



**FOSS** Full Option Science System

(FOSS™)

Grades K-8

Correlation to

**Missouri  
Science  
Grade Level Expectations**



# **Missouri Science Grade Level Expectations**

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

**The following correlation of the Missouri Science Grade Level Expectations to the Full Option Science System (FOSS) Program is to show representative examples of investigations and activities that address listed standards and the grade level expectations. A citation does not reflect all of the investigations or activities that might address a particular standard or grade level expectation.**

*July, 2007*  
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*Updated November 2008*

# GRADE K

## STRAND 1

### Properties and Principles of Matter and Energy

#### 1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Properties of Matter</i>  |   |   |
| a. Describe physical properties of objects (i.e., size, shape, color, mass) by using the senses, simple tools (e.g., magnifiers, equal arm balances), and/or nonstandard measures (e.g., bigger/smaller; more/less) | <b>Wood and Paper</b><br>Investigation 1, Part 1<br>Investigation 3, Part 1<br><b>Fabric</b><br>Investigation 1, Parts 1-2, 4<br><b>Trees</b><br>Investigation 2, Part 2<br>Investigation 3, Part 5                     | Pages 8-14<br>Pages 8-12<br><br>Pages 6-15, 20-22<br><br>Pages 10-15<br>Pages 22-25 |
| b. Identify materials (e.g., cloth, paper, wood, rock, metal) that make up an object and some of the physical properties of the materials (e.g., color, texture, shiny/dull, odor, sound, taste, flexibility)       | <b>Wood and Paper</b><br>Investigation 1, Parts 2-3<br>Investigation 2, Parts 1-2<br>Investigation 3, Part 4<br><b>Fabric</b><br>Investigation 1, Parts 3-4<br>Investigation 2, Part 1                                  | Pages 15-23<br>Pages 8-15<br>Pages 22-25<br><br>Pages 16-22<br>Pages 7-11           |
| c. Sort objects based on observable physical properties (e.g., size, material, color, shape, mass)  | <b>Trees</b><br>Investigation 2, Parts 2-3<br>Investigation 2, Science Extension<br><b>Wood and Paper</b><br>Investigation 3, Part 4<br><b>Animals Two by Two</b><br>Investigation 1, Part 4<br>Investigation 2, Part 3 | Pages 10-19<br><br>Page 29<br><br>Pages 22-25<br><br>Pages 26-29<br>Pages 18-21     |

#### 2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

| Grade Level Expectation  | FOSS   | Page(s) |
|--|--|---------|
| <i>Scope and Sequence – Investigating Sound</i>  |  |         |
| a. Identify the sounds and their source of vibrations in everyday life (e.g., alarms, car horns, animals, machines, musical instruments) | This topic is addressed in the Science Stories of the grade one module <u>Balance and Motion</u> . |         |
| b. Compare different sounds (i.e., loudness, pitch, rhythm)  | This topic is addressed in the Science Stories of the grade one module <u>Balance and Motion</u> . |         |

|   |  |  |
|---|--|--|
| c. Recognize that the ear serves as a receiver of sound | This topic is addressed in the Science Stories of the grade one module <u>Balance and Motion</u> . |  |
|---|--|--|

## STRAND 2

### Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

**Concept A:** The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence – Changes in Position</i>   |  |  |
| a. Describe an object's position relative to another object (e.g., above, below, in front of, behind) | <b>Wood and Paper</b><br>Investigation 1, Parts 4-5<br>Investigation 2, Part 4<br>Investigation 3, Parts 2-4<br><b>Fabric</b><br>Investigation 1, Part 4<br>Investigation 2, Part 1<br>Science Stories<br><b>Trees</b><br>Investigation 1, Parts 5-6 | Pages 24-32<br>Pages 20-23<br>Pages 13-25<br><br>Pages 20-22<br>Pages 7-11<br>Pages 14-17<br><br>Pages 25-30 |

2. Forces affect motion

**Concept A:** Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude

| Grade Level Expectation  | FOSS   | Page(s)                        |
|--|--|--------------------------------|
| <i>Scope and Sequence – Changes in Position</i>                              |  |                                |
| a. Identify ways (push, pull) to cause some objects to move by touching them | <b>Wood and Paper</b><br>Investigation 1, Parts 4-5<br><b>Fabric</b><br>Investigation 1, Parts 4-6 | Pages 24-32<br><br>Pages 20-23 |
| b. Recognize magnets cause some objects to move without touching them        | <b>Fabric</b><br>Investigation 1, Science Extension  | Page 36                        |

## STRAND 3

### Characteristics and Interactions of Living Organisms

1. There is a fundamental unity underlying the diversity of all living organisms

**Concept D:** Plants and animals have different structures that serve similar functions necessary for the survival of the organism

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Plants and Animals</i>   |   |   |
| a. Observe and compare the structures and behaviors of different kinds of plants and animals | <b>Trees</b><br>Investigation 1, Part 1<br>Investigation 2, Parts 2-3<br>Investigation 3, Parts 5-6<br><b>Animals Two by Two</b><br>Investigation 1, Part 1<br>Investigation 2, Parts 1, 3-4<br>Investigation 3, Parts 1, 3 | Pages 7-14<br>Pages 10-19<br>Pages 22-28<br><br>Pages 10-16<br>Pages 9-13, 18-24<br>Pages 8-12, 17-20 |

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|--|--|------------|
|  | Science Stories<br>FOSS Web, Photo Gallery | Pages 4-23 |
|--|--|------------|

**3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes**

**Concept D: There is heritable variation within every species of organism**

| Grade Level Expectation  | FOSS   | Page(s)     |
|--|--|-------------|
| <i>Scope and Sequence – Parent – Offspring Relationships</i>   |  |             |
| a. Recognize that living things have offspring   | <b>Animals Two by Two</b><br>Investigation 5, Parts 1-2<br>FOSS Web, Activity: Find the Parent | Pages 10-19 |
| b. Recognize a parent – offspring relationship based on the organisms' physical similarities and differences | <b>Animals Two by Two</b><br>Investigation 5, Parts 2-4<br>FOSS Web, Activity: Find the Parent | Pages 16-27 |

