



# FOSS Full Option Science System (FOSS™)

## Kindergarten through Grade 8

### Correlation With

# Department of Defense Education Science Content Standards

The following is a correlation of the grades K- 8 portions of the Department of Defense Education Science Content Standards to the Full Option Science System (FOSS). This correlation shows **representative** examples of investigations and activities from the FOSS program that address the Science and Technology Content Standards. A citation does not include all of the investigations or activities from FOSS that might address a particular standard.

To provide maximum flexibility to each school system, the FOSS modules were developed at the Lawrence Hall of Science to be developmentally appropriate for grade level *clusters*. Thus, the some of same modules may be cited as meeting standards in the Grades 1 and 2 sections, the Grades 3 and 4 sections, and the Grades 5 and Integrated Science 1 sections of this correlation.

# DoDEA

## SCIENCE CONTENT STANDARDS

### KINDERGARTEN

*FOSS modules are inquiry-based. The fundamentals of scientific inquiry are embedded in ALL FOSS modules at a developmentally appropriate level. Examples of investigations that address each standard are listed.*

STANDARDS	FOSS Investigations
<p><b>S1. SCIENTIFIC INQUIRY</b></p> <p><b>The student develops abilities necessary to do scientific inquiry and an understanding of scientific inquiry; that is, the student:</b></p> <p><b>S1a:</b> asks questions about objects, organisms, and events in their environment.</p> <p><b>S1b:</b> accesses information from a variety of sources.</p> <p><b>S1c:</b> plans and conducts simple explorations through active play.</p> <p><b>S1d:</b> uses simple equipment and tools to collect and record data, measure data, and make observations</p> <p><b>S1e:</b> uses observations to construct reasonable explanations.</p> <p><b>S1f:</b> communicates scientific explorations and explanations through speaking, drawing, and writing.</p>	<p><b>Animals Two by Two</b> Investigation 2, Part 4; Investigation 4, Part 2</p> <p><b>Trees</b> Investigation 2, Parts 2-3</p> <p><b>Fabric</b> Investigation 2, Parts 1-2</p> <p><b>All Modules:</b> first-hand experiences, “Resources” and “Reading Connections” sections of teacher manual, Big Books for <b>Trees</b> and <b>Animals Two by Two</b>, and <u>FOSS Science Stories</u> for <b>ALL</b> modules</p> <p><b>Wood and Paper</b> Investigation 1, Part 1</p> <p><b>Fabric,</b> Investigation 1, Part 2</p> <p><b>Wood and Paper</b> Investigation 1, Parts 4 and 5 Investigation 3, Part 1</p> <p><b>Fabric,</b> Investigation 2, Parts 1-4</p> <p><b>Animals Two by Two</b> Investigation 4, Parts 1-2</p> <p><b>Fabric</b> Investigation 2, Parts 2 and 3</p> <p><b>Animals Two by Two</b> Investigation 1, Parts 1-4</p> <p><b>Trees</b> Investigation 1, Part 1</p> <p><b>Wood and Paper</b> Investigation 2, Parts 3 and 4</p> <p><b>Fabric</b> Investigation 2, Part 2</p> <p><i>Note: this standard is addressed while students are working at centers or as a class and also during large group discussions, as well as in individual or class books written and illustrated by the students.</i></p>

## **S2: HISTORY AND NATURE OF SCIENCE**

**The student develops awareness of science as a human endeavor; that is, the student:**

**S2a:** demonstrates curiosity and initiative during active play and explorations.

**S2b:** recognizes that in science people work alone or in teams to share ideas and findings.

**S2c:** recognizes the use of science and technology in their everyday lives.

## **S3. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**The student develops an understanding of and types of resources as it relates to their immediate environment; that is, the student:**

**S3a:** demonstrates personal and group safety when engaged in science.

**S3b:** describes the various resources in their environment.

**S3c:** practices conservation of resources.

## **S4. SCIENCE AND TECHNOLOGY**

**The student develops an understanding about science and technology, and the nature of technological design; that is, the student:**

**S4a:** recognizes that tools and technology can be used to observe, measure, and construct things.

**S4b:** explains how tools and technology are

**Animals Two by Two** Investigation 2, Part 2

**Wood and Paper** FOSS Science Stories pp. 9-12

**ALL FOSS Modules** use familiar everyday objects and materials as much as possible and include Home/School Extensions that encourage students to talk about science and technology and continue learning about science and technology with people at home. See for example:

**Trees** Investigation 1, Parts 1-2, 7-8

**Fabric** Investigation 2, Parts 1-4 and

**Fabric** FOSS Science Stories pp. 15, 16-24

**Safety is a top priority** in all FOSS modules. See the "Safety in the Classroom" section in the Overview of each FOSS teacher guide for general guidelines and an explanation of the safety goggle icon. See also:

**Wood and Paper** Investigation 2, Part 1

**Fabric** Investigation 1, Part 6

**Trees ALL**, such as Investigation 1, Parts 1-8

**Trees** FOSS Science Stories pp. 3-24

**Wood and Paper** Investigations 1, 3 **ALL**

**Fabric** FOSS Science Stories pp. 3-24

This standard is addressed in the Materials section of each teacher guide. See also **Wood and Paper** Investigation 3, Part 3 and Investigation 4, Part 1 for specific examples.

**Wood and Paper** Investigation 5, Parts 1-3

**Wood and Paper** FOSS Science Stories **ALL**

**Trees** Investigation 3, Parts 5-7 (loupes)

**Fabric** Investigation 1, Parts 5-6

<p>used at home and school.</p> <p><b>S4c:</b> identifies ways that tools and technology are used to make our lives easier.</p> <p><b>S5. PHYSICAL SCIENCE</b></p> <p><b>The student develops an understanding of matter, motion, and energy; that is, the student:</b></p> <p><b>S5a:</b> sorts, classifies and describes properties of objects and materials, including size, shape, color, texture, weight, and temperature.</p> <p><b>S5b:</b> explores and explains how physical properties may affect the motion of objects.</p> <p><b>S5c:</b> describes observable properties of light, heat and magnets.</p> <p><b>S6: LIFE SCIENCE</b></p> <p><b>The student develops an understanding of organisms and their environments; that is, the student:</b></p> <p><b>S6a:</b> describes, compares and explains the differences between living and non-living things.</p> <p><b>S6b:</b> observes, describes, and compares growth and change in living organisms.</p> <p><b>S6c:</b> identifies, describes, and compares the physical characteristics of plants and animals that live in different environments.</p> <p><b>S6d:</b> develops sensitivity to the needs of living things and the environment.</p> <p><b>S7: EARTH AND SPACE SCIENCES</b></p> <p><b>The student develops an understanding of</b></p>	<p>Investigation 2, Parts 1-4  <b>Fabric</b> FOSS Science Stories pp. 16-24  <b>Trees</b> Investigation 3, Parts 5-7 (loupes)  <b>Wood and Paper</b> Investigation 4, Part 1  <b>Wood and Paper</b> FOSS Science Stories Pp. 3-8,13-23</p> <p><b>Wood and Paper</b> Investigation 1 and 3 ALL  <b>Fabric</b> Investigation 1, Parts 1-2  <b>Animals Two by Two</b> Investigation 2, Part 4</p> <p><b>Wood and Paper</b>  Investigation 1, Parts 4 and 5;  Investigation 3, Part 3</p> <p><b>Animals Two by Two</b> (entire module)  Investigation 1, Parts 1 and 4  Investigation 3, Parts 1-3 and <b>Animals Two by Two</b> FOSS Science Stories</p> <p><b>Trees</b> Investigation 3 and <u>My Very Own Tree</u> big book in module  <b>Trees</b> FOSS Science Stories pp. 3-24  <b>Animals Two by Two</b> (entire module, such as) <b>Investigation 5, Parts 1-4</b></p> <p>This is a focus of the entire <b>Animals Two by Two</b> module. See for example:  <b>Animals Two by Two</b>  Investigation 2, Parts 1-4  <b>Animals Two by Two</b> FOSS Science Stories pp. 3-24</p> <p><b>Trees</b> ALL, such as Investigation 3, Parts 1-9  <b>Trees</b> FOSS Science Stories pp. 3-24 and <u>My Very Own Tree</u> (big book in kit)  <b>Animals Two by Two</b> ALL, including Investigation 1, Parts 1-4</p>
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**Earth materials, objects in the sky, and changes in Earth and sky; that is, the student:**

**S7a:** identifies and describes simple properties of rock, soil, water and air.

**S7b:** identifies and describes features of objects in the sky such as sun, moon and stars.

**S7c:** describes, compares and explains differences between day and night.

**S7d:** describes, compares and explains seasonal and weather changes and how they affect personal needs.

**Fabric** Investigation 2, Parts 1-2

**Wood and Paper** Investigation 1, Parts 3-5; Investigation 4, Part 1

*This standard is also addressed in FOSS Pebbles, Sand and Silt, designed for Grades 1-2.*

*This standard is addressed in FOSS Air and Weather, designed for Grades 1-2.*

*This standard is addressed in FOSS Air and Weather, designed for Grades 1-2.*

**Trees** Investigation 3 and **Trees** FOSS Science Stories pp. 14-24

**Fabric** Investigation 2, Part 4

*This standard is also addressed in FOSS Air and Weather, designed for Grades 1-2.*

# DoDEA

## SCIENCE CONTENT STANDARDS

### GRADE ONE

*FOSS modules are inquiry-based. The fundamentals of scientific inquiry are embedded in ALL FOSS modules at a developmentally appropriate level. Examples of investigations that address each standard are listed.*

STANDARDS	FOSS Investigations
<p><b>S1. SCIENTIFIC INQUIRY</b></p> <p><b>The student demonstrates abilities necessary to do scientific inquiry and an understanding of scientific inquiry; that is, the student:</b></p> <p><b>S1a:</b> asks questions about objects, organisms, and events in their environment.</p> <p><b>S1b:</b> accesses information from a variety of sources.</p> <p><b>S1c:</b> plans and conducts explorations and investigations.</p> <p><b>S1d:</b> uses simple equipment and tools to observe, gather and record data.</p> <p><b>S1e:</b> uses observations and recorded data to construct reasonable explanations.</p> <p><b>S1f:</b> communicates scientific explorations, investigations and explanations through speaking, drawing, and writing.</p>	<p>Students ask questions, conduct investigations using simple equipment, construct explanations and communicate results and conclusions throughout <u>ALL</u> FOSS modules. The examples listed below are representative, not an exhaustive listing.</p> <p><b>Air and Weather</b> Investigation 2, Parts 1- 4</p> <p><b>New Plants</b> Investigation 4, Parts 1 and 2 <b>New Plants FOSS Science Stories</b> pp. 18-23 <a href="http://www.fossweb.com">www.fossweb.com</a></p> <p><b>Solids and Liquids</b> Investigation 4, Parts 2-3</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 2, Parts 1-3</p> <p><b>Air and Weather</b> Investigation 4, Parts 1-2 <b>Insects</b> Investigation 1, Parts 2 and 3</p> <p><b>Air and Weather</b> Investigation 1, Parts 1-6 <b>New Plants</b> Investigation 1, Parts 2-3</p>
<p><b>S2: HISTORY AND NATURE OF SCIENCE</b></p> <p><b>The student demonstrates an understanding of science as a human endeavor; that is, the student:</b></p> <p><b>S2a:</b> demonstrates curiosity and initiative in thinking and doing science.</p> <p><b>S2b:</b> works alone or as a team member when</p>	<p><b>ALL FOSS Modules</b> encourage curiosity and teamwork as students explore the natural world. See for example: <b>Balance and Motion</b> Investigation 1, Parts 1-4</p> <p><b>Pebbles, Sand, and Silt</b></p>

engaged in science and shares ideas and explains scientific findings.

**S2c:** recognizes that people of all ages, backgrounds and groups have made contributions to science and technology.

### **S3. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**The student demonstrates an understanding of safety and types of resources and changes in the environment; that is, the student:**

**S3a:** demonstrates personal and group safety when engaged in science at school.

**S3b:** identifies and compares sources and quantities of resources.

**S3c:** practices conservation of resources.

### **S4. SCIENCE AND TECHNOLOGY**

**The student develops an understanding about science and technology, and the nature of technological design; that is, the student:**

**S4a:** explains how tools are designed to help people to extend their senses and solve problems.

**S4b:** uses tools to measure, construct, and test their own product/design.

**S4c:** explains how tools and technology are used to make our lives easier.

### **S5. PHYSICAL SCIENCE**

**The student develops an understanding of**

Investigation 1, Parts 1-4

**Solids and Liquids**

Investigation 4, Part 3

**Air and Weather**

Investigation 2, Parts 1-4

**Air and Weather FOSS Science Stories**

Pp. 14-16 (meteorologists)

**Pebbles, Sand, and Silt**

Investigation 1, Part 1 (geologists)

**Pebbles, Sand and Silt FOSS Science**

**Stories** pp. 14-18

**Safety is a top priority** in all FOSS modules. See the “Safety in the Classroom” section in the Overview of each FOSS teacher guide for general guidelines and an explanation of the safety goggle icon found at each place in the lesson where potential safety issues arise.

See for example:

**Air and Weather**

Investigation 1, Parts 4-6

**Pebbles, Sand, and Silt**

Investigation 3, Parts 1-5

**Pebbles, Sand and Silt FOSS Science**

**Stories** pp. 14-24

Conservation and re-use of resources is stressed in EVERY teacher guide. See for example:

**Pebbles, Sand, and Silt**

Investigation 2, Parts 1-2

**Insects** ALL investigations, such as Investigation 1, Parts 1-3 (hand lenses)

**Air and Weather**

Investigation 2, Parts 1-4 (weather tools)

Meteorologist Tool Kit

**Air and Weather FOSS Science Stories**

Pp. 14-16

**Solids and Liquids**

Investigation 3, Parts 1-4 (screens, bottles)

**matter, motion, and energy; that is, the student:**

**S5a:** recognizes that materials exist in different states such as solids, liquids, and gases.

**S5b:** describes how the properties of objects can be changed such as by heating, cutting, and freezing.

**S5c:** demonstrates how pushing and pulling will change the movement of an object such as speed, position and direction.

