force and Motion</b>  Investigation 7 Part 1  <b>Planetary Science</b>  Investigation 8 Part 3  <b>Populations and Ecosystems</b>  Investigation 5 Part 1  <b>Weather and Water</b>  Investigation 6 Part 1  <b>Chemical Interactions</b>  Investigation 1 Parts 1-2</p>	<p>Pages 16-25</p> <p>Pages 8-17</p> <p>Pages 8-15</p> <p>Pages 20-23</p> <p>Pages 8-28</p> <p>Pages 8-23</p> <p>Pages 136-141</p> <p>Pages 125-135</p> <p>Pages 43-64</p> <p>Pages 179-182</p> <p>Pages 71-75</p> <p>Pages 210-218</p> <p>Pages 260-264</p> <p>Pages 142-150</p> <p>Pages 190-193</p> <p>Pages 44-58</p>
6. Students will identify how observations of nature form an essential base of knowledge among the Montana American Indians.	<p>Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and natural history.</p> <p><b>Landforms</b> <i>FOSS Science Stories</i>  <b>Solar Energy</b>  Investigation 1 Language Extension 1</p>	<p>Pages 43-44</p> <p>Page 22</p>

## Science Content Standard 2

Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

BENCHMARKS	FOSS INVESTIGATIONS (*available soon)	PAGE NUMBERS
1. Students will classify, describe, and manipulate the physical models of matter in terms of: elements, and compounds, pure substances and mixtures, atoms and molecules.	<b>Mixtures and Solutions</b> Investigation 1 Part 1 <i>Mixtures and Solutions FOSS Science Stories</i> <b>Solar Energy</b> <i>FOSS Science Stories</i> <b>Chemical Interactions</b> throughout, such as Investigation 2 Parts 1-2 Investigation 8 Parts 1-3 <i>Chemical Interactions Resources</i> <i>Chemical Interactions CD-ROM</i> <b>Earth History</b> <i>Resources</i> <b>Electronics</b> <i>Resources</i> <b>Weather and Water</b> Investigation 2 Part 2 <i>Weather and Water Resources</i>	Pages 8-15 Pages 25-28, 32-42 Pages 18-20  Pages 72-81 Pages 251-268 Pages 3-22, 63-68, 90-96 Page 88 Page 26  Pages 76-82 Pages 22-26
2. Students will examine, describe, compare and classify objects and substances based on common physical properties and simple chemical properties.	<b>Environments</b> Investigation 4 Part 2 <b>Food and Nutrition</b> Investigation 1 Part 2 <i>Food and Nutrition FOSS Science Stories</i> <b>Mixtures and Solutions</b> Investigation 1 Parts 1-4 <i>Mixtures and Solutions FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Part 2 <b>Living Systems</b> Investigation 3 Part 3 <b>Water Planet</b> Investigation 3 Part 1 <b>Chemical Interactions</b> ALL, such as Investigation 1 Parts 1-2 <i>Chemical Interactions Resources</i> <i>Chemical Interactions CD-ROM</i> <b>Diversity of Life</b> Investigation 1 Parts 1-2 <b>Earth History</b> Investigation 8 Part 3 <i>Earth History Resources</i> <b>Electronics</b> Investigation 1 Part 4 <i>Electronics Resources</i> <b>Planetary Science</b> Investigation 8 Part 2 <i>Planetary Science Resources</i> <b>Weather and Water</b> Investigation 4 Part 1 <i>Weather and Water Resources</i>	Pages 13-18  Pages 16-20 Pages 1-4, 14  Pages 8-29 Pages 37-42  Pages 16-24  Pages 136-141  Pages 125-135  Pages 44-58 Pages 3-27,90-101  Pages 43-63  Pages 266-269 Pages 68-71, 89-97  Pages 71-75 Page 6  Pages 255-259 Pages 35, 41-42  Pages 121-130 Pages 6-7
3. Students will describe energy and compare and contrast the energy transformations and the characteristics of light, heat, motion, magnetism, electricity, sound and mechanical waves.	<b>Environments</b> <i>FOSS Science Stories</i> <b>Food and Nutrition</b> <i>FOSS Science Stories</i> <b>Models and Designs</b> Investigation 3 Science Extension 3 <i>Models and Designs FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Part 1 <i>Solar Energy FOSS Science Stories</i> <a href="http://www.fossweb.com">www.fossweb.com</a> <i>Solar Energy</i> <b>Living Systems</b>	Page 39 Page 43  Page 26 Pages 4, 40-43  Pages 8-15 Pages 1-3, 16