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

**1. Organisms are interdependent with one another and with their environment**

**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

| Grade Level Expectation   | FOSS   | Page(s)                                 |
|---|--|---|
| <i>Scope and Sequence – Weather and Seasons</i>   |  |   |
| a. Describe how the seasons affect the behavior of plants and animals.                      | <b>Trees</b><br>Investigation 2, Part 1<br>Investigation 3, Parts 1-9<br>Science Stories | Pages 6-9<br>Pages 10-38<br>Pages 14-23 |
| b. Describe how the seasons affect the everyday life of humans (e.g., clothing, activities) | This topic is addressed in the grade one module <u>Air and Weather</u> .                 |   |

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

**1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept C: The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles**

| Grade Level Expectation                         | FOSS  | Page(s)     |
|---|---|-------------|
| <i>Scope and Sequence – Weather and Seasons</i> |   |             |
| a. Recognize moving air is felt as wind         | <b>Trees</b><br>Tools for Observing Weather:<br>Tool, 5-6 | Pages 18-24 |

1. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

**Concept F:** Constantly changing properties of the atmosphere occur in patterns which are described as weather

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|-----------|
| <p><i>Scope and Sequence – Weather and Seasons</i></p> <p>a. Observe and describe daily weather: precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind), cloud cover, temperature</p> <p>b. Observe and describe the general weather conditions that occur during each season</p> | <p><b>Trees</b><br/>Tools for Observing Weather: Tool, 1</p> <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> | Pages 6-9 |

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

1. The universe has observable properties and structure

**Concept A:** The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies

| Grade Level Expectation   | FOSS   | Page(s) |
|---|--|---------|
| <p><i>Scope and Sequence – Objects in the Sky</i></p> <p>a. Observe and describe the presence of the Sun, moon, and stars in the sky</p> <p>b. Recognize there are more stars in the sky than anyone can easily count, but they are not scattered evenly and vary in brightness</p> | <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> |         |

2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces

**Concept A:** The apparent position of the Sun and other stars, as seen from Earth, changes in observable patterns

| Grade Level Expectation   | FOSS  | Page(s) |
|---|---|---------|
| <p><i>Scope and Sequence – Objects in the Sky</i></p> <p>a. Describe the Sun as only being seen in the daytime</p> <p>b. Recognize the Sun appears to move across the sky from morning to night</p> | <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> |         |

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

| Grade Level Expectation  | FOSS  | Page(s) |
|--|---|---------|
| <p><i>Scope and Sequence – Objects in the Sky</i></p> <p>a. Observe the moon can be seen sometimes at night and sometimes during the daytime</p> <p>b. Recognize the moon appears to change shape over the course of a month</p> | <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> |         |

**Concept C: The regular and predictable motions of the Earth and moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

| Grade Level Expectation   | FOSS   | Page(s) |
|---|--|---------|
| <p><i>Scope and Sequence – Weather and Seasons</i></p> <p>a. Observe and describe the characteristics of the four seasons as they cycle through the year (summer, fall, winter, spring)</p> | <p>This topic is addressed in the grade one module <u>Air and Weather</u>.</p> |         |

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Pose questions about objects, materials, organisms and events in the environment</p> <p>b. Conduct a simple investigation (fair test) to answer a question</p> | <p>FOSS modules emphasize an inquiry approach. Students ask questions and seek answers. See for example:</p> <p><b>Fabric</b><br/>Investigation 2, Parts 1-3</p> <p><b>Wood and Paper</b><br/>Investigation 1, Parts 3-4<br/>Investigation 3, Part 4</p> <p><b>Animals Two by Two</b><br/>Investigation 3, Part 3</p> <p><b>Trees</b><br/>Investigation 2, Parts 2-3</p> <p><b>Fabric</b><br/>Investigation 2, Parts 1-3</p> <p><b>Wood and Paper</b><br/>Investigation 1, Parts 3-4<br/>Investigation 3, Part 4</p> <p><b>Animals Two by Two</b><br/>Investigation 1, Part 3<br/>Investigation 3, Part 3</p> | <p>Pages 7-21</p> <p>Pages 20-27<br/>Pages 22-25</p> <p>Pages 17-20</p> <p>Pages 10-19</p> <p>Pages 7-21</p> <p>Pages 20-27<br/>Pages 22-25</p> <p>Pages 22-25<br/>Pages 17-20</p> |

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|--|--|-------------|
|  | <b>Trees</b><br>Investigation 2, Parts 2-3 | Pages 10-19 |
|--|--|-------------|

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence - All Units</i>   |   |   |
| a. Make qualitative observations using the five senses  | FOSS investigations emphasize student observation. See for example:<br><b>Fabric</b><br>Investigation 1, Parts 1-2<br><b>Wood and Paper</b><br>Investigation 1, Parts 1-2<br>Investigation 3, Part 1<br><b>Animals Two by Two</b><br>Investigation 1, Part 1, 3-4<br><b>Trees</b><br>Investigation 1, Part 1<br>Investigation 2, Parts 1-2<br>Investigation 3, Part 5 | Pages 6-15<br><br>Pages 8-19<br>Pages 8-12<br><br>Pages 10-16, 22-29<br><br>Pages 7-14<br>Pages 6-15<br>Pages 22-25 |
| b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers) | <b>Fabric</b><br>Investigation 1, Part 4<br><b>Trees</b><br>Investigation 1, Part 7<br>Investigation 3, Part 9  | Pages 20-22<br><br>Pages 31-34<br>Pages 35-38   |
| c. Measure length and mass using non-standard units   | <b>Trees</b><br>Investigation 1, Part 7<br>Investigation 3, Part 9  | Pages 31-34<br>Pages 35-38  |
| d. Compare amounts/measurements   | <b>Wood and Paper</b><br>Investigation 1, Part 5<br><b>Animals Two by Two</b><br>Investigation 3, Part 3<br><b>Trees</b><br>Investigation 1, Part 7<br>Investigation 3, Part 9  | Pages 28-32<br><br>Pages 17-20<br><br>Pages 31-34<br>Pages 35-38  |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation                                    | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence - All Units</i>                      |  |  |
| a. Use observations as support for reasonable explanations | FOSS investigations emphasize the use of evidence to formulate explanations. See for example:<br><b>Wood and Paper</b><br>Investigation 3, Part 4<br><b>Fabric</b><br>Investigation 2, Part 2<br><b>Animals Two by Two</b><br>Investigation 1, Part 3<br><b>Trees</b><br>Investigation 2, Part 3 | Pages 22-25<br><br>Pages 12-17<br><br>Pages 22-25<br><br>Pages 16-19 |
| b. Use observations to describe relationships and          | <b>Wood and Paper</b><br>Investigation 3, Part 4   | Pages 22-25  |