**S5d:** investigates sources of light and heat as forms of energy.

**S6: LIFE SCIENCE**

**The student develops an understanding of organisms and their environments; that is, the student:**

**S6a:** describes and compares the physical characteristics and basic needs of plants and animals that live in different environments.

**S6b:** describes and compares how living organisms adapt to daily, seasonal, and yearly environmental changes.

**S6c:** explore the stages of the life cycle in plants and animals.

**S6d:** develops sensitivity to the needs of living things and the environment.

**S7: EARTH AND SPACE SCIENCES**

**The student demonstrates an understanding of Earth materials, objects in the sky, and changes in Earth and sky;**

**Solids and Liquids** ALL, including Investigation 1, Parts 1-3 (solids)  
Investigation 2, Parts 1-3 (liquids)  
**Solids and Liquids** FOSS Science Stories  
Pp. 3-13

**Air and Weather**  
Investigation 1, Parts 1-6 (gases)

**Solids and Liquids** FOSS Science Stories  
Pp. 14-23

**Balance and Motion**  
Investigation 2, Parts 1-2 (spinners)  
Investigation 3, Parts 1-3 (rollers)  
**Balance and Motion** FOSS Science Stories  
pp. 10-23

**Air and Weather**  
Investigation 2, Part 2  
Investigation 4, Part 2

**New Plants**  
Investigation 1, Parts 1-3  
**New Plants** FOSS Science Stories pp. 3-7  
**Insects** ALL, including  
Investigation 3, Parts 1-3

**Insects** Investigation 5, Part 3  
Investigation 6, Parts 1 and 2  
**New Plants** FOSS Science Stories pp. 18-23

**New Plants** Investigation 1, Parts 1-3  
(Wisconsin fast plants)  
**Insects** Investigations 1-5 ALL  
**Insects** FOSS Science Stories pp.

**Insects** Investigations 1-6 ALL  
**Insects** FOSS Science Stories pp. 3-23  
**New Plants** Investigations 1-4 ALL  
**New Plants** FOSS Science Stories pp. 3-23

<p><b>that is, the student:</b></p> <p><b>S7a:</b> describes, classifies and compares the properties of rock, soil, water and air.</p> <p>.</p> <p><b>S7b:</b> describes location, movement and features of the sun, moon and stars.</p> <p><b>S7c:</b> describes, compares and explains changes and patterns in weather and seasons.</p>	<p><b>Pebbles, Sand and Silt</b>  Investigation 1, Parts 1-5 (rocks)  <u>Peter and the Rocks</u> (book in kit)  Investigation 4, Parts 1-3 (soil)  <b><u>Pebbles, Sand and Silt</u></b> FOSS Science  <u>Stories</u> pp. 3-11, 18-23</p> <p><b>Air and Weather</b>  Investigation 1, Parts 1-6 (air)</p> <p><b>Solids and Liquids</b>  Investigation 2, Parts 1-2 (water)  Investigation 4, Parts 1-2 (water interactions)</p> <p><b>Air and Weather</b>  Investigation 4, Part 3</p> <p><b>Air and Weather</b>  Investigation 4, Parts 1-2</p>
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# DoDEA

## SCIENCE CONTENT STANDARDS

### GRADE TWO

*FOSS modules are inquiry-based. The fundamentals of scientific inquiry are embedded in ALL FOSS modules at a developmentally appropriate level. Examples of investigations that address each standard are listed.*

STANDARDS	FOSS Investigations
<p><b>S1. SCIENTIFIC INQUIRY</b></p> <p><b>The student demonstrates abilities necessary to do scientific inquiry and an understanding about scientific inquiry; that is, the student:</b></p> <p><b>S1a:</b> asks questions about objects, organisms, events, and relationships in the environment.</p> <p><b>S1b:</b> accesses and uses information from a variety of sources.</p> <p><b>S1c:</b> plans and conducts explorations and investigations.</p> <p><b>S1d:</b> employs equipment and tools to systematically gather and record data.</p> <p><b>S1e:</b> uses recorded data to construct reasonable explanations and make predictions.</p> <p><b>S1f:</b> communicates scientific explorations, investigations and explanations through speaking, drawing, and writing.</p> <p><b>S2: HISTORY AND NATURE OF SCIENCE</b></p> <p><b>The student demonstrates an</b></p>	<p>Students ask questions, conduct investigations using simple equipment, construct explanations and communicate results and conclusions throughout <u>ALL</u> FOSS modules. The examples listed below are representative, not an exhaustive listing.</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 1, Part 1 <b><u>Pebbles, Sand and Silt</u></b> FOSS Science Stories pp. 18-23 <b>Insects</b> Investigation 3, Parts 1-3</p> <p><b>New Plants</b> Investigation 4, Parts 1 and 2 <b><u>New Plants</u></b> FOSS Science Stories pp. 18-23 <a href="http://www.fossweb.com">www.fossweb.com</a></p> <p><b>Solids and Liquids</b> Investigation 4, Parts 1-3</p> <p><b>Air and Weather</b> Investigation 2, Parts 1-4 weather tools “Meteorologist Tool Kit” extension <b>Insects</b> ALL, such as Investigation 2, Parts 1-3 (hand lenses)</p> <p><b>Balance and Motion</b> Investigation 1, Part 2 <b>New Plants</b> Investigation 2, Part 2 <b><u>New Plants</u></b> FOSS Science Stories pp. 8-11</p> <p><b>Pebbles, Sand, and Silt</b> Investigation 2, Part 3 <b>Insects</b> ALL, such as Investigation 1, Parts 1-3 <b>Air and Weather</b> journal</p>

**understanding of science as a human endeavor; that is, the student:**

**S2a:** demonstrates curiosity, initiative and persistence in thinking about and doing science.

**S2b:** works alone and together as a team member when engaged in science and communicates findings to others.

**S2c:** recognizes that people of all ages, backgrounds and groups make contributions to science and technology.

### **S3. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**The student demonstrates an understanding of safety and types of resources and changes in the environment; that is, the student:**

**S3a:** practices personal and group safety when engaged in science at school.

**S3b:** compares the needs of a population with the sources and quantities of resources.

**S3c:** practices conservation of resources.

### **S4. SCIENCE AND TECHNOLOGY**

**The student demonstrates an understanding of science and technology, and the nature of technological design; that is, the student:**

**S4a:** knows that people use science and technology to answer questions and solve problems.

**S4b:** explains areas in which technology has impacted human lives.

**ALL FOSS Modules** encourage curiosity and teamwork as students explore the natural world. See for example:

#### **Balance and Motion**

Investigation 1, Part 4 (especially persistence)

#### **Pebbles, Sand, and Silt**

Investigation 3, Parts 1-4

#### **Solids and Liquids**

Investigation 3, Parts 1-4

#### **Air and Weather**

Investigation 2, Parts 1-4

#### **Air and Weather FOSS Science Stories**

Pp. 14-16 (meteorologists)

#### **Pebbles, Sand, and Silt**

Investigation 1, Part 1 (geologists)

#### **Pebbles, Sand and Silt FOSS Science**

Stories pp. 14-18

**Safety is a top priority in all FOSS modules.**

See the safety poster and “Safety in the Classroom” section in the Overview of each FOSS teacher guide for general guidelines and an explanation of the safety goggle icon. See for example the icons in **Air and Weather** Investigation 1 for air piston safety tips.

Teacher directed objective/Investigation.

Conservation is stressed in the Teacher Guide for **each** FOSS Module.

See for example:

**Insects** Investigation 6 insect habitat construction from conserved materials and **Air and Weather** Home/School extensions (ex. Rain gauge from 2 liter pop bottle)

FOSS Science Stories and the “Careers” section of fossweb.com feature scientists using science and technology to answer questions and solve problems. See for example:

#### **Air and Weather FOSS Science Stories**

Pp. 14-15

#### **Solids and Liquids**

Investigation 4, Part 3 (toothpaste)

**S4c:** explains that people are always inventing new tools and ways of doing things.

## **S5. PHYSICAL SCIENCE**

**The student demonstrates a conceptual understanding of matter, motion, and energy; that is, the student:**

**S5a:** compares and contrasts properties of objects, such as size, weight, and color of objects and the ability of materials to react with other substances.

**S5b:** describes different states of matter.

**S5c:** describes positions and motion of objects and explains relationships between motion and applied forces.

**S5d:** investigates light, heat, and magnetism as sources of energy.

## **S6: LIFE SCIENCE**

**The student demonstrates a conceptual understanding of organisms and their environments; that is, the student:**

**S6a:** classifies living things according to physical characteristics.

**S6b:** explains how the uniqueness of an organism's physical characteristics help it survive in the environment.

**S6c:** explores the environmental factors that

### **Pebbles, Sand, and Silt**

Investigation 2, Parts 3 and 4

**Pebbles, Sand and Silt FOSS Science Stories** pp. 8-11

### **Air and Weather**

Investigation 2, Parts 1-4

**Air and Weather FOSS Science Stories**  
Pp. 14-16 (meteorologists)

### **Pebbles, Sand, and Silt**

Investigation 1, Parts 1-5

Peter and the Rocks (book in kit)

Investigation 2, Parts 1-4

### **Solids and Liquids**

Investigation 4, Part 3

### **Solids and Liquids**

Investigations 1, 2, 4

**Solids and Liquids FOSS Science Stories**  
Pp. 3-7, 8-13, 18-23

### **Balance and Motion**

Investigation 2, Part 3

**Balance and Motion FOSS Science Stories**  
pp. 14-17

*These standards are addressed in the FOSS Module Magnetism and Electricity, designed for grades 3-4.*

**Insects** Investigation 5, Parts 1-3

Insects FOSS Science Stories pp. 16-21

**New Plants** Investigation 2, Parts 1-3

**New Plants FOSS Science Stories** pp. 3-11

**Insects** ALL, including

Investigation 3, Parts 1-3

Investigation 6, Parts 1-3

**Insects FOSS Science Stories** pp. 3-11

**New Plants** Investigation 1, Parts 1-3

Brassica rapa

**New Plants FOSS Science Stories** pp. 3-11

**New Plants** Investigation 1, Parts 1-3

impact the life spans and cycles of organisms.

**S6d:** demonstrates respect, care and sensitivity to the needs of living things in the environment.

## **S7: EARTH AND SPACE SCIENCES**

**The student demonstrates a conceptual understanding of Earth materials, objects in the sky, and changes in Earth and sky; that is, the student:**

**S7a:** identifies and classifies the materials that Earth is made of (rocks, minerals, soils, water and gases of the atmosphere).

**S7b:** explains how changes in the Earth and sky cause seasonal changes.

**S7c:** explains how weather conditions (such as temperature and precipitation) can change daily, and how weather patterns change over seasons

**S7d.** identifies patterns and changes in the Earth and sky (such as the amount of daylight and shadows) and their impact on living organisms.

**New Plants** FOSS Science Stories pp. 8-15

**Insects** Investigations 1-5

**Insects** FOSS Science Stories pp.16-21

**Insects** Investigations 1-5

**Insects** FOSS Science Stories pp.16-21, 24

**New Plants** ALL, such as

Investigation 1, Parts 1-3

Investigation 4, Parts 1 and 2

**New Plants** FOSS Science Stories pp.3-11, 18-23

**Pebbles, Sand, and Silt**

Investigation 1, Parts 1, 3, 4

Investigation 2, Parts 1-3

**Pebbles, Sand and Silt** FOSS Science Stories pp. 8-11

**Solids and Liquids**

Investigation 1, Part 1

**Air and Weather**

Investigation 1, Parts 1-6

**Air and Weather** FOSS Science Stories

Pp. 3-6

*Note: this standard is addressed in **Weather and Water**, a FOSS module designed for Middle School.*

**Air and Weather**

Investigation 2, Parts 1-4 collecting data

Investigation 4, Parts 1-2 graphing and noting

changes and patterns in weather data

**Air and Weather** FOSS Science Stories

Pp. 7-14,18-23

**Air and Weather**

Investigation 4, Part 3

*Note: this standard is addressed in much*

*greater detail in **Solar Energy**, a FOSS*

*module designed for Grades 5-6, and in*

***Planetary Science and Weather and Water**,*

*designed for Middle School.*

# DoDEA

## SCIENCE CONTENT STANDARDS

### GRADE THREE

*FOSS modules are inquiry-based. The fundamentals of scientific inquiry are embedded in ALL FOSS modules at a developmentally appropriate level. Examples of investigations that address each standard are listed.*

STANDARDS	FOSS Investigations
<p><b>S1. SCIENTIFIC INQUIRY</b></p> <p><b>The student demonstrates abilities necessary to do scientific inquiry and an understanding about scientific inquiry; that is, the student:</b></p> <p><b>S1a:</b> asks questions about objects, organisms, events, and relationships in the environment.</p> <p><b>S1b:</b> accesses and uses information from a variety of sources.</p> <p><b>S1c:</b> plans and conducts explorations and investigations based on the nature of the question.</p> <p><b>S1d:</b> employs appropriate equipment and tools to systematically gather, record, and analyze data.</p> <p><b>S1e:</b> uses revised data to construct reasonable explanations and make predictions.</p> <p><b>S1f:</b> communicates investigations and explanations using scientific language and</p>	<p>Students ask questions, conduct investigations using simple equipment, construct explanations and communicate results and conclusions throughout <u>ALL</u> FOSS modules. The examples listed below are representative, not an exhaustive listing.</p> <p><b>Structures of Life</b> ALL, including Investigation 3, Parts 1-3  <b>Water</b> Investigation 2, Parts 1-3</p> <p>This standard is met in each module through hands-on investigations, readings (including FOSS Science Stories), and accessing information on the Internet via FOSS Web. See for example:  <b>Earth Materials</b>            Investigation 2, Part 1  <b>Earth Materials</b> FOSS Science Stories            Pp. 8-15, 24-29  <a href="http://www.fossweb.com">www.fossweb.com</a></p> <p>This standard is met through the hands-on investigations and especially in the end-of-module projects in ALL FOSS modules. See for example:  <b>Structures of Life</b>            Investigation 1, Part 3 and            Investigation 4, Part 4 “Choosing Your Own Investigation”</p> <p><b>Measurement</b> ALL, such as Investigation 3, Parts 1-3 (volume tools)  <b>Earth Materials</b>            Investigation 1, Parts 1-2</p> <p><b>Magnetism and Electricity</b>            Investigation 1, Part 3</p> <p><b>Magnetism and Electricity</b>            Investigation 1, Part 3</p>

mathematics.