	<p>Investigation 3 Part 1 <i>Living Systems FOSS Science Resources</i> <b>Chemical Interactions</b> Investigation 4 Parts 1-3 “Kinetic Energy” <i>Chemical Interactions Resources</i> <i>Chemical Interactions CD-ROM</i> <b>Diversity of Life Resources</b> <b>Electronics</b> Investigation 1 Part 1 <i>Electronics Resources</i> <b>Human Brain and Senses</b> Investigation 3 Extending the Experience 1 <b>Populations and Ecosystems</b> Investigation 5 Parts 1-2 <i>Populations and Ecosystems Resources</i> <b>Weather and Water</b> Investigation 4 Part 2 <i>Weather and Water Resources</i> <i>Weather and Water CD-ROM</i></p>	<p>Pages 118-123 Pages 31-34, 47-48</p> <p>Pages 125-142 Pages 23-41</p> <p>Pages 22, 36-37</p> <p>Pages 55-60 Pages 12-14</p> <p>Page 111</p> <p>Pages 142-155 Pages 17-21</p> <p>Pages 131-140 Pages 22-26</p>
<p>4. Students will model and explain the states of matter are dependent upon the quantity of energy present in the system and describe what will change and what will remain unchanged at the particulate level when matter experiences an external force or energy change.</p>	<p><b>Mixtures and Solutions</b> Investigation 4 Part 1 <b>Solar Energy</b> <i>FOSS Science Stories</i> <b>Water Planet</b> Investigation 2 Parts 1, 4 <i>Water Planet FOSS Science Resources</i> <b>Chemical Interactions</b> throughout, such as Investigation 7 Parts 1-5 <i>Chemical Interactions Resources</i> <i>Chemical Interactions CD-ROM</i> <i>Earth History Resources</i> <b>Weather and Water</b> Investigation 5 Part 2 <i>Weather and Water Resources</i></p>	<p>Pages 8-15 Pages 18-20</p> <p>Pages 80-85, 101-110 Pages 28-30, 33-34</p> <p>Pages 206-234 Pages 16-48</p> <p>Pages 89-92</p> <p>Pages 163-168 Pages 22-26</p>
<p>5. Students will describe and explain the motion of an object in terms of its position, direction, &amp; speed as well as the forces acting upon it.</p>	<p><i>Solar Energy FOSS Science Stories</i> <b>Landforms</b> Investigation 3 Parts 1-2 <i>Levers and Pulleys FOSS Science Stories</i> <i>Models and Designs FOSS Science Stories</i> <b>Variables</b> Investigation 3 Parts 1-4 <i>Variables FOSS Science Stories</i> <b>Force and Motion</b> Investigation 4 Parts 1-3 Investigation 6 Parts 1-4 <i>Force and Motion Resources</i> <i>Force and Motion CD-ROM</i> <b>Planetary Science</b> Investigation 3 Parts 1-4 <i>Planetary Science Resources</i></p>	<p>Pages 43-44</p> <p>Pages 8-19 Pages 7-8 Pages 37-43</p> <p>Pages 8-27 Pages 15-17</p> <p>Pages 138-155 Pages 218-245 P 1-6, 17-19, 32-35</p> <p>Pages 89-109 Pages 69-70</p>
<p>6. Students will identify, build, describe, measure, and analyze mechanical systems (e.g., simple and complex machines) and describe the forces acting within those systems.</p>	<p><b>Levers and Pulleys</b> Investigation 3 Parts 1-2 <i>Levers and Pulleys FOSS Science Stories</i> <b>Models and Designs</b> Investigation 3 Parts 1-2 <b>Variables</b> Investigation 3 Parts 1-4 <b>Force and Motion</b> Investigation 6 Part 1 <i>Force and Motion CD-ROM</i> <b>Weather and Water</b> Investigation 8 Part 1</p>	<p>Pages 8-20 <i>Page 18</i></p> <p>Pages 8-19</p> <p>Pages 8-27</p> <p>Pages 218-228</p> <p>Pages 258-264</p>