|   |   |   |
|---|---|---|
| patterns and to make predictions to be tested | <b>Fabric</b><br>Investigation 2, Part 2<br><b>Animals Two by Two</b><br>Investigation 1, Part 3<br><b>Trees</b><br>Investigation 2, Part 3 | Pages 12-17<br><br>Pages 14-24<br><br>Pages 16-19 |
|---|---|---|

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i><br>a. Compare explanations with prior knowledge | FOSS investigations encourage evaluation of explanations. See for example:<br><b>Wood and Paper</b><br>Investigation 1, Parts 3-4<br>Investigation 3, Part 4<br><b>Fabric</b><br>Investigation 2, Parts 1-2<br><b>Animals Two by Two</b><br>Investigation 1, Part 2<br><b>Trees</b><br>Investigation 1, Part 1<br>Investigation 3, Part 7 | <br><br><br>Pages 20-27<br>Pages 22-25<br><br>Pages 7-17<br><br>Pages 17-21<br><br>Pages 7-14<br>Pages 29-31 |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence - All Units</i><br>a. Communicate observations using words, pictures, and numbers | FOSS investigations emphasize student communication. See for example:<br><b>Wood and Paper</b><br>Investigation 1, Parts 4-5<br><b>Fabric</b><br>Investigation 2, Parts 3-4<br><b>Animals Two by Two</b><br>Investigation 1, Part 1, 3-4<br><b>Trees</b><br>Investigation 2, Part 3<br>Investigation 2, Math Extension | <br><br><br>Pages 24-32<br><br>Pages 18-25<br><br>Pages 10-16, 22-29<br><br>Pages 16-19<br><br>Page 29 |

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| Grade Level Expectation   | FOSS   | Page(s)          |
|---|--|------------------|
| <i>Scope and Sequence – Properties of Matter/Weather and Seasons</i><br>a. Recognize some objects occur in nature (natural objects); others have been | <b>Wood and Paper</b><br>Science Stories<br>FOSS Web, Activity: Where is | Pages 3-8, 13-18 |

|                             |   |  |
|-----------------------------|---|--|
| designed and made by people | Wood<br><b>Fabric</b><br>Science Stories<br><b>Animals Two by Two</b><br>Science Stories<br>FOSS Web, Photo Gallery<br><b>Trees</b><br>Science Stories<br>FOSS Web, Photo Gallery | Pages 3-15<br><br>Pages 3-24<br><br>Pages 3-12 |
|-----------------------------|---|--|

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation   | FOSS   | Page(s)                                       |
|---|--|---|
| <i>Scope and Sequence – Properties of Matter/Plants and Animals</i><br>a. Describe how tools have helped scientists make better observations (i.e., magnifiers) | <b>Fabric</b><br>Investigation 1, Part 4<br><b>Trees</b><br>Investigation 1, Part 7<br>Investigation 3, Part 9 | Pages 20-22<br><br>Pages 31-34<br>Pages 35-38 |

**1. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence - All Units</i><br>a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)<br><br>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally) | FOSS investigations provide opportunity to identify questions/problems and to solve them. See for example:<br><b>Wood and Paper</b><br>Investigation 1, Parts 3-5<br><b>Fabric</b><br>Investigation 2, Part 1<br><br><b>Wood and Paper</b><br>Investigation 1, Parts 3-5<br><b>Fabric</b><br>Investigation 2, Part 1 | Pages 20-32<br><br>Pages 7-21<br><br>Pages 20-32<br>Pages 7-21 |

# GRADE ONE

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A:** Objects, and the materials they are made of, have properties that can be used to describe and classify them

| Grade Level Expectation  | FOSS   | Page(s) |
|--|--|---------|
| <i>Scope and Sequence – Properties of Matter: Mass and Temperature</i>                                   |  |         |
| a. Given an equal-arm balance and various objects, illustrate arrangements in which the beam is balanced | <b>Solids and Liquids</b><br>Investigation 3, Math Extension | Page 30 |
| b. Measure and compare the mass of objects (more/less)   | <b>Solids and Liquids</b><br>Investigation 3, Math Extension | Page 30 |
| c. Order objects according to mass   |  |         |

2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A:** Forms of energy have a source, a means of transfer (work and heat), and a receiver

| Grade Level Expectation  | FOSS   | Page(s)                                |
|--|--|--|
| <i>Scope and Sequence – Properties of Matter: Mass and Temperature</i>   |  |  |
| a. Identify the source of energy that causes an increase in the temperature of an object (e.g., Sun, stove, flame, light bulb) | <b>Air and Weather</b><br>Investigation 2, Part 2<br>Science Stories<br><b>Solids and Liquids</b><br>Science Stories | Pages 14-19<br>Page 21<br>Pages 14, 17 |
| b. Compare the temperature of hot and cold objects using a simple thermometer  | <b>Air and Weather</b><br>Investigation 2, Part 2  | Pages 14-19                            |
| c. Describe the change in temperature of an object as warmer or cooler   | <b>Air and Weather</b><br>Investigation 2, Part 2<br>Investigation 2, Science Extension                              | Pages 14-19<br>Page 31                 |