## **S2: HISTORY AND NATURE OF SCIENCE**

**The student demonstrates an understanding of science as a human endeavor; and the history and nature of science, that is, the student:**

**S2a:** demonstrates curiosity, persistence and begins to use reasoning in thinking about and doing science.

**S2b:** knows that in science people work alone or as a team member and share and critique new information with others.

**S2c:** describes how careers in science have changed throughout history.

**S2d:** describes the variety of contributions made by men and women scientists of different cultures throughout history.

## **S3. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**The student demonstrates an understanding of safety and types of resources and changes in the environment; that is, the student:**

**S3a:** practices personal and group safety when engaged in science.

**S3b:** compares the needs of a population with sources and changes in environmental resources.

**S3c:** practices conservation of resources.

## **S4. SCIENCE AND TECHNOLOGY**

**The student demonstrates an understanding about science and technology, and the nature of technological design; that is, the student:**

**S4a:** understands how tools, technology and inventions are designed to answer questions

## **Structures of Life**

Investigation 1, Parts 1 and 3

**ALL FOSS Modules** encourage curiosity and expect reasoning at a developmentally appropriate level as students explore the natural world. See for example

### **Ideas and Inventions**

Investigation 3, Parts 1-3

Students work in collaborative groups of 4 in ALL FOSS Grades 3-6 modules. See for example:

**Water** Investigation 4, Parts 1-3

FOSS Web site: Careers section (for each module)

**Water** FOSS Science Stories pp. 24-26

**Structures of Life** FOSS Science Stories

Pp. 6-9

**Ideas and Inventions** FOSS Science Stories

pp. 1-29

**Safety is a top priority in all FOSS modules.** See the safety poster and “Safety in the Classroom” section in the Overview of each FOSS teacher guide for general guidelines and an explanation of the safety goggle icon. See for example the icons in **Earth Materials** Investigation 1, Part 2 p. 19

**Water** FOSS Science Stories pp. 1-2,10-11,17-29

Conservation is stressed in the Teacher Guide for **each** FOSS Module.

See for example:

**Water**, Investigation 1, Part 1 “Getting Ready” p. 9 and Clean-up p. 12

**Water** FOSS Science Stories pp. 17-21

FOSS Science Stories and the “Careers” section of [fossweb.com](http://fossweb.com) feature scientists using science and technology to answer questions and solve problems. See for

and help solve problems.

**S4b:** understands how tools, technology and inventions impact people and other living organisms.

**S4c:** recognizes that people are always inventing new tools, technology and inventions.

## **S5. PHYSICAL SCIENCE**

**The student demonstrates a conceptual understanding of matter, motion, and energy; that is, the student:**

**S5a:** classifies objects according to their chemical and physical properties.

**S5b:** investigates, compares and records changes in the states of matter caused by heating or cooling.

**S5c:** designs an investigation to measure and explain relationships between motion and applied forces.

**S5d:** explores and compares light, heat and magnetism as forms of energy and records findings.

**S5e:** explores how heat is conducted through various materials and that some materials conduct heat better than others.

**S5f:** investigates how sound is produced by vibrating objects and understands that pitch is dependent upon the frequency of the vibration.

## **S6: LIFE SCIENCE**

**The student develops a conceptual understanding of organisms and their environments; that is, the student:**

**S6a:** classifies living organisms in multiple ways according to their characteristics.

example:

**Ideas and Inventions** FOSS Science Stories pp. 1-3,10,17-18,21-22,28-29

**Water** FOSS Science Stories pp. 10-11,17-23, 24-26, 27-29

**Earth Materials** FOSS Science Stories Pp. 3,8-9,12-13,24-29

**Measurement** FOSS Science Stories pp. 1-6,8-9,14-15,21-23

### **Earth Materials**

Investigation 4, Part 1

**Water** Investigation 1, Parts 1-2

**Ideas and Inventions** Investigation 1, Part 2

**Water** Investigation 2, Parts 1-3

*This standard is addressed in **Variables, Levers and Pulleys, and Models and Designs**, designed for Grades 5-6.*

### **Ideas and Inventions**

Investigation 4, Parts 1-2 (light)

#### **Magnetism and Electricity**

Investigation 1, Parts 1-4 (magnetism)

Investigation 2, Parts 1-4 (light/heat)

*Heat conduction is addressed in **Solar Energy**, a FOSS module designed for Grades 5-6.*

**Physics of Sound** ALL, including Investigation 2, Parts 1-2 and Home/School Extensions

### **Structures of Life**

Investigations 1-4 all

**Structures of Life** FOSS Science Stories

Pp. 1-3, 17-27

<p><b>S6b:</b> explains how an organism’s behavior is influenced by its environment.</p> <p><b>S6c:</b> compares the factors that impact the life spans and cycles of organisms.</p> <p><b>S6d:</b> develops examples of simple food chains and webs and the interdependence of animals on plants.</p> <p><b>S6e:</b> explores the characteristics of populations.</p> <p><b>S7: EARTH AND SPACE SCIENCES</b></p> <p><b>The student demonstrates a conceptual understanding of Earth materials, objects in the sky, and changes in Earth and sky; that is, the student:</b></p> <p><b>S7a:</b> understands that Earth’s materials (rocks, minerals, soil, water and gases of the atmosphere) have different properties that affect their use as a natural resource.</p> <p><b>S7b:</b> understands that objects in the sky have properties, location and movement that can be observed, described and recorded.</p> <p><b>S7c:</b> explains how clouds are formed and move and their role in weather.</p> <p><b>S7d: describes changes in Earth caused by weathering and the patterns of movement of objects in the sky.</b></p>	<p>FOSS Web: Pictures <b>Ideas and Inventions</b> Investigation 1, Part 2 (leaves)</p> <p><b>Structures of Life</b> Investigation 2, Parts 1-3 Investigation 3, Parts 1-4 Investigation 4, Parts 1-3 <b>Structures of Life FOSS Science Stories</b> Pp. 12-16, 17-25, 26-27</p> <p><b>Structures of Life</b> Investigation 2, Parts 1-3 bean life cycle <b>Water FOSS Science Stories</b> pp. 5-7 <i>Note: life cycles are more a focus of the Grades 1-2 life science modules <b>Insects</b> and <b>New Plants</b>.</i></p> <p><b>Structures of Life FOSS Science Stories</b> Pp. 4-5, 12-16, 28 <b>Water FOSS Science Stories</b> pp. 5-7</p> <p><b>Ideas and Inventions</b> Investigation 2, Parts 1-3 (fingerprints) <b>Ideas and Inventions FOSS Science Stories</b> pp. 11-14 <i>Note: this standard is addressed in greater depth in <b>Environments</b>, designed for Grades 5-6.</i></p> <p><b>Earth Materials</b> ALL, such as Investigation 1, Parts 1-3 Investigation 2, Parts 1-2 <b>Earth Materials FOSS Science Stories</b> Pp. 8-9,10-11,12-13,14-15,24-29 <b>Water</b> Investigation 3, Parts 1-4 <b>Water FOSS Science Stories</b> pp. 1-4, 8-26</p> <p><i>Objects in the sky are observed and investigated in <b>Air and Weather</b>, designed for Grades 1-2 and <b>Solar Energy</b> for Grades 5-6.</i></p> <p><b>Water</b> Investigation 3, Parts 1-4 <b>Water FOSS Science Stories</b> pp.13-16</p> <p><b>Earth Materials FOSS Science Stories</b> pp. 5-7, 25-26 (weathering) <b>Water FOSS Science Stories</b> pp.13-16 (water cycle/cloud movement) <i>Objects in the sky are observed and investigated in <b>Air and Weather</b>, designed for Grades 1-2 and <b>Solar Energy</b> for Grades 5-6.</i></p>
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# DoDEA

## SCIENCE CONTENT STANDARDS

### GRADE FOUR

*FOSS modules are inquiry-based. The fundamentals of scientific inquiry are embedded in ALL FOSS modules at a developmentally appropriate level.*

*Examples of investigations that address each standard are listed.*

<b>STANDARDS</b>	<b>FOSS Investigations</b>
<p><b>S1. SCIENTIFIC INQUIRY</b></p> <p><b>The student demonstrates abilities necessary to do scientific inquiry and an understanding about scientific inquiry; that is, the student:</b></p> <p><b>S1a:</b> asks questions about objects, organisms, events, and relationships in the environment.</p> <p><b>S1b:</b> accesses, evaluates and uses information from a variety of sources.</p> <p><b>S1c:</b> plans, conducts, and records simple investigations based upon the nature of the questions to be answered.</p> <p><b>S1d:</b> employs simple instruments such as rulers, magnifiers, and thermometers to systematically gather, record, analyze and interpret data.</p> <p><b>S1e:</b> uses data to construct reasonable explanations and to make predictions.</p>	<p>Students ask questions, conduct investigations using simple equipment, use information from multiple sources, construct explanations and communicate results and conclusions throughout <u>ALL</u> FOSS modules. The examples listed below are representative, not an exhaustive listing.</p> <p><b>Human Body</b> ALL, including Investigation 1, Parts 1-3 <b>Ideas and Inventions</b> Investigation 1, Part 2</p> <p>This standard is met in each module through hands-on investigations, readings (including FOSS Science Stories), Home/School connections and accessing information on the Internet via FOSS Web. See for example: <b>Physics of Sound</b> Investigation 2, Parts 1-3 <b>Physics of Sound</b> FOSS Science Stories Pp. 1-29 <a href="http://www.fossweb.com">www.fossweb.com</a></p> <p>This standard is met through the hands-on investigations and especially in the end-of-module projects in ALL FOSS modules. See for example: <b>Human Body</b> Investigation 1, Part 3 and Investigation 4, Part 4 "Choosing Your Own Investigation"</p> <p><b>Measurement</b> ALL, such as Investigation 3, Parts 1-3 (volume tools) <b>Earth Materials</b> Investigation 1, Parts 1-2</p> <p><b>Magnetism and Electricity</b> Investigation 1, Part 3 <b>Human Body</b> Investigation 4, Parts 1-3</p>

**S1f:** reviews and asks questions about the reports and results of other scientists' work.

**S1g:** communicates findings and conclusions of investigations using scientific language and mathematics.

## **S2: HISTORY AND NATURE OF SCIENCE**

**The student demonstrates an understanding of science as a human endeavor; and the history and nature of science, that is, the student:**

**S2a:** recognizes that doing science requires varying human abilities, interest and habits of mind (such as: reasoning, insight, skill, creativity, flexibility, and skepticism).

**S2b:** demonstrates and models working alone or as a team member and share and critique new information.

**S2c:** explains how developments throughout history have impacted upon science as a career.

**S2d:** explains how men and women in science have made contributions that impact the quality of life.

## **S3. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**The student demonstrates an understanding of safety and types of resources, changes in environments, and science and technology in local challenges; that is, the student:**

**S3a:** identifies the benefits and practices of appropriate personal safety, health, and nutrition and resource conservation.

### **Magnetism and Electricity**

Investigation 1, Part 3

### **Physics of Sound**

Investigation 4, Part 1

### **Structures of Life**

Investigation 1, Parts 1 and 3

### **Magnetism and Electricity**

Investigation 1, Part 3

### **Ideas and Inventions**

Investigation 2, Parts 1-3

**ALL FOSS Science Stories** provide numerous examples of scientists displaying scientific habits of mind such as those listed in S2a, and students are encouraged to practice the same ones as they go through the investigations. See for example:

**Magnetism and Electricity** Investigation 4, Parts 1-3

**Magnetism and Electricity FOSS Science Stories** pp. 20-29

### **Ideas and Inventions**

Investigation 4, Parts 1-3

Students work in collaborative groups of 2-4 in ALL FOSS Grades 3-6 modules. They also have opportunities to work alone, especially on end of module projects. See for example: **Human Body** Overview and Investigation 4, Parts 1-3

FOSS Web site: Careers section (for each module) See also:

**Water FOSS Science Stories** pp. 24-26 (Ellen Swallow Richards), 27-29 (moon)

### **Structures of Life FOSS Science Stories**

Pp. 6-9 (Barbara McClintock)

### **Physics of Sound FOSS Science Stories**

pp. 25-29 (hearing aid)

**Human Body FOSS Science Stories** pp. 5-7, 17-20

**Safety is a top priority in all FOSS modules.** See the safety poster and "Safety in the Classroom" section in the Overview of each FOSS teacher guide for general guidelines and an explanation of the safety goggle icon. See for example the icons in **Magnetism and Electricity** Investigation 1, Part 1. See also: **Human Body FOSS Science Stories** Pp. 3,5-7,14,17-20,25-27