	<b>Chemical Interactions</b> Investigation 3 Parts 1-3 <i>Chemical Interactions CD-ROM</i>	Pages 95-113
7. Students will give examples and describe how energy is transferred and conserved (e.g. electric to light and heat [light bulb], chemical to mechanical [fuel to propulsion]).	<b>Environments</b> FOSS Science Stories <b>Food and Nutrition</b> Investigation 2 Part 1 <i>Food and Nutrition FOSS Science Stories</i> <b>Living Systems</b> Investigation 3 Parts 1-2 <i>Living Systems FOSS Science Resources</i> <b>Models and Designs</b> Investigation 3 Science Extension 3 <i>Models and Designs FOSS Science Stories</i> <b>Solar Energy</b> Investigation 4 Parts 1-3 <i>Solar Energy FOSS Science Stories</i> <a href="http://www.fossweb.com">www.fossweb.com</a> Solar Energy <b>Chemical Interactions</b> Investigation 4 Parts 1-3 <i>Chemical Interactions Resources</i> <i>Chemical Interactions CD-ROM</i> <b>Diversity of Life Resources</b> <b>Electronics</b> Investigation 8 Part 1 <i>Electronics Resources</i> <b>Human Brain and Senses</b> Investigation 3 Extending the Experience 1 <b>Populations and Ecosystems</b> Investigation 5 Parts 1-4 <i>Populations and Ecosystems Resources</i> <b>Weather and Water</b> Investigation 4 Part 2 <i>Weather and Water Resources</i> <i>Weather and Water CD-ROM</i>	Page 39  Pages 8-17 Page 43  Pages 118-135 Pages 31-36, 47-48  Page 26 Page 25  Pages 8-28 Pages 1-3, 16-17  Pages 125-142 Pages 32-41  Pages 22, 36-37  Pages 250-255 Pages 12-14  Page 111  Pages 142-170 Pages 17-21  Pages 131-139 P 22-26,32-36,53-55

### **Science Content Standard 3**

Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will compare the structure and function of prokaryotic cells (bacteria) and eukaryotic cells (plant, animal, etc.) including the levels of organization of the structure and function, particularly with humans.	<b>Living Systems</b> Investigation 1 Parts 1-3 <i>Living Systems FOSS Science Resources</i> <b>Diversity of Life</b> Investigation 4 Parts 1-2 <i>Diversity of Life CD-ROM</i> The Lab - "Cells and the Ribbon of Life" <i>Diversity of Life Resources</i> <b>Populations and Ecosystems</b> Investigation 5 Part 4 Trophic levels – bacteria; plants/producers; animals/consumers	Pages 51-70 Pages 2-13  Pages 133-141  Pages 27-30  Pages 161-169
2. Students will explain how organisms and systems of organisms obtain and use energy resources to maintain stable conditions (e.g., food webs, photosynthesis, respiration).	<b>Environments</b> <a href="http://www.fossweb.com">www.fossweb.com</a> Activities <i>Environments FOSS Science Stories</i> <b>Food and Nutrition</b> FOSS Science Stories <b>Solar Energy</b> FOSS Science Stories <b>Living Systems</b> Investigation 3 Parts 1-2 <i>Living Systems FOSS Science Resources</i> <b>Diversity of Life</b>	"Virtual Aquarium" Page 39 Pages 6-9, 41-50 Page 1  Pages 118-135 Pages 31-36, 47-48

	CD-ROM Ecoregion - "Example/Food Web" <i>Diversity of Life Resources</i> <b>Populations and Ecosystems</b> Investigation 4 Part 2 Investigation 5 Parts 1-4 <i>Populations and Ecosystems Resources</i> <i>Populations and Ecosystems CD-ROM</i>	Pages 21-39  Pages 122-129 Pages 142-170 Pages 17-21
3. Students will communicate the differences in the reproductive processes of a variety of plants and animals using the principles of genetic modeling (e.g. Punnett squares).	<b>Populations and Ecosystems</b> Investigation 9, Parts 1-4 <i>Populations and Ecosystems Resources</i> <i>Populations and Ecosystems CD-ROM</i>	Pages 262-291 Pages 46-55
4. Students will investigate and explain the interdependent nature of populations and communities in the environment and describe how species in these populations adapt by evolving.	<b>Environments</b> Investigation 4 Part 3 <i>Environments FOSS Science Stories</i> <b>Diversity of Life</b> <i>Diversity of Life CD-ROM</i> Ecoregion - "Example/Food Web" <i>Diversity of Life Resources</i> <b>Populations and Ecosystems</b> ALL such as Investigation 7 Ecoscenarios Investigation 10 Parts 1-3 <i>Populations and Ecosystems Resources</i> <i>Populations and Ecosystems CD-ROM</i>	Pages 19-22 Pg 9-17, 27-45, 49-55  Pages 39, 60-64  Pages 210-218 Pages 302-318 Pages 42-45, 58-61
5. Students will create and use a basic classification scheme to identify plants and animals.	<b>Environments</b> <i>FOSS Science Stories</i> <b>Living Systems</b> Investigation 2 Part 2 <i>Living Systems FOSS Science Resources</i> <b>Diversity of Life</b> throughout, such as Investigation 3 Parts 1-3 Investigation 4 Parts 1-2 <b>Earth History</b> Investigation 7 Part 1 <b>Populations and Ecosystems</b> Investigation 4 Part 2	Pages 18-22  Pages 99-106 Pages 21-22  Pages 102-122 Pages 133-141  Pages 234-239  Pages 122-129