**Concept C:** Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth

| Grade Level Expectation   | FOSS   | Page(s)                          |
|---|--|----------------------------------|
| <i>Scope and Sequence – Characteristics of Plants and Animals</i>   |  |                                  |
| a. Identify light from the Sun as a basic need of most plant Identify light from the Sun as a basic need of | <b>New Plants</b><br>Investigation 1, Part 2<br>Investigation 2, Science Extension | Pages 13-22<br>Page 30<br>Page 6 |

|             |  |                         |
|-------------|--|-------------------------|
| most plants | Science Stories<br><b>Plants and Animals</b><br>Investigation 1, Science Extension<br><b>Insects and Plants</b><br>Investigation 2, Part 2 | Page 76<br>Pages 95-104 |
|-------------|--|-------------------------|

## STRAND 2

### Properties and Principles of Force and Motion

**1. The motion of an object is described by its change in position relative to another object or point**

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Investigating Motion</i>   |   |   |
| a. Compare the position of an object relative to another object (e.g., left of or right of)                                | <b>Balance and Motion</b><br>Investigation 1, Parts 1-4<br><b>Air and Weather</b><br>Investigation 1, Part 4<br>Investigation 4, Part 3   | Pages 8-28<br>Pages 21-26<br>Pages 19-21                              |
| b. Describe an object's motion as straight, circular, vibrational (back and forth), zigzag, stopping, starting, or falling | <b>Balance and Motion</b><br>Investigation 2, Parts 1-3<br>Investigation 3, Parts 1-3<br>Science Stories<br><b>Air and Weather</b><br>Investigation 1, Part 6<br>Investigation 3, Parts 3-4 | Pages 8-25<br>Pages 6-25<br>Pages 14-23<br>Pages 34-38<br>Pages 17-27 |
| c. Compare the speeds (faster vs. slower) of two moving objects  | <b>Balance and Motion</b><br>Science Stories  | Pages 28-29   |

**2. Forces affect motion**

**Concept A: Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude)**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Investigating Motion</i>                                |   |   |
| a. Identify the force (i.e., push or pull) required to do work (move an object) | <b>Balance and Motion</b><br>Investigation 2, Parts 1-2<br>Science Stories<br><b>Air and Weather</b><br>Investigation 1, Parts 4-6<br>Investigation 3, Part 3 | Pages 8-19<br>Pages 10-13<br>Pages 21-25<br>Pages 17-21 |

**Concept D: Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

| Grade Level Expectation   | FOSS  | Page(s)                                 |
|---|---|---|
| <i>Scope and Sequence – Investigating Motion</i>  |   |   |
| a. Describe ways to change the motion of an object (i.e., how to cause an object to go slower, go faster, go farther, change direction, stop) | <b>Balance and Motion</b><br>Investigation 2, Parts 1-3<br>Investigation 3, Parts 1-2<br>Science Stories<br>FOSS Web, Activity: Roller Coasters<br><b>Air and Weather</b> | Pages 8-25<br>Pages 6-18<br>Pages 28-29 |

|  |   |                            |
|--|---|----------------------------|
|  | Investigation 1, Parts 3-6<br>Investigation 3, Part 3 | Pages 17-38<br>Pages 17-21 |
|--|---|----------------------------|

### STRAND 3

#### Characteristics and Interactions of Living Organisms

#### 1. There is a fundamental unity underlying the diversity of all living organisms

##### **Concept A: Organisms have basic needs for survival**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Characteristics of Plants and Animals</i>  |   |   |
| a. Identify the basic needs of most animals (i.e., air, water, food, shelter)  | <b>Insects</b><br>Investigation 1, Part 1<br>Investigation 2, Part 1<br>Investigation 3, Part 2<br>Investigation 4, Part 2<br><b>Plants and Animals</b><br>Investigation 3, Part 2<br>Science Resources<br><b>Insects and Plants</b><br>Investigation 1, Part 1<br>Investigation 4, Part 2<br>Investigation 5, Part 1 | Pages 8-15<br>Pages 8-13<br>Pages 12-20<br>Pages 14-18<br><br>Pages 128-134<br>Pages 21-23<br><br>Pages 52-61<br>Pages 170-174<br>Pages 206-211 |
| b. Identify the basic needs of most plants (i.e., air, water, light)   | <b>New Plants</b><br>Investigation 1, Part 2<br>Investigation 2, Part 1<br>Science Stories<br><b>Plants and Animals</b><br>Investigation 1, Part 1<br>Investigation 3, Part 1<br>Science Resources<br><b>Insects and Plants</b><br>Investigation 2, Part 1  | Pages 13-22<br>Pages 8-14<br>Pages 3-7<br><br>Pages 47-57<br>Pages 120-127<br>Pages 3-7<br><br>Pages 91-94                                      |
| c. Predict and investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water) | <b>New Plants</b><br>Investigation 2, Part 2<br>Investigation 2, Science Extension<br><b>Pebbles, Sand, and Silt</b><br>Science Stories<br><b>Plants and Animals</b><br>Investigation 1, Science Extension  | Pages 15-19<br><br>Page 30<br><br>Pages 24-25<br><br>Page 76  |

##### **Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence – Characteristics of Plants and Animals</i>  |  |  |
| a. Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots) | <b>New Plants</b><br>Investigation 1, Part 3<br>Investigation 2, Part 1<br>Science Stories<br>FOSS Web, Activity: Watch it Grow<br><b>Plants and Animals</b><br>Investigation 1, Parts 1-3 | Pages 23-30<br>Pages 8-14<br>Pages 8-15<br><br>Pages 47-72 |