<p><b>S3b:</b> identifies natural hazards in the environment.</p> <p><b>S3c:</b> recognizes that science and technology are used to identify ways to help solve social problems.</p> <p><b>S4. SCIENCE AND TECHNOLOGY</b></p> <p><b>The student demonstrates an understanding about science and technology, and the nature of technological design; that is, the student:</b></p> <p><b>S4a:</b> recognizes and explains how specific tools, technology and inventions assist humans to work efficiently or to live more conveniently.</p> <p><b>S4b:</b> explains how inventions and technology impact people and other living organisms.</p> <p><b>S4c:</b> explores/invents/designs possible solutions to an identified problem.</p>	<p><b>Measurement</b> FOSS Science Stories pp. 16-17</p> <p><b>Water</b> FOSS Science Stories pp. 1-2,10-11,17-29</p> <p><b>Water</b> FOSS Science Stories pp. 22-23</p> <p><b>Water</b> FOSS Science Stories pp. 24-26 (Ellen Swallow Richards – water quality)</p> <p><b>Structures of Life</b> FOSS Science Stories Pp. 4-5, 6-9 (food quality)</p> <p><b>Physics of Sound</b> FOSS Science Stories pp. 25-29 (hearing aid)</p> <p><b>Human Body</b> FOSS Science Stories pp. 5-7,17-20 (medical technology)</p> <p>FOSS Science Stories and the “Careers” section of fossweb.com feature scientists using science, technology and inventions to assist humans and other living organisms. See for example:</p> <p><b>Ideas and Inventions</b> Investigation 4, Parts 1-2 (mirrors)</p> <p><b>Ideas and Inventions</b> FOSS Science Stories pp. 1-3,10,17-18,21-22,28-29</p> <p><b>Water</b> FOSS Science Stories pp. 10-11,17-23, 24-26, 27-29</p> <p><b>Earth Materials</b> FOSS Science Stories Pp. 3,8-9,12-13,24-29</p> <p><b>Measurement</b> FOSS Science Stories pp. 1-6,8-9,14-15,21-23</p> <p><b>Ideas and Inventions</b> This standard is the focus of the last part of EACH investigation, such as Investigation 2, Part 3</p>
<p><b>S5. PHYSICAL SCIENCE</b></p> <p><b>The student demonstrates a conceptual understanding of matter, motion, and energy; that is, the student:</b></p> <p><b>S5a:</b> compares and contrasts observable properties of matter and their changing states.</p> <p><b>S5b:</b> explores the characteristics of matter.</p> <p><b>S5c:</b> describes and measures the position and motion of objects relative to other objects,</p>	<p><b>Earth Materials</b> Investigation 2, Parts 1-2</p> <p><b>Water</b> Investigation 3, Parts 1-4</p> <p><b>Physics of Sound</b> Investigation 3, Parts 1-2</p> <p><b>Water</b> Investigation 2, Parts 1-3</p> <p><b>Magnetism and Electricity</b> Investigation 1, Parts 1-4</p> <p><b>Earth Materials</b> Investigation 3, Parts 1-2</p> <p><i>This standard is addressed in <b>Variables, Levers and Pulleys, and Models and</b></i></p>

<p>time and distance.</p> <p><b>S5d:</b> identifies ways in which light interacts with matter (transmission, absorption, scattering).</p> <p><b>S5e:</b> investigates electricity and magnetism as forms of energy.</p> <p><b>S5f:</b> investigates how sound travels through liquids, solids and gases.</p> <p><b>S6: LIFE SCIENCE</b></p> <p><b>The student develops a conceptual understanding of organisms, and their environments; that is, the student:</b></p> <p><b>S6a:</b> explains the needs and behaviors of organisms and how organisms can adapt to their environment.</p> <p><b>S6b:</b> explains that an organism's characteristics are inherited from its parents and developed from interactions with the environment.</p> <p><b>S6c:</b> explores the different structures and functions of plants and animals.</p> <p><b>S6d:</b> explores why an ecosystem is essential to all living organisms.</p> <p><b>S6e:</b> compares and contrasts the different types of ecosystems.</p> <p><b>S7: EARTH AND SPACE SCIENCES</b></p> <p><b>The student demonstrates a conceptual understanding of Earth materials, objects in the sky, and changes in Earth and sky; that is, the student:</b></p>	<p><i>Designs, designed for Grades 5-6.</i></p> <p><b>Ideas and Inventions</b> Investigation 4, Parts 1-2 (light) <b><u>Ideas and Inventions FOSS Science Stories</u></b> pp. 23-27</p> <p><b>Magnetism and Electricity</b> – ALL, such as Investigation 4, Parts 1-3 electromagnets <b><u>Magnetism and Electricity FOSS Science Stories</u></b> pp. 1-29</p> <p><b>Physics of Sound</b> Investigation 3, Parts 1-2 and Home/School Extensions</p> <p><b>Structures of Life</b> Investigations 1-4 ALL <b><u>Structures of Life FOSS Science Stories</u></b> Pp. 1-3, 10-16,17-27,28 FOSS Web: Pictures</p> <p><b>Structures of Life</b> Investigation 2, Parts 1-3 <b><u>Structures of Life FOSS Science Stories</u></b> Pp. 6-9, 12-16, 17-25</p> <p><b>Structures of Life</b> – this is a focus of the entire module. See for example: Investigation 2, Parts 1-3 hydroponic beans Investigation 3, Parts 1-4 crayfish <b><u>Structures of Life FOSS Science Stories</u></b> pp. 1-3, 10-11, 12-16, 17-18, 24-25, <b>26-27</b></p> <p><b><u>Structures of Life FOSS Science Stories</u></b> Pp. 4-5, 12-16, 28 <b><u>Water FOSS Science Stories</u></b> pp. 5-7</p> <p><i>This standard is a focus of the FOSS Module <b>Environments</b>, designed for Grades 5-6.</i></p>
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<p><b>S7a:</b> observes the physical and chemical properties of Earth's materials including rocks, minerals, soils, water and fossils, as they relate to Earth's history.</p> <p><b>S7b:</b> describes properties, locations and movements of objects in the sky.</p> <p><b>S7c:</b> explains the processes that change the Earth, such as weather, erosion and sedimentation, earthquakes, and activity by volcanoes.</p> <p><b>S7d:</b> understands that astronomical objects in the sky are massive in size and separated from one another by vast distances.</p> <p><b>S7e:</b> discusses reasons for space exploration.</p>	<p><b>Earth Materials</b> ALL, such as Investigation 1, Parts 1-3 Investigation 2, Parts 1-2 <b>Earth Materials</b> FOSS Science Stories Pp. 1-4, 5-7,8-9,10-11,12-13,14-15,24-29 <b>Water</b> Investigation 1, Parts 1-4 Investigation 4, Parts 1-3 (includes soils) <b>Water</b> FOSS Science Stories pp. 1-4, 8-26</p> <p><i>Objects in the sky are observed and investigated in FOSS in <b>Air and Weather</b>, designed for Grades 1-2 and <b>Solar Energy</b> for Grades 5-6.</i></p> <p><i>This standard is a focus of <b>Landforms</b>, a FOSS Module designed for Grades 5-6.</i></p> <p><i>Objects in the sky are observed and investigated in FOSS in <b>Air and Weather</b>, designed for Grades 1-2, <b>Solar Energy</b> for Grades 5-6 and <b>Planetary Science</b> for Grades 6-8. Space exploration is discussed in Solar Energy, Planetary Science and <b>Earth History</b>, another FOSS Middle School module.</i></p>
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# DoDEA

## SCIENCE CONTENT STANDARDS

### GRADE FIVE

*FOSS modules are inquiry-based. The fundamentals of scientific inquiry are embedded in ALL FOSS modules at a developmentally appropriate level. Examples of investigations that address each standard are listed.*

<b>STANDARDS</b>	<b>FOSS Investigations</b>
<p><b>S1. SCIENTIFIC INQUIRY</b></p> <p><b>The student demonstrates abilities necessary to do scientific inquiry and an understanding about scientific inquiry; that is, the student:</b></p> <p><b>S1a:</b> asks questions about objects, organisms, and phenomena that can be answered through scientific investigations.</p> <p><b>S1b:</b> accesses, evaluates and uses information from a variety of sources.</p> <p><b>S1c:</b> designs and conducts scientific investigations based upon the nature of the questions asked.</p> <p><b>S1d:</b> employs appropriate tools and techniques to systematically collect, record, analyze, interpret and present data.</p> <p><b>S1e:</b> uses evidence from reliable sources to develop logical descriptions, predictions, explanations, and models.</p>	<p>Students ask questions, conduct investigations using simple equipment, use information from multiple sources, construct explanations and communicate results and conclusions throughout <u>ALL</u> FOSS modules. The examples listed below are representative, not an exhaustive listing.</p> <p><b>Environments</b> Investigation 5, Parts 1-3</p> <p><b>Mixtures and Solutions</b> Investigation 3, Parts 1-3</p> <p>This standard is met in each module through hands-on investigations, readings (including FOSS Science Stories), Home/School connections and accessing information on the Internet via FOSS Web. See for example:</p> <p><b>Landforms</b> Investigation 3, Parts 1-2 <b>Landforms</b> FOSS Science Stories pp. 15-21 FOSS Web site: <a href="http://www.fossweb.com">www.fossweb.com</a></p> <p>This standard is met through the hands-on investigations and especially in the end-of-module projects in ALL FOSS modules. See for example:</p> <p><b>Environments</b> Investigation 1, Parts 1-2 and Investigation 6, Part 3 <b>Variables</b> Investigation 3, Parts 1-4 and Investigation 4, Part 4</p> <p><b>Variables</b> Investigation 3, Parts 1-4</p> <p><b>Food and Nutrition</b> Investigation 2, Parts 1-3</p> <p><b>Mixtures and Solutions</b> Investigation 1, Part 4</p> <p><b>Food and Nutrition</b> Investigation 3, Parts 1-3 <b>Food and Nutrition</b> FOSS Science Stories pp. 20-26</p>

**S1f:** asks questions and queries about scientific knowledge.

**S1g:** communicates findings and conclusions of investigations using scientific language and mathematics.

## **S2: HISTORY AND NATURE OF SCIENCE**

**The student demonstrates an understanding of science as a human endeavor; and the history and nature of science, that is, the student:**

**S2a:** knows that doing science requires varying human abilities, interest and habits of mind (such as: reasoning, insight, skill, creativity, intellectual honesty, tolerance of ambiguity, skepticism and openness to new ideas).

**S2b:** describes examples of scientists working in teams and alone to solve problems.

**S2c:** explains the variety of contributions and discoveries about the objects, events, and phenomena in nature that were made by men and women who chose careers in science.

**S2d:** describes ways that scientists have used new evidence to make modifications to existing explanations.

## **S3. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**The student demonstrates an understanding of safety, risks and benefits associated with natural and personal hazards; that is, the student:**

**S3a:** demonstrates personal and group safety,

### **Models and Designs**

Investigation 1, Parts 1-3

**Models and Designs** FOSS Science Stories

pp. 1-16

**Variables** Investigation 2, Parts 1-3

**Mixtures and Solutions**

Investigation 2, Parts 1-4

**Mixtures and Solutions** FOSS Science

Stories pp. 11-15

www.fossweb.com

**Variables** Investigation 1, Parts 1-3

**Solar Energy**

Investigation 3, Parts 1-2

**Food and Nutrition**

Investigation 2, Parts 1-3

**ALL FOSS Science Stories** and also the **FOSS Web site (Careers section)** provide numerous examples of scientists working alone or together and displaying scientific habits of mind such as those listed in S2a; students are encouraged to practice the same ones as they go through the investigations. See for example:

**Models and Designs**

Investigation 1, Parts 1-3

**Models and Designs** FOSS Science Stories

pp. 1-16

**Mixtures and Solutions** FOSS Science

Stories pp. 10-15,22-33

**Food and Nutrition** FOSS Science Stories

pp. 9,21,24-25,26,34-36

**Landforms** FOSS Science Stories pp. 11-

14,22-24

**Environments** FOSS Science Stories pp. 39-

40,43-44

**Models and Designs** FOSS Science Stories

pp. 1-16

**Mixtures and Solutions** FOSS Science

Stories pp. 5,26-30 (Periodic table)

**Safety is a top priority in all FOSS modules.**

See the safety poster and "Safety in the Classroom" section in the Overview of each FOSS teacher guide for general guidelines and an explanation of the safety goggle icon. See for example the icons in

and resource conservation.

**S3b:** explores the personal and societal challenges caused by both natural hazards and hazards that result from human activities.

**S3c:** utilizes a systematic approach to analyze risks and benefits associated with natural and personal hazards.

**S3d:** compares the positive and negative impacts of technological advances on society

#### **S4. SCIENCE AND TECHNOLOGY**

**The student demonstrates an understanding about science and technology, and the nature of technological design; that is, the student:**

**S4a:** demonstrates understanding of how tools and technology advance scientific investigations and knowledge.

**S4b:** uses technology to assist in the design of solutions to the identified problems.

**S4c:** determines criteria to evaluate the effectiveness of the solution.

**S4d:** evaluates an invention that solves a problem and determines ways to improve the design.

#### **S5. PHYSICAL SCIENCE**

**The student demonstrates a conceptual understanding of matter, motion, and energy; that is, the student:**

**S5a:** explains how materials may be composed of parts that are too small to be seen without magnification.

**S5b:** explores composition of matter.

**Mixtures and Solutions** Investigation 4, Parts 1-3

Conservation is stressed in the Teacher Guide for **each** FOSS Module.