#### **Science Content Standard 4**

Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will model and explain the internal structure of the Earth and describe the formation and composition of Earth's external features in terms of the rock cycle and plate tectonics and constructive and destructive forces.	<b>Landforms</b> Investigation 2 Parts 1-2 <i>Landforms FOSS Science Stories</i> <b>Earth History</b> Investigation 4 Parts 3-4 <i>Earth History CD-ROM</i> Geology Lab <i>Earth History Resources</i> <b>Planetary Science</b> Investigation 5 Parts 6-7 Investigation 8 Part 4 <i>Planetary Science Resources</i>	Pages 8-22 Pages 22-32  Pages 138-149  Pages 93-97,100-105 Pages 176-184 Pages 265-270 Pages 59-62, 67-70
2. Students will differentiate between rock types and mineral types and classify both by how they are formed and the utilization by humans.	<b>Earth History</b> Investigation 4 Parts 5-6 Investigation 5 Parts 1-4 Investigation 8 Parts 1-3 <i>Earth History Resources</i> <i>Earth History CD-ROM</i> Geology Lab <b>Planetary Science</b>	Pages 150-162 Pages 175-194 Pages 254-269 Pages 42-46,68-72,93-97

	Investigation 8 Parts 1-4 <i>Planetary Science Resources</i>	Pages 250-271 Pages 41-42
3. Students will use fossils to describe the geological timeline.	<b>Models and Designs</b> <i>FOSS Science Stories</i> <b>Earth History</b> Investigation 7 Parts 1-2 <i>Earth History Resources</i> <i>Earth History CD-ROM</i>	Pages 11-16  Pages 234-243 Pages 73-80, 83-86
4. Students will describe the water cycle, the composition and structure of the atmosphere and the impact of oceans on large-scale weather patterns.	<b>Solar Energy</b> <i>FOSS Science Stories</i> <b>Water Planet</b> Investigation 4 Parts 1-2 <i>Water Planet FOSS Science Resources</i> <b>Weather and Water</b> Investigation 7 Part 1 <i>Weather and Water Resources</i> <i>Weather and Water CD-ROM</i>	Pages 2, 22-25  Pages 184-203 Pages 67-79  Pages 232-239 Pages 34-47
5. Students will describe and model the motion and tilt of Earth in relation to the Sun, and explain the concepts of day, night, seasons, year, and climatic changes.	<b>Models and Designs</b> Investigation 1 Language Extension <b>Water Planet</b> <i>FOSS Science Resources</i> <b>Solar Energy</b> Investigation 1 Science Extension 1 <i>Solar Energy FOSS Science Stories</i> <b>Planetary Science</b> Investigation 3 Parts 1-4 <i>Planetary Science CD-ROM</i> <b>Weather and Water</b> Investigation 3 Parts 1-3 <i>Weather and Water Resources</i> <i>Weather and Water CD-ROM</i>	Page 26 Page 45  Page 24 Page 2  Pages 89-109  Pages 93-112 Pages 17-19
6. Students will describe the earth, moon, planets and other objects in space in terms of size, force of gravity, structure, and movement in relation to the Sun.	<b>Models and Designs</b> <i>FOSS Science Stories</i> <b>Solar Energy</b> Investigation 2 Math Extension 1 <i>Solar Energy FOSS Science Stories</i> <b>Water Planet</b> Investigation 1 Parts 1-2 <i>Water Planet FOSS Science Resources</i> <b>Planetary Science</b> Investigation 10 Parts 1-3 <i>Planetary Science Resources</i> <i>Planetary Science CD-ROM</i> <b>Weather and Water</b> Investigation 3 Part 2	Pages 5-9  Pages 26-27 Pages 40-43  Pages 50-56 Pages 1-17  Pages 312-325 Pages 35, 84-89  Pages 99-103
7. Students will identify scientific theories about the origin and evolution of the earth and solar system.	<b>Models and Designs</b> <i>FOSS Science Stories</i> <b>Earth History</b> Investigation 7 Part 2 <i>Earth History CD-ROM</i> Time Room – “Time Machine” <i>Earth History Resources</i> <b>Planetary Science</b> Investigation 5 Parts 6-7 Investigation 8 Part 4 <i>Planetary Science Resources</i> <i>Planetary Science CD-ROM</i>	Pages 5-9  Pages 240-243  Pages 100-105  Pages 176-184 Pages 265-270 Pages 69-70