|  |   |   |
|--|---|---|
| <p>b. Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering) (Do NOT assess terms: sensory organs, appendages)</p> <p>c. Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, reproduction)</p> <p>d. Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)</p> | <p>Investigation 2, Parts 1-3<br/>Investigation 4, Parts 1-2<br/>Science Resources<br/><b>Insects and Plants</b><br/>Investigation 2, Part 3<br/>Science Resources</p> <p><b>Insects</b><br/>Investigations 1-6<br/>Science Stories<br/>FOSS Web, Photo Gallery:<br/>Interesting Insects<br/><b>Plants and Animals</b><br/>Investigation 2, Parts 2-3<br/>Science Resources</p> <p><b>Insects and Plants</b><br/>Investigation 1, 3-5, all parts<br/>Science Resources</p> <p><b>New Plants</b><br/>Investigation 1, Part 3<br/>Science Stories<br/>FOSS Web, Activity: Watch it Grow<br/><b>Plants and Animals</b><br/>Investigation 1, Parts 1-3<br/>Investigation 2, Parts 1-3<br/>Investigation 4, Parts 1-2<br/>Science Resources<br/><b>Insects and Plants</b><br/>Investigation 2, Part 3<br/>Science Resources</p> <p><b>Insects</b><br/>Investigations 1-6<br/>Science Stories<br/>FOSS Web, Photo Gallery:<br/>Interesting Insects<br/><b>Plants and Animals</b><br/>Investigation 3, Parts 2-3<br/>Science Resources</p> <p><b>Insects and Plants</b><br/>Investigation 1,3-5, all parts<br/>Science Resources</p> | <p>Pages 87-108<br/>Pages 151-163<br/>Pages 4-7, 16-19</p> <p>Pages 105-115<br/>Pages 15-19</p> <p>Pages 3-15</p> <p>Pages 128-140<br/>Pages 30, 33, 35, 39, 41-42, 44, 47-50</p> <p>Pages 30-33</p> <p>Pages 23-30<br/>Pages 6-15</p> <p>Pages 47-72<br/>Pages 87-108<br/>Pages 151-163<br/>Pages 4-7, 16-19</p> <p>Pages 105-115<br/>Pages 15-19</p> <p>Pages 8-13</p> <p>Pages 128-140<br/>Pages 30, 33, 35, 39, 41-42, 44, 47-50</p> <p>Pages 30-33</p> |
|--|---|---|

**Concept E: Biological classifications are based on how organisms are related**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <p><i>Scope and Sequence – Characteristics of Plants and Animals</i></p> <p>a. Distinguish between plants and animals based on observable structures and behaviors)</p> | <p><b>Insects</b><br/>Investigations 1-6<br/>Science Stories<br/>FOSS Web, Photo Gallery:<br/>Interesting Insects<br/><b>New Plants</b><br/>Investigation 1, Part 3<br/>Science Stories<br/>FOSS Web, Activity: Watch it</p> | <p>Pages 3-15</p> <p>Pages 13-22<br/>Pages 3-15</p> |

|  |  |                              |
|--|--|------------------------------|
|  | Grow<br><b>Plants and Animals</b><br>Investigation 1-4, all parts<br>Science Resources<br><b>Insects and Plants</b><br>Investigation 1-5, all parts<br>Science Resources | Pages 3-50<br><br>Pages 3-55 |
|--|--|------------------------------|

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

- 1. Organisms are interdependent with one another and with their environment**  
**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence –<br/>Characteristics of Plants and<br/>Animals</i>          |   |   |
| a. Identify ways man depends on plants and animals for food, clothing, and shelter | <b>New Plants</b><br>Science Stories<br><b>Insects</b><br>Science Stories<br><b>Plants and Animals</b><br>Science Resources<br><b>Insects and Plants</b><br>Science Resources | Pages 16-21<br><br>Page 7<br><br>Pages 9-14<br><br>Page 7 |

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

- 2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**  
**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

| Grade Level Expectation   | FOSS  | Page(s)                           |
|---|---|-----------------------------------|
| <i>Scope and Sequence –<br/>Observing Water and Weather</i>   |   |                                   |
| a. Observe, measure, record weather data throughout the year (i.e., cloud cover, temperature, precipitation, wind speed) by using thermometers, rain gauges, wind socks | <b>Air and Weather</b><br>Investigation 2, Parts 2-4<br>Investigation 3, Parts 2, 4 | Pages 14-37<br>Pages 12-16, 22-27 |
| b. Compare temperatures in different locations (e.g., inside, outside, in the sun, in the shade)  | <b>Air and Weather</b><br>Investigation 2, Part 2                                   | Pages 14-19                       |
| c. Compare weather data observed at different times throughout the year (e.g., hot vs. cold, cloudy vs. clear, types of precipitation, windy vs.                        | <b>Air and Weather</b><br>Investigation 2, Parts 1-4<br>Investigation 4, Parts 1-2  | Pages 8-27<br>Pages 8-18          |

|  |  |            |
|--|--|------------|
| calm)  |  |            |
| d. Recognize patterns indicating relationships between observed weather data and weather phenomena (e.g., temperature and types of precipitation, clouds and amounts of precipitation) | <b>Air and Weather</b><br>Investigation 4, Parts 1-2 | Pages 8-18 |

**3. Human activity is dependent upon and affects Earth's resources and systems**  
**Concept A: Earth's materials are limited natural resources affected by human activity**

| Grade Level Expectation  | FOSS  | Page(s)                                 |
|--|---|---|
| <i>Scope and Sequence – Observing Water and Weather</i>  |   |   |
| a. Observe and describe ways water, both as a solid and liquid, is used in every day activities at different times of the year (e.g., bathe, drink, make ice cubes, build snowmen, cook, swim) | <b>Solids and Liquids</b><br>Science Stories<br><b>Air and Weather</b><br>Science Stories | Pages 2, 4-5, 7, 16<br><br>Pages 19, 21 |

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence - All Units</i>  |   |  |
| a. Pose questions about objects, materials, organisms, and events in the environment | FOSS modules emphasize an inquiry approach. Students ask questions and seek answers. See for example:<br><b>Solids and Liquids</b><br>Investigation 1, Part 2<br><b>Pebbles, Sand and Silt</b><br>Investigation 2, Parts 1-4<br>Investigation 4, Parts 1-3<br><b>New Plants</b><br>Investigation 2, Part 2<br><b>Plants and Animals</b><br>Investigation 1, Part 2<br><b>Insects and Plants</b><br>Investigation 3, Parts 1-3 | Pages 17-20<br><br>Pages 8-29<br>Pages 8-25<br><br>Pages 15-19<br><br>Pages 58-62<br><br>Pages 120-140 |
| b. Plan and conduct a simple investigation (fair test) to                            | <b>Solids and Liquids</b><br>Investigation 1, Part 3  | Pages 21-24  |

|                   |   |  |
|-------------------|---|--|
| answer a question | Investigation 4, Parts 1-2<br><b>New Plants</b><br>Investigation 2, Part 2<br><b>Balance and Motion</b><br>Investigation 3, Parts 1-3<br><b>Plants and Animals</b><br>Investigation 1, Part 2 | Pages 7-22<br><br>Pages 15-19<br><br>Pages 6-25<br><br>Pages 58-62 |
|-------------------|---|--|