See for example:

**Models and Designs**

Investigation 2, Parts 1-3 (parts are re-used)

**Landforms** FOSS Science Stories pp. 27-34, 43-44

**Environments** FOSS Science Stories pp. 11-14,22-24

**Solar Energy** FOSS Science Stories pp.12-15, 20

**Models and Designs** FOSS Science Stories pp.1-4, 17-20,25-40

**Solar Energy** FOSS Science Stories pp. 4-5, 15, 16-17,22-32

**Variables**

Investigation 3, Parts 1-4

**Variables** FOSS Science Stories pp. 15-33

**Models and Designs** FOSS Science Stories pp.1-4, 17-20,25-40

**Mixtures and Solutions** Investigation 1, Parts 1-4 (funnels and screens)

**Solar Energy**

Investigation 4, Parts 1-3

**Food and Nutrition** Investigation 2, Parts 1-3 (air pistons and volume tubes)

**Models and Designs**

Investigation 2, Parts 1-3 humdingers

**Mixtures and Solutions**

Investigation 4, Parts 1-3

**Mixtures and Solutions** FOSS Science Stories pp. 5,26-30 (Periodic table)

**Models and Designs** FOSS Science Stories

<p><b>S5c:</b> describes and explains the physical and chemical changes when substances are combined.</p> <p><b>S5d:</b> explains, measures, and predicts the relationship between the strength of a force and its effect on the motion of an object.</p> <p><b>S5e:</b> understands that energy occurs in different forms (heat, light, electrical, solar, magnetic, and nuclear) and that energy can change forms.</p> <p><b>S6: LIFE SCIENCE</b></p> <p><b>The student demonstrates a conceptual understanding of the structure and function of living systems, populations and ecosystems; that is, the student:</b></p> <p><b>S6a:</b> explores the cell as the basic structure of all living organisms.</p> <p><b>S6b:</b> explores the organization of cells into tissues, organs, and systems, including the structures and functions.</p> <p><b>S6c:</b> explores the flow of energy and matter in ecosystems.</p> <p><b>S6d:</b> compares adaptations of organisms in response to changes in the environment.</p> <p><b>S6e:</b> explains interactions within ecosystems.</p> <p><b>S6f:</b> recognizes why living organisms are classified into groups.</p> <p><b>S7: EARTH AND SPACE SCIENCES</b></p>	<p>p. 4 (DNA)</p> <p><b>Mixtures and Solutions</b> Investigation 4, Parts 1-3 <b>Mixtures and Solutions FOSS Science Stories</b> pp. 1-6, <b>21-22</b>, 26-30 FOSS Web Movie: Physical and Chemical Changes <b>Food and Nutrition</b> Investigation 2, Parts 1-3</p> <p><b>Levers and Pulleys</b> ALL, including Investigation 3, Parts 1-3 <b>Models and Designs</b> Investigation 4, Parts 1-2 go-carts <b>Variables</b> Investigation 3, Parts 1-4 planes</p> <p><b>Solar Energy</b> ALL, including Investigation 3, Parts 1 and 2 <b>Solar Energy FOSS Science Stories</b> pp. 1-4, 16-17, 22-32 <b>Models and Designs</b> Investigation 2, Parts 1-3 humdingers <i>Note: magnetic energy is explored in <b>Magnetism and Electricity</b>, designed for Grades 3-4.</i></p> <p><i>This standard is addressed in depth in <b>Diversity of Life</b>, a FOSS Middle School module designed for Grades 6-8.</i></p> <p><b>Environments</b>, Investigation 1, Parts 1-2 and <b>Environments FOSS Science Stories</b> pp. 9-17, 27-36, 39-41</p> <p><b>Environments</b>, Investigation 5, Parts 1-3 (brine shrimp) <b>Environments FOSS Science Stories</b> pp. 2-8, 14-17, 18-21, 22, 25-26, 31-35, 38</p> <p><b>Environments</b>, Investigation 2, Part 4 <b>Environments FOSS Science Stories</b> pp. 1-8, 9-17, 27-36, <b>39-41</b></p> <p><b>Environments</b>, Investigation 2, Parts 1-3 <b>Environments FOSS Science Stories</b> pp. 18-22, 23-26</p>
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**The student demonstrates a conceptual understanding of Earth's systems, history, and significance in the solar system; that is, the student:**

**S7a:** discusses factors that reshape the land surfaces of the Earth, such as wind, water, ice and waves.

**S7b:** describes motion, orbit and rotation of planets and moons in our solar system.

**S7c:** identifies and describes the constellations.

**S7d:** describes ways in which space exploration has increased our understanding of the solar system.

**Landforms**, Investigation 2, Parts 1-2  
Investigation 3, Parts 1-3  
Landforms FOSS Science Stories pp. 13-24,27-34

*This standard is addressed very thoroughly in **Planetary Science**, a FOSS module designed for Grades 6-8.*

**Models and Designs** FOSS Science Stories  
pp.5-10, 17-20,39-40

**Solar Energy** FOSS Science Stories pp. 4-5, 15

*This standard is also addressed in depth in **Planetary Science**, a FOSS Module designed for Grades 6-8.*

**DoDEA  
SCIENCE CONTENT STANDARDS**

**INTEGRATED SCIENCE I (Grade 6)**

Examples of investigations and readings meeting each of the benchmarks are listed from the original FOSS modules designed for **Grades 5-6 (Environments, Food and Nutrition, Mixtures and Solutions, Levers and Pulleys, Landforms, Solar Energy, Variables, and Models and Designs)** and from the nine FOSS Middle School Courses for grades 6-8. Of the courses, **Human Brain and Senses, Earth History, Planetary Science, Electronics, Diversity of Life, Weather and Water, and Populations and Ecosystems** are completed and included fully in the correlation. The other Middle School Courses, ***Force and Motion*** and ***Chemistry*** are in various stages of development and are included *in italics* where their correlation is anticipated.

*FOSS modules are inquiry-based and will easily meet the requirement of at least 30% of class time spent in laboratory exercises. The fundamentals of scientific inquiry are embedded in ALL FOSS modules.*

*Representative examples of activities meeting each standard are listed.*

<b>STANDARDS</b>	<b>FOSS</b>
<p><b>A. INQUIRY SKILLS</b></p> <p><b><u>Students will design and conduct scientific investigations</u></b></p> <p>Identify questions that can be answered through scientific investigations</p> <p>Use appropriate tools, technology, and techniques to gather, analyze, and interpret data</p> <p>Organize and maintain a journal showing procedures and results of investigations</p> <p>Develop descriptions, explanations, predictions, and models using evidence</p>	<p><b>Levers and Pulleys</b> Investigation 1, Parts 1-3</p> <p><b>Diversity of Life</b> Investigation 6, Parts 1-3</p> <p><b>Earth History</b> Investigation 8, Part 4</p> <p><b>Food and Nutrition</b> Investigation 3, Parts 1-3</p> <p><b>Weather and Water</b> Investigation 4, Parts 1-2</p> <p><b>Solar Energy</b> Lab notebook masters for Investigations 1-4</p> <p><b>Diversity of Life</b> Overview p. 3 and Lab Notebook masters</p> <p><b>Planetary Science</b> Overview p. 3 and Lab Notebook masters</p> <p><b>Models and Designs</b> Investigation 2, Parts 1-3</p> <p><b>Weather and Water</b> Investigation 1, Parts 1-5</p>

<p>Use mathematics in scientific inquiry</p>	<p><b>Solar Energy</b> Investigation 3, Parts 1-2  <b>Food and Nutrition</b> Investigation 2, Parts 1-3  <b>Populations and Ecosystems</b> Investigation 6, Parts 1-3  <b>Human Brain and Senses</b> Investigation 8, Parts 1-2  <b>Planetary Science</b> Investigation 5, Parts 5-7</p>
<p>Construct logical relationships between evidence and explanations</p>	<p><b>Levers and Pulleys</b> Investigation 3, Parts 1-3  <b>Human Brain and Senses</b> Investigation 5, Parts 1-4  <b>Diversity of Life</b> Investigation 1, Parts 1-2</p>
<p>Recognize and analyze alternative explanations and prediction</p>	<p><b>Models and Designs</b> Investigation 1, Parts 1-3  <b>Diversity of Life</b> Investigation 8, Parts 1-3  <b>Earth History</b> Investigation 1, Parts 1-2</p>
<p>Use fair testing procedures</p>	<p><b>Food and Nutrition</b> Investigation 1, Parts 1-2  <b>Planetary Science</b> Investigation 5, Parts 1-4</p>
<p><b><u>Students will communicate scientific procedures and explanations</u></b></p>	<p>This standard is met in <b>Lab Notebooks</b> for <b>ALL Grades 5-6 and FOSS Middle School modules</b>. See for example:</p>
<p>Demonstrate effective methods to organize and display science data and concepts</p>	<p><b>Models and Designs</b> Investigation 3, Parts 1-3  <b>Levers and Pulleys</b> Investigation 1, Parts 1-2  <b>Earth History</b> Investigation 3, Part 2</p>
<p>Present investigative results to others verbally, graphically, and in writing</p>	<p><b>Variables</b> Investigation 1, Parts 2-3  <b>Levers and Pulleys</b> Investigation 1, Parts 1-3  <b>Diversity of Life</b> Investigation 6, Parts 1-3</p>
<p>Communicate accurately and clearly about science concepts, using scientific vocabulary</p>	<p>This standard is met throughout ALL of the FOSS modules and is particularly evident in the end-of-module projects and presentations. See for example:  <b>Solar Energy</b> Investigation 4, Parts 1-4  <b>Planetary Science</b> Investigation 10, Part 3</p>
<p><b>B. PHYSICAL SCIENCE</b></p>	<p><b>Human Brain and Senses</b> Investigation 9, Part 2</p>
<p><b><u>Students will apply the principles of motion and forces</u></b></p>	
<p>Design and conduct investigations to calculate the speed (rate of travel) of moving objects</p>	<p><b>Models and Designs</b> Investigation 4, Parts 1-2</p>
<p>Explain how changes of position over time</p>	<p><i>These standards will be addressed in greater detail in <b>Force and Motion</b>, still under</i></p>

<p>determine the speed of moving objects</p> <p>Demonstrate how objects have potential and/or kinetic energy</p> <p>Compare the interactions of balanced and unbalanced forces, action and reaction</p> <p><b><u>Students will explain the transfer of energy</u></b></p> <p>Demonstrate how energy is transferred (examples: electrical energy to mechanical energy, mechanical energy to electrical energy)</p> <p>Construct both series and parallel circuits and trace the flow of electrical energy through each</p> <p>Describe how electrical energy is transferred to produce heat, light, sound, mechanical and chemical energy (examples: Dry cell battery, electroplating, nickel-cadmium rechargeable battery)</p>	<p><i>development at the Lawrence Hall of Science</i></p> <p><b><i>Force and Motion</i></b></p> <p><b><i>Force and Motion</i></b></p> <p><b>Solar Energy</b> Investigation 2, Parts 1-2 (heat energy transfer)  <b>Electronics</b>  Investigation 1, Parts 1-3  <b>Electronics Resources</b> pp. 9, 23-25  <i>This standard will also be addressed in greater detail in <b>Force and Motion</b>, still under development at the Lawrence Hall of Science</i></p> <p><b>Electronics</b>  Investigation 1, Part 3  Investigation 5, Parts 1-3</p> <p><b>Electronics</b>  Investigation 1, Parts 1-3  Investigation 4, Part 2  <b>Electronics Resources</b> pp. 1-3, 12-14, 18-21, 23-25</p>
<p><b>C. LIFE SCIENCE</b></p> <p><b><u>Students will analyze the relationship between structure and function</u></b></p> <p>Compare the cellular, tissue, organ, and system organizations of animals and plants</p> <p>Explain the structure and functions of the circulatory and respiratory systems</p> <p><b><u>Students will explain reproduction and heredity</u></b></p> <p>Compare asexual and sexual reproduction</p> <p>Describe human reproduction and</p>	<p><b>Diversity of Life</b>  Investigation 4, Parts 1-2  <b>Diversity of Life Resources</b> pp. 8-9, 27-30, 31-39, 64-70  Diversity of Life CD-ROM  <b>Human Brain and Senses Resources</b>  Pp. 59-72</p> <p><b>Diversity of Life Resources</b> pp.55-59 (insects)</p> <p><b>Diversity of Life Resources</b> pp. 40-45, 46-50, 53-54, 61-64  <b>Populations and Ecosystems</b>  Investigation 1, Parts 1-3  Investigation 6, Parts 1-3</p>