### **Science Content Standard 5**

Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

<b>BENCHMARK</b>	<b>FOSS INVESTIGATIONS</b>	<b>PAGE NUMBERS</b>
1. Students will describe the specific fields of science and technology as they relate to	<b>Environments</b> <i>FOSS Science Stories</i> <b>Food and Nutrition</b> <i>FOSS Science Stories</i> <b>Landforms</b>	Pages 1-8 Pages 5, 9

<p>occupations within those fields.</p>	<p>Investigation 3/ Science Extension 4/1  <i>Landforms FOSS Science Stories</i>  <b>Mixtures and Solutions</b> <i>FOSS Science Stories</i>  <b>Models and Designs</b>  Investigation 3 Language Extension  <i>Models and Designs FOSS Science Stories</i>  <i>Water Planet FOSS Science Resources</i>  <b>Solar Energy</b>  Investigation 2 Language Extension 2  <i>Solar Energy FOSS Science Stories</i>  <b>Variables</b> <i>FOSS Science Stories</i>  <b>Diversity of Life</b> <i>Resources</i>  <b>Earth History</b>  Investigation 8 Extending the Experience 2  <i>Earth History Resources</i>  <b>Electronics</b>  Investigation 5 Part 3  <i>Electronics Resources</i>  <b>Force and Motion</b> <i>Resources</i>  <b>Human Brain and Senses</b>  Investigation 5 Part 2  <i>Human Brain and Senses Resources</i>  <b>Planetary Science</b>  Investigation 7 Parts 1-5  <i>Planetary Science Resources</i>  <b>Populations and Ecosystems</b>  Investigation 6 Part 1  <i>Populations and Ecosystems Resources</i>  <b>Weather and Water</b>  Investigation 1 Parts 1-2  <i>Weather and Water Resources</i>  <b>Chemical Interactions</b> <i>Resources</i>  <i>Chemical Interactions CD-ROM</i></p>	<p>Pages 27/27  Pgs 5-6, 13-14, 19-21  Pages 29-31</p> <p>Page 24  Pages 17-20, 44-55  Pages 15, 18-19</p> <p>Page 25  Pages 4-5, 26-28  Pages 7, 24-28  Pages 65-70</p> <p>Page 275  Pages 98-99</p> <p>Pages 171-174  Pages 18-20, 23-25  Pages 41-45</p> <p>Pages 161-164  Pgs 34-35, 49, 75-82</p> <p>Pages 218-238  P 59-68,74-82,90-100</p> <p>Pages 179-186  Pages 25-31</p> <p>Pages 43-56  Pages 9-11, 63-76  Pages 69-72, <b>78-79</b>,  80-85</p>
<p>2. Students will apply scientific knowledge and process skills to understand issues and everyday events.</p>	<p><b>Environments</b>  Investigation 5 Language Extension  <i>Environments FOSS Science Stories</i>  <b>Food and Nutrition</b>  Investigation 4 Part 1  <i>Food and Nutrition FOSS Science Stories</i>  <b>Landforms</b>  Investigation 2 Social Studies Extension 2  <i>Landforms FOSS Science Stories</i>  <b>Levers and Pulleys</b>  Investigation 3 Science Extension 2  <i>Levers and Pulleys FOSS Science Stories</i>  <i>Water Planet FOSS Science Resources</i>  <i>Living Systems FOSS Science Resources</i>  <b>Mixtures and Solutions</b>  Investigation 3 Science Extension 4  <i>Mixtures and Solutions FOSS Science Stories</i>  <b>Models and Designs</b>  Investigation 4 Science Extension 1  <i>Models and Designs FOSS Science Stories</i>  <b>Solar Energy</b>  Investigation 4 Part 3  <i>Solar Energy FOSS Science Stories</i>  <b>Variables</b>  Investigation 4 Science Extension 4  <i>Variables FOSS Science Stories</i>  <b>Diversity of Life</b>  Investigation 10 Part 3</p>	<p>Page 23  Pages 23-26, 36-37</p> <p>Pages 8-15  Pages 27-29</p> <p>Page 24  Pages 13-21</p> <p>Page 28  Pages 7-9  Page 97  Page 52</p> <p>Page 28  Pages 23-28</p> <p>Page 23  Pages 48-55</p> <p>Pages 24-28  Pages 29-33, 35-37</p> <p>Page 32  Pages 34-37</p> <p>Pages 317-321</p>