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence - All Units</i>   |  |  |
| a. Make qualitative observations using the five senses  | FOSS investigations emphasize student observation. See for example:<br><b>Solids and Liquids</b><br>Investigation 1, Parts 1-2<br>Investigation 2, Parts 1-3<br><b>Pebbles, Sand and Silt</b><br>Investigation 4, Parts 1, 3<br><b>Air and Weather</b><br>Investigation 1, Parts 1-4<br><b>Plants and Animals</b><br>Investigation 3, Parts 1-2<br><b>Insects and Plants</b><br>Investigation 5, Parts 1-3 | Pages 8-20<br>Pages 10-27<br><br>Pages 8-14, 19-25<br><br>Pages 8-26<br><br>Pages 120-134<br><br>Pages 206-225 |
| b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers) | <b>Insects</b><br>Investigation 1, Parts 1-3<br>Investigation 2, Parts 1-2<br><b>Air and Weather</b><br>Investigation 2, Parts 2, 4<br><b>Pebbles, Sand and Silt</b><br>Investigation 1, Parts 1-3<br><b>Insects and Plants</b><br>Investigation 3, Parts 1-3  | Pages 8-24<br>Pages 8-19<br><br>Pages 14-19, 24-27<br><br>Pages 8-21<br><br>Pages 52-75                        |
| c. Measure length, mass, and temperature using standard and non-standard units  | <b>Air and Weather</b><br>Investigation 2, Parts 2, 4<br><b>New Plants</b><br>Investigation 2, Part 3<br><b>Balance and Motion</b><br>Investigation 1, Math Extension<br><b>Plants and Animals</b><br>Investigation 1, Part 3<br><b>Insects and Plants</b><br>Investigation 2, Part 3  | Pages 14-19, 24-27<br><br>Pages 20-28<br><br>Page 30<br><br>Pages 63-72<br><br>Pages 105-115                   |
| d. Compare amounts/measurements   | <b>Solids and Liquids</b><br>Investigation 2, Part 3<br><b>Air and Weather</b><br>Investigation 2, Part 4<br><b>Pebbles, Sand and Silt</b><br>Investigation 2, Parts 1-3<br>Investigation 4, Part 1  | Pages 21-27<br><br>Pages 24-27<br><br>Pages 8-23<br>Pages 8-14   |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation               | FOSS | Page(s) |
|---------------------------------------|------|---------|
| <i>Scope and Sequence - All Units</i> |      |         |

|  |   |   |
|--|---|---|
| <p>a. Use observations as support for reasonable explanations</p>                                      | <p>FOSS investigations emphasize the use of evidence to formulate explanations. See for example:<br/> <b>Balance and Motion</b><br/> Investigation 1, Parts 2-3<br/> Investigation 3, Parts 1-2<br/> <b>Solids and Liquids</b><br/> investigation 2, Part 3<br/> Investigation 4, Parts 1-2<br/> <b>Pebbles, Sand and Silt</b><br/> Investigation 2, Part 3<br/> <b>Plants and Animals</b><br/> Investigation 1, Part 2</p> | <p>Pages 14-23<br/> Pages 6-18<br/> Pages 21-27<br/> Pages 7-22<br/> Pages 18-23<br/> Pages 62-70</p> |
| <p>b. Use observations to describe relationships and patterns and to make predictions to be tested</p> | <p><b>Balance and Motion</b><br/> Investigation 3, Parts 2-3<br/> <b>Insects</b><br/> Investigation 5, Parts 1-3<br/> <b>Pebbles, Sand and Silt</b><br/> Investigation 4, Parts 1-3<br/> <b>Insects and Plants</b><br/> Investigation 5, Parts 1-3</p>  | <p>Pages 13-25<br/> Pages 10-24<br/> Pages 8-25<br/> Pages 206-225</p>                                |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <p><i>Scope and Sequence - All Units</i><br/> a. Compare explanations with prior knowledge</p> | <p>FOSS investigations encourage evaluation of explanations. See for example:<br/> <b>Solids and Liquids</b><br/> Investigation 4, Part 3<br/> <b>Insects</b><br/> Investigation 2, Part 2<br/> <b>New Plants</b><br/> Investigation 4, Part 2<br/> <b>Insects and Plants</b><br/> Investigation 4, Part 2</p> | <p>Pages 23-27<br/> Pages 14-19<br/> Pages 13-19<br/> Pages 157-163</p> |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <p><i>Scope and Sequence - All Units</i><br/> a. Communicate simple procedures and results of investigations and explanations through:<br/> oral presentations<br/> drawings and maps<br/> data tables<br/> graphs (bar, pictographs)<br/> writings</p> | <p>FOSS investigations emphasize student communication. See for example:<br/> <b>Air and Weather</b><br/> Investigation 4, Parts 1, 3<br/> <b>Insects</b><br/> Investigation 2, Parts 2-3<br/> Investigation 4, Parts 2, 4<br/> <b>New Plants</b><br/> Investigation 1, Part 3<br/> Investigation 2, Parts 1-3<br/> <b>Plants and Animals</b><br/> Investigation 1, Part 3</p> | <p>Pages 8-11, 19-21<br/> Pages 14-24<br/> Pages 14-18, 23-27<br/> Pages 23-30<br/> Pages 8-28<br/> Pages 63-72</p> |

|  |  |             |
|--|--|-------------|
|  | <b>Insects and Plants</b><br>Investigation 1, Part 3 | Pages 71-75 |
|--|--|-------------|