<p>development of the fetus</p> <p>Compare traits that are inherited with traits that are learned</p> <p><b><u>Students will explain how populations relate to ecosystems</u></b></p> <p>Identify the energy relationships between producers, consumers, and decomposers in an ecosystem</p> <p>Describe ways that different species respond to each other within the same ecosystem</p> <p>Compare organisms that perform the same function in different ecosystems</p> <p><b><u>Students will describe the diversity and adaptations of organisms within an ecosystem</u></b></p> <p>Explain theories for the extinction of organisms</p> <p>Describe how environmental changes may cause endangerment and extinction</p> <p>Explain adaptive characteristics of species determine their chance for survival or possible extinction</p> <p>Defend the argument that most species that once lived on earth no longer exist</p> <p>Investigate modern day efforts to prevent the extinction of plants and animals</p> <p><b>D. EARTH AND SPACE SCIENCES</b></p> <p><b><u>Students will understand structures of the Earth system</u></b></p>	<p><b><u>Environments</u></b> FOSS Science Stories pp. 28, 34, 39-41</p> <p><b>Populations and Ecosystems</b> Investigation 4, Parts 1-2 Investigation 5, Parts 1-4 <b><u>Populations and Ecosystems Resources</u></b> Pp. 14-16, 17-21</p> <p><b>Populations and Ecosystems</b> Investigation 2, Parts 1-2 Investigation 3, Parts 1-3 Investigation 7, Parts 1-2 <b><u>Populations and Ecosystems Resources</u></b> pp. 22-24, 25-29, 30-41 Populations and Ecosystems CD-ROM</p> <p><b><u>Planetary Science Resources</u></b> pp. 67-68 <b><u>Earth History Resources</u></b> p. 85 <b>Populations and Ecosystems</b> Investigation 8, Parts 1-2 Investigation 9, Parts 1-4 Investigation 10, Parts 1-3</p> <p><b><u>Planetary Science Resources</u></b> pp. 67-68 <b><u>Earth History Resources</u></b> p. 85 <b>Populations and Ecosystems</b> Investigation 8, Parts 1-2 Populations and Ecosystems CD-ROM</p> <p><b>Populations and Ecosystems</b> Investigation 8, Parts 1-2 Populations and Ecosystems CD-ROM <b><u>Diversity of Life Resources</u></b> pp. 42-43,55-59</p> <p><b><u>Populations and Ecosystems Resources</u></b> p. 61</p>
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<p>Design and construct a model to explain the water cycle</p> <p>Differentiate between weather and climate</p> <p>Explain the importance of the oceans in forming weather patterns and how this affects climate</p> <p><b><u>Students will explain the Earth's position in the solar system</u></b></p> <p>Create a 3 dimensional model to demonstrate the relationship of Earth to the sun and moon</p> <p>Infer that the angle of the sun's rays is responsible for temperature changes during the seasons</p> <p>Describe objects that enter the solar system from the outside (examples: comets, meteorites, micrometeorites)</p> <p>Explain solar and lunar eclipses</p>	<p><b>Weather and Water</b> Investigation 7, Parts 1-2 Weather and Water CD-ROM</p> <p><b>Weather and Water</b> Investigation 1, Parts 1-2 Investigation 9, Parts 1-3 <b>Weather and Water Resources</b> p. 64</p> <p><b>Solar Energy</b> FOSS Science Stories Pp. 18-21 <b>Weather and Water</b> Investigation 9, Parts 1-3</p> <p><b>Planetary Science</b> Investigation 3, Parts 1 and 2 Investigation 9, Part 2</p> <p><b>Weather and Water</b> Investigation 3, Parts 1-3 Weather and Water CD-ROM <b>Weather and Water Resources</b> pp. 12-19</p> <p><b>Planetary Science Resources</b> pp. 59-68, 72, 84-89, 101-103</p> <p><b>Planetary Science</b> Investigation 3, Parts 1 and 2</p>
<p><b>E. SCIENCE AND TECHNOLOGY</b></p> <p><b><u>Students will demonstrate ability in technological design</u></b></p> <p>Identify products or examples of technology that are commonly used</p> <p>Design and conduct a product test using clearly stated criteria</p> <p>Based on evaluations, determine ways to improve the product test design</p> <p>Communicate the methods and procedures used for the product test</p> <p><b><u>Students will explain why science and technology are interdependent</u></b></p>	<p><b>Models and Designs</b> FOSS Science Stories pp. 23-40 <b>Levers and Pulleys</b> Investigation 2, Parts 3-4 <b>Levers and Pulleys</b> FOSS Science Stories Pp. 9-13 <b>Electronics</b> Investigation 4, Parts 1-2 <b>Electronics Resources</b> pp. 1-2,18-21,23-25,34-36</p> <p><b>Food and Nutrition</b> Investigation 3, Parts 1-3 Vitamin C testing <b>Models and Designs</b> Investigation 3, Parts 1-2 go-carts <b>Solar Energy</b> Investigation 4, Parts 1-2 solar houses Investigation 4, Part 4 projects (such as solar cookers) <i>This standard will also be addressed in the FOSS Middle School Module <b>Force and Motion</b>, still under development at the Lawrence Hall of Science.</i></p>

<p>Describe how technology is constantly changing (examples: computers, medical equipment, automobiles)</p> <p>Compare the intended benefits and unintended consequences of a technology</p> <p><b>F. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES</b></p> <p><b><u>Students will practice safety</u></b></p> <p>Demonstrate personal and group safety when engaged in science activities</p> <p>Demonstrate the safe use of electricity in the home and school</p> <p>Describe safety precautions needed during natural hazards (examples: fires, earthquakes, electrical storms, and tornadoes)</p> <p><b><u>Students will evaluate risks and benefits</u></b></p> <p>Evaluate the risks, costs, and benefits of human decisions related to natural hazards (examples: fires, earthquakes, floods, and tornadoes)</p> <p>Investigate how students' actions could have an impact on world environmental concerns</p> <p><b>G. HISTORY AND NATURE OF SCIENCE</b></p>	<p><b><u>Models and Designs</u></b> FOSS Science Stories pp. 1-40</p> <p><b><u>Levers and Pulleys</u></b> FOSS Science Stories pp. 9,13-15,23-25</p> <p><b>Human Brain and Senses</b> Investigation 5, Parts 1-4</p> <p><b><u>Human Brain and Senses</u></b> Resources Pp. 3-8, 19-20, 34-35, 47-49 Human Brain and Senses CD-ROM</p> <p><b><u>Planetary Science</u></b> Resources pp. 74-77, 90-95</p> <p><b><u>Electronics</u></b> Resources pp. 1-2,18-21,23-25,34-36</p> <p>Safety is a top priority in FOSS. General safety guidelines are outlined in the Overview section of EACH FOSS teacher guide. Specific safety issues related to each lesson are listed in the lesson plan and denoted with a safety goggle icon in the margin. See for example: <b>Weather and Water</b> Investigation 2, Part 1</p> <p><b><u>Electronics</u></b> Resources pp. 12-14 and Teacher Guide p. 25</p> <p><b><u>Electronics</u></b> Resources pp. 12-14 and Teacher Guide p. 25 <b>Weather and Water</b> Investigation 1, Parts 1-2 including weather video Weather and Water CD-ROM <b><u>Weather and Water</u></b> Resources pp. 67-76 and discussion</p> <p><b><u>Solar Energy</u></b> FOSS Science Stories Pp. 18-21 <b><u>Electronics</u></b> Resources pp. 12-14 and Teacher Guide p. 25 <b>Weather and Water</b> Investigation 1, Parts 1-2 including weather video Weather and Water CD-ROM <b><u>Weather and Water</u></b> Resources pp. 67-76 and discussion</p> <p><b><u>Solar Energy</u></b> FOSS Science Stories Pp. 22-32 <b>Weather and Water</b> Investigation 9, Parts 1-4 Weather and Water CD-ROM <b><u>Weather and Water</u></b> Resources pp. 45-47, 63-66</p> <p><b><u>FOSS Science Stories</u></b> for Grades 5-6 and</p>
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**Students will understand that science is a human endeavor**

Identify contributions of individuals from other cultures who have contributed to knowledge in science, technology, and engineering

Determine types of educational choices required for science and technology careers

**Students will understand the nature of scientific work and the cooperation between scientists**

Describe methods that scientists use to formulate and test their explanations

Cite examples of scientists who have used new evidence to make modifications on existing explanations

Describe the roles of scientists who have worked in teams to solve a problem or make a scientific discovery (examples; space shuttle team, atomic energy, DNA)

Explain how scientists communicate the results of their work

**Students will describe events in the history of science**

Describe the work of scientists whose discoveries were ahead of their day

Describe the scientific contributions of ancient societies (examples: Egyptians, Chinese, and Arabs)

Resources books for FOSS Middle School and the "Careers" section of fossweb.com feature scientists throughout. Care is taken to show people of different backgrounds, males and females, using science and technology to answer questions and solve problems. See for example:

**Solar Energy** FOSS Science Stories

Pp. 25, 26-27

**Planetary Science** Resources pp. 52-53, 59-62, 67-68, 71-73

**Diversity of Life** Resources pp. 8-13

**Earth History** Resources pp. 75, 98-99

**Solar Energy** FOSS Science Stories

Pp. 25, 26-27

**Models and Designs** FOSS Science Stories pp. 1-16, 37-40

**Planetary Science** Resources pp. 52-53, 59-62, 67-68, 71-73

**Diversity of Life** Resources pp. 8-13

**Earth History** Resources pp. 75, 83-84, 98-99

This standard is addressed in Lab Notebooks used in EACH module for Grades 5-6 and FOSS Middle School. It is also modeled carefully in **Models and Designs** Investigation 1, Parts 1-2.

**Models and Designs** FOSS Science Stories

pp. 4, 6-10

**Earth History** Investigation 2, Parts 1-2

**Earth History** Resources pp. 50-59

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

**Models and Designs** FOSS Science Stories

p. 6

**Solar Energy** FOSS Science Stories p. 9

**Planetary Science** Resources pp. 52-53, 54-58

*Note: this standard is also addressed in readings in **Earth Materials** designed for Grades 3-4.*

**DoDEA  
SCIENCE CONTENT STANDARDS**

**INTEGRATED SCIENCE II (Grade 7)**

Examples of investigations and readings meeting each of the benchmarks are listed from the nine FOSS Middle School Courses for grades 6-8. Of the courses, **Human Brain and Senses, Earth History, Planetary Science, Electronics, Diversity of Life, Weather and Water, and Populations and Ecosystems** are completed and included fully in the correlation. The other Middle School Courses, ***Force and Motion*** and ***Chemistry*** are in various stages of development and are included *in italics* where their correlation is anticipated.

*FOSS modules are inquiry-based and will easily meet the requirement of at least 30% of class time spent in laboratory exercises. The fundamentals of scientific inquiry are embedded in ALL FOSS modules.*

Representative examples of activities meeting each standard are listed.

<b>STANDARDS</b>	<b>FOSS</b>
<p><b>A. INQUIRY SKILLS</b></p> <p><b><u>Students will design and conduct scientific investigations</u></b></p> <p>Identify questions that can be answered through scientific investigations</p> <p>Use appropriate tools, technology, and techniques to gather, analyze, and interpret data</p> <p>Organize and maintain a journal showing procedures and results of investigations</p> <p>Use mathematics in scientific inquiry</p> <p>Use logic and evidence to formulate scientific explanations, models, and predictions</p>	<p><b>Populations and Ecosystems</b> Investigation 5, Parts 1-4</p> <p><b>Earth History</b> Investigation 8, Part 4</p> <p><b>Electronics</b> Investigation 7, Part 2</p> <p><b>Earth History</b> Investigation 4, Part 3</p> <p>ALL FOSS Middle School modules involve students recording and organizing data in Lab Notebooks. See for example:</p> <p><b>Planetary Science</b> Teacher Guide p.10 and Lab Notebook masters</p> <p><b>Earth History</b> Teacher Guide p.12 and Lab Notebook masters</p> <p><b>Populations and Ecosystems</b> Investigation 6, Parts 1-3</p> <p><b>Planetary Science</b> Investigation 7, Parts 1-2</p> <p><b>Human Brain and Senses</b> Investigation 7, Parts 1 and 2</p>

<p>Identify alternative explanations and models based on scientific knowledge, logic, and experimental evidence</p> <p>Demonstrate understanding about scientific inquiry</p> <p>Use fair testing procedures</p> <p><b><u>Students will communicate and defend scientific arguments</u></b></p> <p>Demonstrate effective methods to organize and display science data and concepts</p> <p>Present investigative procedures and results to others verbally, graphically, and in writing</p> <p>Communicate accurately and clearly about science concepts, using scientific vocabulary</p> <p><b>B. PHYSICAL SCIENCE</b></p> <p><b><u>Students will distinguish properties of matter and changes in properties of matter</u></b></p> <p>Conduct investigations to compare chemical properties (examples: acidity, basicity,</p>	<p><b>Populations and Ecosystems</b> Investigation 9, Parts 1-4</p> <p><b>Electronics</b> Investigation 2, Part 1</p> <p><b>Earth History</b> Investigation 1, Parts 1-2</p> <p><b>Planetary Science</b> Investigation 5, Parts 1-3</p> <p>This standard can be addressed through Lab Notebook entries, teacher observation and formal Assessment. Many options are included in the Assessment section of the Teacher Guide. See for example:</p> <p><b>Diversity of Life</b> Investigation 6, Parts 1-3 and Assessment section</p> <p><b>Earth History</b> Investigation 3, Parts 1-4 and Assessment section</p> <p><b>Human Brain and Senses</b> Investigation 4, Parts 1-3</p> <p><b>Planetary Science</b> Investigation 5, Parts 1-3</p> <p><b>Electronics</b> Investigation 6, Part 3</p> <p><b>Earth History</b> Investigation 4, Part 2</p> <p><b>Planetary Science</b> Investigation 10, Part 3</p> <p><b>Diversity of Life</b> Investigation 8, Parts 1-2</p> <p>This standard can be addressed through Lab Notebook entries and small group/classroom discussion and also through the end-of-module projects suggested for many modules. See for example:</p> <p><b>Planetary Science</b> Investigation 9, Part 2</p> <p><b>Human Brain and Senses</b> Investigation 9, Part 2</p> <p><i>This standard will be addressed in <b>Chemistry</b>, a FOSS Middle School module</i></p>
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<p>reactivity)</p> <p>Compare physical properties of substances (examples: shape, density, solubility, odor, melting point, boiling point, color)</p> <p>Investigate how matter is changed with the addition or removal of heat</p> <p>Explain the relationship between heat and temperature</p> <p>Describe how heat and temperature relate to states of matter (solids, liquids, gases)</p> <p>Demonstrate the conservation of matter in chemical reactions</p> <p><b><u>Students will explain principles related to transfer of energy</u></b></p> <p>Compare how energy is produced in a fossil fuel versus an alternate energy power plant</p> <p>Investigate chemical reactions that transfer energy to different forms (examples: heat, light, mechanical, sound, electrical)</p> <p>Design and construct a battery and describe how energy flows within the battery</p> <p>Compare chemical energy to other types of energy</p> <p>Examine the potential hazards of commercial energy production</p>	<p><i>still under development at the Lawrence Hall of Science.</i></p> <p><i>This standard will be addressed in <b>Chemistry</b>, a FOSS Middle School module still under development at the Lawrence Hall of Science.</i></p> <p><b>Earth History</b> Investigation 4, Part 2 CD-ROM: Rock Database</p> <p><b>These standards will be addressed in Chemistry, a FOSS Middle School module still under development at the Lawrence Hall of Science.</b></p> <p><b>Weather and Water</b> Investigation 6, Parts 1-3 Investigation 7, Parts 1-2 Weather and Water CD-ROM <u>Weather and Water Resources</u> pp. 53-55</p> <p><i>These standards will be addressed in <b>Chemistry</b>, a FOSS Middle School module still under development at the Lawrence Hall of Science.</i></p>
<p><b>C. LIFE SCIENCE</b></p> <p><b><u>Students will analyze the relationship between structure and function in living organisms</u></b></p> <p>Describe cell structures and their functions</p> <p>Relate specialized cell functions to needs of</p>	<p><i>These standards will be addressed in <b>Chemistry</b>, a FOSS Middle School module still under development at the Lawrence Hall of Science.</i></p> <p><b>Diversity of Life</b> Investigation 3, Parts 1-2 Investigation 4, Parts 1-2</p>