	<p><i>Diversity of Life Resources</i>  <b>Earth History</b>  Investigation 4 Extending the Experience 4  <i>Earth History Resources</i>  <b>Electronics</b>  Investigation 8 Extending the Experience 2  <i>Electronics Resources</i>  <b>Force and Motion</b>  Investigation 8 Parts 1-2  <i>Force and Motion Resources</i>  <b>Human Brain and Senses</b>  Investigation 6 Parts 1-3  <i>Human Brain and Senses Resources</i>  <b>Planetary Science</b>  Investigation 3 Parts 1-4  <i>Planetary Science Resources</i>  <i>Planetary Science CD-ROM</i>  <b>Populations and Ecosystems</b>  Investigation 2 Parts 1-2  <i>Populations and Ecosystems Resources</i>  <i>Populations and Ecosystems CD-ROM</i>  <b>Weather and Water</b>  Investigation 9 Parts 1-2  <i>Weather and Water Resources</i>  <i>Weather and Water CD-ROM</i>  <b>Chemical Interactions</b> throughout, such as  Investigation 5 Parts 1-3  <i>Chemical Interactions Resources</i>  <i>Chemical Interactions CD-ROM</i></p>	<p>Pages 65-70  Page 163  Pages 60-67  Page 272  Pages 12-14, 18-25  Pages 284-301  Pages 17-40  Pages 186-204  Pages 34-39, 43-44,  50-51  Pages 89-110  Pages 101-103  Pages 70-79  Pages 25-41  Pages 296-310  Pages 67-76  Pages 155-171  Pages 9-13,16,23,28-  41,73-79</p>
<p>3. Students will simulate collaborative problem solving and give examples of how scientific knowledge and technology are shared with other scientists and the public.</p>	<p><b>Environments</b>  Investigation 6 Parts 1-3  <b>Landforms</b>  Investigation 3 Part 3  <b>Levers and Pulleys</b>  Investigation 3 Science Extension 1  <b>Mixtures and Solutions</b>  Investigation 3 Part 3  <b>Models and Designs</b>  Investigation 3 Part 2  <b>Solar Energy</b>  Investigation 4 Part 3  <b>Water Planet</b>  Investigation 3 Part 1  <b>Living Systems</b>  Investigation 3 Part 3  <b>Variables</b>  Investigation 4 Part 3  <b>Diversity of Life</b>  Investigation 6 Part 1  <b>Earth History</b>  Investigation 7 Part 2  <b>Electronics</b>  Investigation 6 Part 4  <b>Force and Motion</b>  Investigation 3 Part 3  <b>Human Brain and Senses</b>  Investigation 3 Part 2  <b>Planetary Science</b>  Investigation 5 Part 2  <b>Populations and Ecosystems</b>  Investigation 7 Ecoscenarios</p>	<p>Pages 8-22  Pages 20-24  Page 28  Pages 21-24  Pages 13-19  Pages 24-28  Pages 125-135  Pages 136-141  Pages 18-23  Pages 186-192  Pages 240-243  Pages 201-208  Pages 124-127  Pages 101-105  Pages 255-259  Pages 210-218</p>

	<b>Chemical Interactions</b> throughout, such as Investigation 3 Parts 1-3 <b>Weather and Water</b> Investigation 2 Part 1	Pages 95-113  Pages 69-75
4. Students will use scientific knowledge to investigate problems and their proposed solutions and evaluate those solutions while considering environmental impacts.	<b>Environments</b> Investigation 5 Language Extension <i>Environments FOSS Science Stories</i> <b>Landforms</b> <i>FOSS Science Stories</i> <b>Mixtures and Solutions</b> <i>FOSS Science Stories</i> <b>Models and Designs</b> <i>FOSS Science Stories</i> <b>Solar Energy</b> Investigation 4 Part 3 <i>Solar Energy FOSS Science Stories</i> <b>Diversity of Life</b> Investigation 6 Part 3 <b>Earth History</b> Investigation 4 Extending the Experience 4 <i>Earth History Resources</i> <b>Electronics</b> Investigation 4, Parts 1-2 <i>Electronics Resources</i> <b>Force and Motion</b> Investigation 8 Part 1 <b>Planetary Science</b> Investigation 7 Part 5 <b>Populations and Ecosystems</b> Investigation 7 Ecoscenarios <i>Populations and Ecosystems Resources</i> <b>Weather and Water</b> Investigation 9 Parts 3-4 <i>Weather and Water Resources</i> <b>Chemical Interactions</b> Investigation 10 Part 2 <i>Chemical Interactions Resources</i>	Page 23 Pages 35-45, 49-52 Pages 13-14, 37-44 Pages 20-22 Pages 25-28  Pages 24-28 Pages 35-39  Pages 198-202  Page 163 Pages 64-67  Pages 143-151 Pages 18-25  Pages 284-293  Pages 236-237  Pages 210-218 Pages 31-41  Pages 311-320 Pages 63-66  Pages 333-336 Pages 59-62,73-75
5. Students will describe how the knowledge of science and technology influences the development of the Montana American Indian cultures.	Though FOSS is a nation-wide curriculum, this standard is easily addressed through suggested extensions to the FOSS investigations. It can also be addressed in a culturally appropriate way through other connections that Montana teachers will make between science/nature observations in FOSS and local environments and natural history. <b>Landforms</b> <i>FOSS Science Stories</i> <b>Solar Energy</b> Investigation 1 Language Extension 1 <b>Populations and Ecosystems</b> Investigation 2 Part 1 and extensions Investigation 7 and extensions <i>(Students can extend learning basic ecological relationships to local Montana organisms – including humans - and ecosystems.)</i> <b>Chemical Interactions</b> <i>Resources</i>	Pages 43-44  Page 22  Pages 70-75 Pages 210-218  Pages 78-79