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Properties of Matter/Weather and Seasons</i>                                      |   |   |
| a. Recognize some objects occur in nature (natural objects); others have been designed and made by people | <b>Pebbles, Sand and Silt</b><br>Investigation 1, Part 1<br>Investigation 2, Part 1<br>Investigation 3, Parts 1-5<br>Science Stories<br>FOSS Web, Activity: Find Earth Materials<br><b>Insects</b><br>Investigation 1-6<br>Science Stories<br>FOSS Web, Activity: Insect Hunt<br><b>Solids and Liquids</b><br>Science Stories<br><b>New Plants</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Parts 1-3<br>Science Stories<br>FOSS Web, Activity: Watch it Grow<br><b>Plants and Animals</b><br>Investigation 1-4, all parts<br>Science Resources<br><b>Insects and Plants</b><br>Investigation 1-5<br>Science Resources | Pages 8-12<br>Pages 8-13<br>Pages 8-29<br>Pages 3-19<br><br>Pages 3-35<br><br>Pages 3-13<br><br>Pages 13-30<br>Pages 8-25<br>Pages 4-21<br><br>Pages 3-50<br><br>Pages 3-55 |

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Properties of Matter/Characteristics of Plants and Animals</i>                           |   |  |
| a. Describe how tools have helped scientists make better observations (e.g., magnifiers, balances, thermometers) | <b>Insects</b><br>Investigation 1, Parts 1-3<br>Investigation 2, Parts 1-2<br><b>Air and Weather</b><br>Investigation 2, Parts 2, 4<br><b>Pebbles, Sand and Silt</b><br>Investigation 1, Parts 1-3<br><b>Insects and Plants</b><br>Investigation 1, Parts 1-3<br>Investigation 5, Parts 1-3 | Pages 8-24<br>Pages 8-19<br><br>Pages 14-19, 24-27<br><br>Pages 8-21<br><br>Pages 52-75<br>Pages 206-225 |

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)</p> <p>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)</p> | <p>FOSS investigations provide opportunity to identify questions/problems and to solve them. See for example:</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Part 3<br/>Investigation 4, Parts 1-2</p> <p><b>Balance and Motion</b><br/>Investigation 1, Part 3<br/>Investigation 3, Part 2</p> <p><b>New Plants</b><br/>Investigation 2, Parts 2-3</p> <p><b>Plants and Animals</b><br/>Investigation 1, Parts 2-3</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Part 3<br/>Investigation 4, Parts 1-2</p> <p><b>Balance and Motion</b><br/>Investigation 1, Part 3<br/>Investigation 3, Part 2</p> <p><b>New Plants</b><br/>Investigation 2, Parts 2-3</p> <p><b>Plants and Animals</b><br/>Investigation 1, Parts 2-3</p> | <p>Pages 21-24<br/>Pages 7-22</p> <p>Pages 19-23<br/>Pages 13-18</p> <p>Pages 15-28<br/>Pages 58-72</p> <p>Pages 21-24<br/>Pages 7-22</p> <p>Pages 19-23<br/>Pages 13-18</p> <p>Pages 15-28<br/>Pages 58-72</p> |

# GRADE TWO

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A:** Objects, and the materials they are made of, have properties that can be used to describe and classify them

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence – Properties of Rocks and Soil</i>   |  |   |
| a. Describe and compare the physical properties of objects by using simple tools (i.e., thermometer, magnifier, centimeter ruler, balance, magnet) | <b>Pebbles, Sand and Silt</b><br>Investigation 1, Parts 1-3<br>Investigation 4, Part 1<br><b>Air and Weather</b><br>Investigation 2, Parts 2, 4<br><b>Solids and Liquids</b><br>Investigation 2, Part 3                  | Pages 8-21<br>Pages 8-14<br><br>Pages 14-19, 24-27<br><br>Pages 21-27                         |
| b. Classify objects as “one kind of material” or a mixture   | <b>Solids and Liquids</b><br>Investigation 3, Parts 1-4<br>Investigation 4, Parts 1-2<br>Science Stories<br><b>Pebbles, Sand and Silt</b><br>Investigation 2, Parts 1, 3-4<br>Investigation 4, Part 1<br>Science Stories | Pages 8-27<br>Pages 7-22<br>Pages 18-23<br><br>Pages 8-13, 18-29<br>Pages 8-14<br>Pages 20-23 |

**Concept B:** Properties of mixtures depend upon the concentrations, properties, and interactions of particles

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <i>Scope and Sequence – Properties of Rocks and Soil</i>  |  |   |
| a. Observe and describe how mixtures are made by combining solids   | <b>Solids and Liquids</b><br>Investigation 3, Parts 2, 4<br>Science Stories<br><b>Pebbles, Sand and Silt</b><br>Investigation 2, Parts 1-4<br>Investigation 4, Part 1                    | Pages 14-18, 24-27<br>Pages 18-21<br><br>Pages 8-29<br>Pages 8-14 |
| b. Describe ways to separate the components of a mixture by their physical properties (e.g., sorting, magnets, screening) | <b>Solids and Liquids</b><br>Investigation 3, Parts 2, 4<br>Investigation 3, Science Extension<br><b>Pebbles, Sand and Silt</b><br>Investigation 2, Parts 1-4<br>Investigation 4, Part 1 | Pages 14-18, 24-27<br><br>Page 31<br><br>Pages 8-29<br>Pages 8-14 |

2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems

**Concept A:** Forms of energy have a source, a means of transfer (work and heat), and a receiver

| Grade Level Expectation  | FOSS   | Page(s) |
|--|--|---------|
| <i>Scope and Sequence – Forms of Energy: Sound</i>                                   |  |         |
| a. Recognize that sound travels through different mediums (i.e., air, water, solids) | <b>Balance and Motion</b><br>Science Stories | Page 32 |

|  |  |             |
|--|--|-------------|
| b. Describe different ways to change the pitch of a sound (i.e., changes in size, such as length or thickness/tension of the source) | <b>Balance and Motion</b><br>Science Stories | Pages 33-35 |
| c. Describe how the ear serves as a receiver of sound (i.e., sound vibrates eardrum)   |  |             |