<p>organisms</p> <p>Examine tissues to identify the characteristics of cell specialization</p> <p>Describe the structures and functions of the organs of the nervous and endocrine systems</p> <p>Explain how organs communicate and interact with each other</p> <p><b><u>Students will explain reproduction and heredity</u></b></p> <p>Determine the adaptive advantages of organisms that reproduce sexually and asexually</p> <p>Conduct investigations with plants and invertebrates to show how sexual reproduction uses egg and sperm to produce offspring</p> <p>Conclude that each organism receives physical and behavioral characteristics from its ancestors</p> <p><b><u>Students will understand the ways living organisms maintain and regulate behavior</u></b></p> <p>Describe the internal and external responses necessary for organisms to survive in their environments</p> <p>Compare survival mechanisms of different organisms</p>	<p><u>Diversity of Life Resources</u> pp. 8-9, 27-30, 31-39, 64-70 Diversity of Life CD-ROM</p> <p><b>Diversity of Life</b> Investigation 4, Part 2 Investigation 6, Part 2 <u>Diversity of Life Resources</u> pp. 32,37-39 Diversity of Life CD-ROM</p> <p><b>Human Brain and Senses</b> Investigation 2, Parts 1-3 Investigation 5, Parts 1-4 <i>Human Brain and Senses Resources</i> Pp. 3-16, 29-30,36,45-46, 63-74 CD-ROM: Head: Brain and Senses</p> <p><b>Human Brain and Senses</b> Investigation 8, Parts 1 and 2 <i>Human Brain and Senses Resources</i> Pp. 60-62,63-79</p> <p><b>Diversity of Life</b> Investigation 8, Parts 1-3 snails <u>Diversity of Life Resources</u> pp. 40-45, 46-50, 53-54, 61-64</p> <p><b>Populations and Ecosystems</b> Investigation 1, Parts 1-3 Investigation 6, Parts 1-3 Investigation 9, Parts 1-4 Investigation 10, Parts 1-3</p> <p><b>Diversity of Life</b> Investigation 7, Parts 1-2 <u>Diversity of Life Resources</u> pp. 40-45</p> <p><b>Populations and Ecosystems</b> Investigation 6, Parts 1-3 Investigation 9, Parts 1-4</p> <p><b>Diversity of Life</b> Investigation 6, Parts 1-3 <u>Diversity of Life Resources</u> pp. 21-23,24-26,37-39,40-45, 46-50, 51-54, 55-64</p> <p><b>Diversity of Life</b> Investigation 6, Parts 1-3 Investigation 8, Parts 1-3 Investigation 9, Parts 1-3 <u>Diversity of Life Resources</u> pp. 46-50,55-64</p> <p><b>Populations and Ecosystems</b> Investigation 3, Parts 2-3 Investigation 4, Parts 1-2 Populations and Ecosystems CD-ROM</p>
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Explain the importance of regulation and adaptation to an organism's survival

**Students will compare the effects of populations on ecosystems**

Investigate the processes by which sunlight is converted to food

Diagram how energy is passed in food webs

Explain energy transfer through the use of a pyramid model

Analyze how abiotic factors (examples: light, water, climate, soil nutrients) and biotic factors (examples: predators, competitors and disease) affect populations

**D. EARTH AND SPACE SCIENCE**

**Students will describe the structures of the Earth system**

Compare catastrophic forces with forces that cause gradual changes in the Earth's surface (examples: gravity, heat transfer, erosion, weathering, deposition, earthquakes, volcanoes, glaciers, floods)

Explain how living organisms have altered the Earth's atmosphere

Compare the different layers of the Earth's atmosphere

Describe the role of water in dissolving minerals and gases in transporting materials to the oceans

Investigate types of resources found in the oceans

**Human Brain and Senses Resources**

Pp. 40-42

**Populations and Ecosystems**

Investigation 8, Parts 1-2

**Diversity of Life Resources** p. 36

**Populations and Ecosystems**

Investigation 5, Part 2

Populations and Ecosystems Resources pp. 14-16,17,21

**Populations and Ecosystems**

Investigation 4, Parts 1-2

Investigation 5, Parts 1-4

Populations and Ecosystems Resources pp. 14-16,17-21

**Populations and Ecosystems**

Investigation 3, Parts 1-3

Investigation 6, Parts 1-3

Investigation 7

Populations and Ecosystems Resources

Pp. 8-13, 22-24,25-29,64-68

**Earth History**

Investigation 4, Part 3

Earth History Resources pp.100-105

CD-ROM: Earth Processes

**Weather and Water** Investigation 1, Parts 1-2 including weather video

Weather and Water CD-ROM

Weather and Water Resources pp. 67-76 and discussion

**Weather and Water Resources** pp. 6-7

**Diversity of Life Resources** pp. 65-66

**Weather and Water** Investigation 1, Parts 1-2 including weather video

Investigations 2, Parts 1-2

Weather and Water CD-ROM

Weather and Water Resources pp. 6-7,8-11

**Earth History**

Investigation 4, Parts 3-4

Earth History Resources pp. 64-72

Create topographic models and explain the topography of landforms and bodies of water

**Students will interpret evidence of the Earth's history**

Investigate how scientists derive information about the history of the Earth (examples: fossils, rock formations, volcanic activity, glacial activity)

Determine why knowledge about the Earth's history is important

**Students will understand how Earth relates to the solar system**

Describe how the position and motion of the Earth explains the seasons, length of daylight and the elevation of the sun

Create a model that accurately represents components of our Solar System

Explain the effects of the sun on the Earth's surface (examples: organisms, weather, seasons, wind, and ocean currents)

**E. SCIENCE AND TECHNOLOGY**

**Students will demonstrate abilities in technological design**

Design and construct a solution to an identified problem

Determine the effectiveness of the solution

Design and conduct an investigation to determine the quality of commercial products (examples; orange juice, paper towels)

**Earth History**

Investigation 3, Part 3  
Earth History Resources p. 36  
CD-ROM: Modern Environments

**Earth History ALL**

Investigations 1-8  
Earth History Resources pp. 28,34,50-59,60-62,**64-67**,73-80, 83-88,**98-99**  
CD: Geology Lab

**Earth History**

Teacher Guide Overview pp. 7-8  
Earth History Resources pp. 76-88  
CD: Earth Processes, Time Room

**Planetary Science**

Investigation 3, Parts 1-2  
CD-ROM: Day and Night  
Planetary Science Resources p. 38

**Weather and Water**

Investigation 3, Parts 1-3  
Weather and Water Resources pp. 17-19

**Planetary Science**

Investigation 3, Parts 1- 2  
Investigation 7, Part 2  
Investigation 9, Part 2

**Weather and Water**

Investigation 3, Parts 1-3  
Investigation 4, Parts 1-2  
Investigation 5, Parts 1-3  
Investigation 7, Parts 1-2  
Weather and Water Resources pp. 17-19, 22-33,53-55,63-66  
Weather and Water CD-ROM

**Electronics** Investigation 6, Part 4

Electronics CD-ROM: Workbench  
*This standard will also be addressed in the FOSS Middle School Module **Force and Motion**, still under development at the Lawrence Hall of Science.*

**Students will understand about science and technology**

Determine how science and technology are interrelated

Compare the intended benefits and unintended consequences of a technology

Explain constraints in technological designs (examples: properties of materials, size limitations)

**F. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE**

**Students will practice safety**

Demonstrate personal and group safety when engaged in science activities

Investigate the importance of monitoring quality standards related to soil, water, and air in the local community

Use protective gear in appropriate situations

**Students will know the relationships between populations, resources, and environments**

Compare environmental degradation on a global scale (examples: different countries, urban versus rural, developed versus undeveloped countries)

Explain the consequences of population growth (examples: environment, natural resources, quality of life)

Investigate international groups, organizations, and laws that focus on environmental degradation

**Students will analyze risks and benefits related to personal and group decisions**

Determine the advantages and disadvantages of various means of commercial energy

**Electronics**

Investigation 4, Parts 1-2

Investigation 9, Part 2

Electronics Resources pp. 18-21, 34-36

*This standard will also be addressed in the FOSS Middle School Module **Force and Motion**, still under development at the Lawrence Hall of Science.*

Safety is a top priority in FOSS. General safety guidelines are outlined in the Overview section of EACH FOSS teacher guide. Specific safety issues related to each lesson are listed in the lesson plan and denoted with a safety goggle icon in the margin. See for example:

**Earth History**

Investigation 5, Part 2

Weather and Water Resources pp. 45-47, 63-66

*This standard is addressed whenever potentially dangerous materials are used, and will be stressed in particular in **Chemistry**, a FOSS Middle School module still under development at the Lawrence Hall of Science.*

Weather and Water Resources pp. 45-47, 63-66

**Populations and Ecosystems**

Investigation 6, Parts 1-3

production

Analyze the costs and benefits associated with energy used in transportation (example: private automobiles versus public transportation)

Debate governmental roles and decisions related to environmental quality

## **G. HISTORY AND NATURE OF SCIENCE**

### **Students will examine science as a human endeavor**

Determine career paths and educational requirements for different science and technology careers

Identify prominent scientists from diverse ethnic and gender groups

### **Students will understand the nature of science**

Describe scientific discoveries that resulted from scientists working in cooperative groups

Investigate how scientists communicate their results and ideas

Describe situations in which scientists disagree about interpretations of evidence

### **Students will describe events in the history of science**

Create a timeline that identifies the roles of scientists who have contributed to the solution of a scientific problem

Provide historical examples of scientific and technological discoveries that have remained useful through modern time

FOSS [Science Stories](#) for Grades 5-6 and [Resources](#) books for FOSS Middle School and the "Careers" section of [fossweb.com](#) feature scientists throughout. Care is taken to show people of different backgrounds, males and females, using science and technology to answer questions and solve problems. See for example:

**Planetary Science Resources** pp. 52-53, 59-62, 67-68, 71-73

**Diversity of Life Resources** pp. 8-13

**Earth History Resources** pp. 75, 98-99

**Planetary Science Resources** pp. 52-53, 59-62, 67-68, 71-73

**Diversity of Life Resources** pp. 8-13

**Earth History Resources** pp. 75, 83-84, 98-99

This standard is addressed in Lab Notebooks used in EACH module for FOSS Middle School. It is also modeled in the video, readings, and Shoemaker debate in **Planetary Science**, cited in detail in the next standard.

**Planetary Science**, Investigation 5, Parts 1-4

**Planetary Science Resources** pp. 59-73

Planetary Science CD-ROM

**Planetary Science Resources** pp. 52-53, 99

**Earth History Resources** pp. 50-59, 83-87

**Populations and Ecosystems Resources** pp. 46-55, 58-63

**Planetary Science Resources** pp. 52-53, 99

**Human Brain and Senses Resources** p. 31

**Earth History Resources** pp. 50-59, 83-87

**Populations and Ecosystems Resources** pp. 46-55, 58-63

**Weather and Water Resources** pp. 20-21, 38

**DoDEA  
SCIENCE CONTENT STANDARDS**

**INTEGRATED SCIENCE III (Grade 8)**

Examples of investigations and readings meeting each of the benchmarks are listed from the nine FOSS Middle School Courses for grades 6-8. Of the courses, **Human Brain and Senses, Earth History, Planetary Science, Electronics, Diversity of Life, Weather and Water, and Populations and Ecosystems** are completed and included fully in the correlation. The other Middle School Courses, ***Force and Motion*** and ***Chemistry*** are in various stages of development and are included *in italics* where their correlation is anticipated.

*FOSS modules are inquiry-based and will easily meet the requirement of at least 30% of class time spent in laboratory exercises. The fundamentals of scientific inquiry are embedded in ALL FOSS modules.*

*Representative examples of activities meeting each standard are listed.*

<b>STANDARDS</b>	<b>FOSS</b>
<p><b>A. INQUIRY SKILLS</b></p> <p><b><u>Students will design and conduct scientific investigations</u></b></p> <p>Identify questions that can be answered through scientific investigations</p> <p>Use appropriate tools, technology, and techniques to gather, analyze, and interpret data</p> <p>Organize and maintain a journal showing all phases of investigations</p> <p>Develop descriptions, explanations, predictions, and models using evidence and logic</p> <p>Use mathematics to explain, interpret, and improve investigations and communications</p>	<p><b>Human Brain and Senses</b> Investigation 4, Pats 1-3</p> <p><b>Planetary Science</b> Investigation 8, Parts 1-4</p> <p><b>Electronics</b> Investigation 7, Parts 1-3 circuit boards and components</p> <p><b>Diversity of Life</b> Investigation 2, Parts 1-3 microscope</p> <p>ALL FOSS Middle School modules involve students recording and organizing data in Lab Notebooks. See for example:</p> <p><b>Planetary Science</b> Teacher Guide p.10 and Lab Notebook masters</p> <p><b>Human Brain and Senses</b> Teacher Guide pp. 3,12 and Lab Notebook masters</p> <p><b>Planetary Science</b> Investigation 3, Parts 1-4</p> <p><b>Populations and Ecosystems</b> Investigation 8, Parts 1-2</p> <p><b>Electronics</b> Investigation 3, Parts 1-4 voltage</p>