### **Science Content Standard 6**

Students understand historical developments in science and technology.

<i>BENCHMARK</i>	<i>FOSS INVESTIGATIONS</i>	<i>PAGE NUMBERS</i>
1. Students will give examples of scientific discoveries and describe the interrelationship between technological	Though FOSS is a nation-wide curriculum, this standard is easily addressed as principles learned FOSS investigations are applied to local examples. Montana teachers will make	

<p>advances and scientific understanding, including Montana American Indian examples.</p>	<p>connections between scientific and technological concepts in FOSS and local environments and natural history.</p> <p><b>Environments</b> Investigation 6 Science Extension 1 <i>Environments FOSS Science Stories</i></p> <p><b>Food and Nutrition</b> Investigation 2 Science Extension 3 <i>Food and Nutrition FOSS Science Stories</i></p> <p><b>Landforms</b> <i>FOSS Science Stories</i></p> <p><b>Levers and Pulleys</b> <i>FOSS Science Stories</i></p> <p><b>Mixtures and Solutions</b> <i>FOSS Science Stories</i></p> <p><b>Water Planet</b> <i>FOSS Science Resources</i></p> <p><b>Models and Designs</b> Investigation 4 Language Extension 1 <i>Models and Designs FOSS Science Stories</i></p> <p><b>Solar Energy</b> Investigation 2 Social Studies Extension 2 <i>Solar Energy FOSS Science Stories</i></p> <p><b>Variables</b> Investigation 1 Language Extension 3 <i>Variables FOSS Science Stories</i> <i>Diversity of Life Resources</i> <i>Earth History Resources</i></p> <p><b>Electronics</b> Investigation 4, Parts 1-2 <i>Electronics Resources</i></p> <p><b>Force and Motion</b> <i>Resources</i></p> <p><b>Human Brain and Senses</b> <i>Resources</i></p> <p><b>Planetary Science</b> Investigation 10 Extending the Experience 1-4 <i>Planetary Science Resources</i></p> <p><b>Populations and Ecosystems</b> Investigation 9 Parts 1-4 <i>Populations and Ecosystems Resources</i></p> <p><b>Chemical Interactions</b> Investigation 4 Parts 1-3 <i>Chemical Interactions Resources</i></p>	<p>Page 24 Pages 43-48</p> <p>Page 28 Pages 26, 34-36 Pages 10-12 Pages 1-4 Pages 5, 8-10 Pages 15, 96</p> <p>Page 21 Pages 5-10</p> <p>Page 25 Pgs 4-5, 12-15, 29-31</p> <p>Page 28 Pages 15-28 Pages 65-70 Pages 60-63</p> <p>Pages 143-151 Pgs 1-2, 23-25, 34-36 Pages 62-66 P 31-3547-49</p> <p>Page 325 P 47-53, 67-68, 78-79</p> <p>Pages 262-291 Pages 8-13, 46-55</p> <p>Pages 125-142 Pages 69-79,80-85</p>
<p>2. Students will identify major milestones in science that have impacted science, technology and society.</p>	<p><b>Environments</b> <i>FOSS Science Stories</i></p> <p><b>Food and Nutrition</b> <i>FOSS Science Stories</i></p> <p><b>Landforms</b> <i>FOSS Science Stories</i></p> <p><b>Levers and Pulleys</b> <i>FOSS Science Stories</i></p> <p><b>Mixtures and Solutions</b> <i>FOSS Science Stories</i></p> <p><b>Water Planet</b> <i>FOSS Science Resources</i></p> <p><b>Models and Designs</b> Investigation 4 Language Extension 1 <i>Models and Designs FOSS Science Stories</i> <i>Solar Energy FOSS Science Stories</i></p> <p><b>Variables</b> Investigation 3 Language Extension 2 <i>Variables FOSS Science Stories</i> <i>Diversity of Life Resources</i> <i>Earth History Resources</i></p> <p><b>Electronics</b> Investigation 4, Parts 1-2 <i>Electronics Resources</i></p> <p><b>Force and Motion</b> Investigation 7 Parts 1-3 <i>Force and Motion Resources</i></p> <p><b>Human Brain and Senses</b> Investigation 5 Parts 1-4</p>	<p>Pages 47-48 Pages 26, 34-36 Pages 11-12, 13-14 Pages 1-4, 7-9 Pages 5, 8-10 Pages 18-19, 96</p> <p>Page 21 Pages 5-10 Page 34</p> <p>Page 29 Pages 15-28 Pages 65-70 Pages 49-54</p> <p>Pages 143-151 Pgs 1-2, 23-25, 34-36</p> <p>Pages 256-272 Pages 62-66</p> <p>Pages 152-176</p>