<p>Construct logical relationships between evidence and explanations</p> <p>Identify and analyze alternative explanations, models, and predictions</p> <p>Demonstrate understanding about scientific inquiry</p> <p>Use fair test procedures</p>	<p><b>Populations and Ecosystems</b> Investigation 6, Parts 1-3 population</p> <p><b>Human Brain and Senses</b> Investigation 7, Parts 1-3</p> <p><b>Electronics</b> Investigation 2, Parts 1-4</p> <p><b>Earth History</b> Investigation 1, Parts 1-2</p> <p><b>Planetary Science</b> Investigation 5, Parts 1-3</p> <p><b><u>Planetary Science Resources</u></b> pp. 59-73</p> <p>This standard can be addressed through Lab Notebook entries, teacher observation and formal Assessment. Many options are included in the Assessment section of the Teacher Guide. See for example: <b>Electronics</b> Investigation 6, Parts 1-4 Electronics CD-ROM (workbench)</p> <p><b>Planetary Science</b> Investigation 5, Parts 1-3</p> <p><b>Planetary Science</b> Investigation 5, Part 3</p> <p><b>Human Brain and Senses</b> Investigation 4, Parts 1-3</p>
<p><b><u>Students will communicate scientific procedures and explanations</u></b></p> <p>Demonstrate effective methods to organize and display scientific concepts</p> <p>Present investigative procedures and results to others verbally, graphically, and in writing</p> <p>Communicate science concepts accurately and clearly, using scientific vocabulary</p> <p><b>B. PHYSICAL SCIENCE</b></p> <p><b><u>Students will understand the principles of motion and forces</u></b></p> <p>Design and conduct investigations that demonstrate Newton’s Laws of Motion</p> <p>Analyze the position, direction, and speed of moving objects</p> <p>Calculate changes in potential and kinetic energy in everyday activities (examples:</p>	<p>This standard can be addressed through Lab Notebook entries and small group/classroom discussion and also through the end-of-module projects suggested for many modules. See for example: <b>Electronics</b> Investigation 2, Parts 1-4</p> <p><b>Earth History</b> Investigation 6, Parts 1-4</p> <p><b>Planetary Science</b> Investigation 10, Part 3</p> <p><b>Human Brain and Senses</b> Investigation 5, Parts 1-4</p> <p><i>This standard will also be addressed in the FOSS Middle School Module <b>Force and Motion</b>, still under development at the Lawrence Hall of Science.</i></p> <p><i>This standard will also be addressed in the</i></p>

<p>bouncing balls, movement of swings)</p> <p>Design and conduct investigations that measure forces and angles of colliding objects</p> <p><b><u>Students will investigate the transfer of energy</u></b></p> <p>Compare the basic characteristics of heat, light, electricity, and sound energy</p> <p>Compare and contrast energy transfer in heat, light, electricity and sound</p> <p>Design a device to demonstrate how the sun's energy can be used to perform a task</p> <p>Use a household appliance (examples: hair dryer, refrigerator) to explain how energy can be traced back to the sun</p> <p>Compare heat changes in different kinds of energy transfer.</p> <p>Construct electrical circuits that incorporate multiple energy transfers including light, heat, sound and mechanical devices</p> <p>Design and construct a simple electric motor and generator</p>	<p><i>FOSS Middle School Module <b>Force and Motion</b>, still under development at the Lawrence Hall of Science.</i></p> <p><b>Human Brain and Senses</b> (light) Investigation 3, Parts 1-3 Human Brain and Senses CD-ROM (optics bench) <b><u>Human Brain and Senses Resources</u></b> pp. 31-44 <b>Electronics</b> Investigation 4, Parts 1-2 Investigation 6, Parts 1-4 <b><u>Electronics Resources</u></b> pp. 1-4,9-15,18-21,23-25,34-36 <i>This standard will also be addressed in <b>Chemistry and Force and Motion</b>, FOSS Middle School modules still under development at the Lawrence Hall of Science.</i></p> <p><i>This standard is addressed in <b>Solar Energy</b>, designed for Grades 5-6.</i></p> <p><i>This standard is addressed in readings in <b>Solar Energy</b>, designed for Grades 5-6.</i></p> <p><i>This standard will be addressed in <b>Chemistry</b>, a FOSS Middle School module still under development at the Lawrence Hall of Science.</i></p> <p><i>This would be a simple extension to <b>Electronics</b>, which focuses primarily on light bulbs, diodes and light energy.</i></p> <p><i>This would be a natural extension to <b>Electronics</b>.</i></p>
<p><b>C. LIFE SCIENCE</b></p> <p><b><u>Students will relate structure to function in livings systems</u></b></p> <p>Explain the organizational levels of living systems (examples: ecosystem, organism, organ systems, organs, tissues, cells)</p> <p>Explain how the structure and function of one organizational level supports the next level</p>	<p><b>Diversity of Life</b> Investigation 4, Parts 1-2 an <b><u>Diversity of Life Resources</u></b> pp. 68-70 and CD-ROM "Ribbon of Life"</p> <p><b>Diversity of Life</b> Investigation 4, Parts 1-2 <b><u>Diversity of Life Resources</u></b> pp. 68-70, 76-78 and CD-ROM "Ribbon of Life"</p>

Explain the structures and functions of selected body systems (examples: digestive, excretory, digestive, and circulatory/immune)

Describe how systems in the human body interact with one another

Describe the nature of disease via system failure and infectious organisms.

**Students will analyze how human characteristics are transferred**

Describe the role of sex cells in carrying hereditary information

Explain how human characteristics are transferred from one generation to the next

Distinguish between the role of heredity and the role of environment on humans

**Students will study the diversity and adaptations of organisms**

Investigate how a population's diversity assists in adapting to the environment

Describe examples of how species diversity affects evolution

Explain how the extinction of a species is a result of the conditions associated with the environment

Investigate how the common ancestry of organisms is determined through the use of morphological and biochemical evidence

**D. EARTH AND SPACE SCIENCES**

**Students will explain the structures of the Earth system**

Relate plate tectonics to major geological events (examples: earthquakes, volcanic eruptions, and mountain building)

Examine evidences that explain the internal structures of the Earth

Diagram and explain how rocks form and

**Human Brain and Senses**

Investigation 2, Parts 1-3

Investigation 5, Parts 1-4

**Human Brain and Senses Resources**

Pp. 3-16, 29-30,36,45-46, 63-74

CD-ROM: Head: Brain and Senses

**Diversity of Life Resources** pp. 66-67

**Diversity of Life** Investigation 7 and

**Diversity of Life Resources** pp. 80-83

**Populations and Ecosystems**

**Resources** p. 61

**Populations and Ecosystems**

Investigation 9, Parts 1-4

**Populations and Ecosystems Resources**

pp. 46-55

Populations and Ecosystems CD-ROM

**Populations and Ecosystems**

Investigation 8, Parts 1-2

Investigation 10, Parts 1-3

**Populations and Ecosystems Resources**

Pp. 58-63

Populations and Ecosystems CD-ROM

**Earth History Resources** pp. 83-87

**Populations and Ecosystems**

**Resources** p. 61

**Populations and Ecosystems**

**Resources** pp. 58-63

**Earth History**

Investigation 4, Part 3

**Earth History Resources** pp. 100-105

CD-ROM: Earth Processes

**Earth History Resources** pp. 60-105

CD-ROM: Earth Processes

**Earth History Resources** pp. 60-82,93-

<p>change (the rock cycle)</p> <p>Explain the role of water in the sedimentation process</p> <p>Investigate and test soil samples to determine their physical and chemical properties</p> <p>Examine how organisms contribute to erosion and weathering of rocks and soils</p> <p><b><u>Students will understand the evolutionary nature of the Earth's history</u></b></p> <p>Investigate how fossils provide evidence of how life and environmental conditions have changed</p> <p>Describe conditions during the Earth's major geologic eras</p> <p>Provide evidence that the Earth's processes have been ongoing through geologic time (examples: erosion, plate movements, changes in atmospheric conditions)</p>	<p>97,100-105 CD-ROM: Earth Processes</p> <p><b>Earth History</b> Investigation 4, Parts 1-6 <b><u>Earth History Resources</u></b> pp. 23-26,60-63,64-82 Earth History CD-ROM</p> <p><b>Earth History</b> Investigation 7, Parts 1-2 <b><u>Earth History Resources</u></b> pp. 38-41,73-75,76-88 CD: Modern Environments</p> <p><b>Earth History</b> Investigation 6, Parts 1-4 <b><u>Earth History Resources</u></b> p. 37, 78-80 CD: Modern Environments</p> <p><b>Earth History ALL</b> Investigations 1-8 Resources pp. 73-80, 83-88, 100-105 CD: Geology Lab</p>
<p><b>E. SCIENCE AND TECHNOLOGY</b></p> <p><b><u>Students will demonstrate abilities in technological design</u></b></p> <p>Design and construct a solution to an identified problem</p> <p>Determine the effectiveness of the solution</p> <p>Design and conduct an investigation to determine the quality of commercial products (examples; orange juice, paper towels)</p> <p><b><u>Students will understand about science and technology</u></b></p> <p>Determine how science and technology are interrelated</p> <p>Compare the intended benefits and unintended consequences of a technology</p>	<p><b>Electronics</b> Investigation 6, Part 4 Investigation 9, Part 2 Electronics CD-ROM: Workbench <i>This standard will also be addressed in the FOSS Middle School Module <b>Force and Motion</b>, still under development at the Lawrence Hall of Science.</i></p> <p><b>Electronics</b> Investigation 4, Parts 1-2 Investigation 9, Part 2 <b><u>Electronics Resources</u></b> pp. 18-21, 34-36 <i>This standard will also be addressed in the FOSS Middle School Module <b>Force and</b></i></p>

<p>Explain constraints in technological designs (examples: properties of materials, size, weight)</p> <p><b>F. SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVE</b></p> <p><b><u>Students will practice safety</u></b></p> <p>Demonstrate personal and group safety when engaged in science activities</p> <p>Describe health problems related to sun exposure</p> <p>Analyze the use of personal safety devices</p> <p><b><u>Students will evaluate risks and benefits of natural or other hazards</u></b></p> <p>Identify and describe the risks associated with natural, biological, chemical and social hazards</p> <p>Describe personal actions required during natural hazards</p> <p>Discuss the benefits and risks associated with social decisions related to natural, biological, chemical, and social hazards</p> <p>Relate the principles of motion and forces to personal safety</p> <p><b>G. HISTORY AND NATURE OF SCIENCE</b></p> <p><b><u>Students will investigate examples of science as a human endeavor</u></b></p> <p>Provide examples of how scientific endeavor involves teamwork in various fields (examples: military, engineering, and the health professions)</p> <p>Investigate contributions from scientists representing different cultures and genders</p> <p>Identify human qualities associated with successful work in science</p> <p>Describe methods of communication that</p>	<p><b><i>Motion, still under development at the Lawrence Hall of Science.</i></b></p> <p>Safety is a top priority in FOSS. General safety guidelines are outlined in the Overview section of EACH FOSS teacher guide. Specific safety issues related to each lesson are listed in the lesson plan and denoted with a safety goggle icon in the margin. See for example:  <b>Earth History</b>  Investigation 5, Part 2</p> <p><b>Human Brain and Senses</b>  Investigation 1, Part 2  <b><u>Weather and Water Resources</u></b> pp. 45-47, 63-66</p> <p><b>Human Brain and Senses</b>  Investigation 1, Part 2  <i>This standard is addressed whenever potentially dangerous materials are used, and will be stressed in particular in <b>Chemistry</b>, a FOSS Middle School module still under development at the Lawrence Hall of Science.</i></p> <p><i>This standard will also be addressed in the FOSS Middle School Module <b>Force and Motion</b>, still under development at the Lawrence Hall of Science.</i></p> <p><u>Resources</u> books for ALL FOSS Middle School modules and the “Careers” section of fossweb.com feature scientists throughout. Care is taken to show people of different backgrounds, males and females, using science and technology to answer questions and solve problems. See for example:  <b><u>Planetary Science Resources</u></b> pp. 52-53, 59-62, 67-68, 71-73  <b><u>Diversity of Life Resources</u></b> pp. 8-13  <b><u>Earth History Resources</u></b> pp. 75, 98-99</p> <p>This standard is addressed in Lab Notebooks</p>
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<p>scientists use to share information</p> <p><b><u>Students will explain the nature of science</u></b></p> <p>Describe examples from current events where scientists disagree about scientific evidences, theories, and interpretations</p> <p>Compare and analyze experimental procedures in contemporary science investigations</p> <p><b><u>Students will understand important historical events of science</u></b></p> <p>Describe the efforts of scientists who have contributed significantly to scientific knowledge</p> <p>Explain how scientific theory and explanations have been influenced by historic cultures (examples: Egyptians, Mayans, Arabs)</p>	<p>used in EACH module for FOSS Middle School. It is also modeled in the video, readings, and Shoemaker debate in <b>Planetary Science</b>, cited in detail in the next standard.</p> <p><b>Planetary Science</b>, Investigation 5, Parts 1-4 <b><u>Planetary Science Resources</u></b> pp. 59-73 Planetary Science CD-ROM</p> <p><b>Planetary Science</b>, Investigation 5, Parts 1-4 <b><u>Planetary Science Resources</u></b> pp. 59-73 Planetary Science CD-ROM</p> <p><b>Earth History</b> Investigation 5, Parts 1-4 <b><u>Earth History Resources</u></b> pp. 75, 98-99 Earth History CD-ROM</p> <p><b><u>Populations and Ecosystems Resources</u></b> pp. 62-63</p> <p><b>Electronics</b> Investigation 4, Part 1 <b><u>Electronics Resources</u></b> pp. 1-2,18-21,23-25 <b><u>Planetary Science Resources</u></b> pp. 52-53,99 <b><u>Earth History Resources</u></b> pp. 50-59, 83-87 <b><u>Populations and Ecosystems Resources</u></b> pp. 46-55,58-63</p> <p><b><u>Planetary Science Resources</u></b> pp. 52-53,99 <b><u>Human Brain and Senses Resources</u></b> p. 31 <b><u>Earth History Resources</u></b> pp. 50-59, 83-87 <b><u>Populations and Ecosystems Resources</u></b> pp. 46-55,58-63 <b><u>Weather and Water Resources</u></b> pp. 20-21,38</p>
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