	<p><i>Human Brain and Senses Resources</i>  <b>Planetary Science</b>  Investigation 2 parts 1-2  <i>Planetary Science Resources</i>  <b>Populations and Ecosystems</b>  Investigation 9 Part 4  <i>Populations and Ecosystems Resources</i>  <b>Weather and Water</b>  Investigation 2 Extending the Experience 3  <b>Chemical Interactions</b>  Investigation 2 Parts 1-2  <i>Chemical Interactions Resources</i>  <i>Chemical Interactions CD-ROM</i></p>	<p>P23-24, 47-49  Pages 64-78  P 47-53, 67-68, 78-79    Pages 287-291  Pages 46-55    Page 82    Pages 72-81  Pages 3-8, 69-85</p>
<p>3. Students will describe and explain science as a human endeavor and an ongoing process.</p>	<p><b>Environments</b>  Investigation 6 Language Extensions 1, 2  <i>Environments FOSS Science Stories</i>  <b>Food and Nutrition</b>  Investigation 4 Part 1  <i>Food and Nutrition FOSS Science Stories</i>  <b>Water Planet FOSS Science Resources</b>  <b>Landforms</b>  Investigation 3 Science Extension 4  <i>Landforms FOSS Science Stories</i>  <i>Levers and Pulleys FOSS Science Stories</i>  <b>Mixtures and Solutions</b>  Investigation 1 Science Extension 3  <i>Mixtures and Solutions FOSS Science Stories</i>  <b>Models and Designs</b>  Investigation 4 Parts 1-2  <i>Models and Designs FOSS Science Stories</i>  <b>Solar Energy</b>  Investigation 3 Social Studies Extension 2  <i>Solar Energy FOSS Science Stories</i>  <b>Variables</b>  Investigation 3 Language Extension 2  <i>Variables FOSS Science Stories</i>  <b>Diversity of Life Resources</b>  <b>Earth History</b>  Investigation 7 Parts 1-2  <i>Earth History Resources</i>  <b>Electronics</b>  Investigation 4, Parts 1-2  <i>Electronics Resources</i>  <b>Force and Motion Resources</b>  <b>Human Brain and Senses</b>  Investigation 1 Parts 1-4  <i>Human Brain and Senses Resources</i>  <b>Planetary Science</b>  Investigation 10 Parts 1-3  <i>Planetary Science Resources</i>  <b>Populations and Ecosystems</b>  Investigation 7 Ecoscenarios  <i>Populations and Ecosystems Resources</i>  <b>Weather and Water</b>  Investigation 9 Part 2  <i>Weather and Water Resources</i>  <b>Chemical Interactions</b>  Investigation 2 Parts 1-2  <i>Chemical Interactions Resources</i>  <i>Chemical Interactions CD-ROM</i></p>	<p>Page 23  Pages 27-37    Pages 8-15  Pages 37-40  Pages 15, 18-19, 96    Page 27  Pages 35-36  Pages 1-4, 7-9    Page 31  Pages 20-22, 43-45    Pages 6-15  Pages 17-20    Page 26  Pages 29-39    Page 29  Pages 18-20  Pages 65-70    Pages 234-243  Pages 60-63    Pages 143-151  Pages 18-21, 23-25  Pages 70-74    Pages 37-60  Pages 80-82    Pages 312-325  Pages 74-82, 90-103    Pages 210-218  Pages 8-13    Pages 315-319  Pages 67-68    Pages 72-81  Pages 3-8, 69-85</p>