## STRAND 2

### Properties and Principles of Force and Motion

#### 2. Forces affect motion

**Concept A:** Forces are classified as either contact (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude)

| Grade Level Expectation   | FOSS  | Page(s)                |
|---|---|------------------------|
| <i>Scope and Sequence – Forces and Motion</i>   |   |                        |
| a. Recognize magnets attract and repel each other and certain materials   | <b>Solids and liquids</b><br>Investigation 3, Science Extension<br><b>Balance and Motion</b><br>Science Stories | Page 31<br>Pages 18-21 |
| b. Describe magnetism as a force that can push or pull other objects without touching them  | <b>Balance and Motion</b><br>Science Stories  | Page 18                |
| c. Measure (using non-standard units) and compare the force (i.e., push or pull) required to overcome friction and move an object over different surfaces (i.e., rough, smooth) |   |                        |

**Concept B:** Every object exerts a gravitational force on every other object

| Grade Level Expectation   | FOSS   | Page(s) |
|---|--|---------|
| <i>Scope and Sequence – Forces and Motion</i>   |  |         |
| a. Describe Earth's gravity as a force that pulls objects on or near the Earth toward the Earth without touching the object | <b>Balance and Motion</b><br>Science Stories | Page 29 |

**Concept D:** Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion

| Grade Level Expectation   | FOSS  | Page(s)    |
|---|---|------------|
| <i>Scope and Sequence – Forces and Motion</i>                                   |   |            |
| a. Describe the direction and amount of force (i.e., direction of push or pull, | <b>Balance and Motion</b><br>Investigation 3, Parts 1-3<br>Investigation 3, Science | Pages 6-25 |

|  |  |   |
|--|--|---|
| <p>strong/weak push or pull) needed to change an object's motion (i.e., faster/slower, change in direction)</p> <p>b. Describe and compare the distances traveled by heavier/lighter objects after applying the same amount of force (i.e., push or pull) in the same direction</p> <p>c. Describe and compare the distances traveled by objects with the same mass after applying different amounts of force (i.e., push or pull) in the same direction</p> | <p>Extension<br/><b>Air and Weather</b><br/>Investigation 1, Parts 4-6<br/>Investigation 3, Part 3</p> | <p>Page 28<br/><br/>Pages 21-38<br/>Pages 17-21</p> |
|--|--|---|

**Concept F: Simple machines (levers, inclined planes, wheel and axle, pulleys) affect the force applied to an object and/or direction of movement as work is done**

| Grade Level Expectation  | FOSS | Page(s) |
|--|------|---------|
| <p><i>Scope and Sequence – Forces and Motion</i></p> <p>a. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using inclined planes (ramps) of different slopes</p> <p>b. Compare and describe the amount of force (i.e., more, less, or same push or pull) needed to raise an object to a given height, with or without using levers</p> <p>c. Apply the use of an inclined plane (ramp) and/or lever to different real life situations in which objects are raised</p> |      |         |

**STRAND 3**

**Characteristics and Interactions of Living Organisms**

**1. There is a fundamental unity underlying the diversity of all living organisms**

**Concept B: Organisms progress through life cycles unique to different types of organisms**

| Grade Level Expectation  | FOSS                  | Page(s) |
|--|-----------------------|---------|
| <p><i>Scope and Sequence – Life Cycles of Animals</i></p> <p>a. Recognize that animals</p> | <p><b>Insects</b></p> |         |

|  |   |  |
|--|---|--|
| progress through life cycles of birth, growth and development, reproduction, and death         | Investigation 1-5<br>Science Stories<br><b>Insects and Plants</b><br>Investigation 1, 3-5, all parts<br>Science Resources   | Pages 16-33<br><br>Pages 37-55   |
| b. Record observations on the life cycle of different animals (e.g., butterfly, frog, chicken) | <b>Insects</b><br>Investigation 1-5<br><b>Insects and Plants</b><br>Investigation 1, 3-5, all parts   |  |
| c. Sequence the stages in the life cycle of animals (i.e., butterfly, frog, chicken)           | <b>Insects</b><br>Investigation 1, Part 3<br>Investigation 3, Part 3<br>Investigation 5, Part 3<br>Science Stories<br><b>Insects and Plants</b><br>Investigation 1, Part 3<br>Investigation 3, Part 3<br>Investigation 5, Part 3<br>Science Resources | Pages 22-25<br>Pages 21-26<br>Pages 20-24<br>Page 24<br><br>Pages 71-75<br>Pages 145-151<br>Pages 219-225<br>Pages 37-46 |

**3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes**

**Concept D: There is heritable variation within every species of organism**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Life Cycles of Animals</i>   |   |  |
| a. Identify and relate the similarities and differences between animal parents and their offspring | <b>Insects</b><br>Investigation 1-5<br>Science Stories<br><b>Insects and Plants</b><br>Investigation 3, Part 3<br>Science Resources         | Pages 16-24, 26-33<br><br>Pages 145-151<br>Pages 20-25, 42 |
| b. Recognize similarities and differences among multiple offspring of an animal parent             | <b>Insects</b><br>Investigation 1-5<br>Science Stories<br><b>Insects and Plants</b><br>Investigation 1, 3-5, all parts<br>Science Resources | Pages 22-24, 26-33<br><br>Pages 20-23, 42                  |

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

Not assessed at this level

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

**1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

| Grade Level Expectation                                      | FOSS                          | Page(s) |
|--|-------------------------------|---------|
| <i>Scope and Sequence – Earth Materials: Rocks and Soils</i> |                               |         |
| a. Observe and describe the                                  | <b>Pebbles, Sand and Silt</b> |         |

|  |   |  |
|--|---|--|
| physical properties (e.g., odor, color, appearance, relative grain size, texture, absorption of water) and different components (i.e., sand, clay, humus) of soils | Investigation 2, Parts 3-4<br>Investigation 4, Parts 1-3<br>Science Stories   | Pages 18-29<br>Pages 8-25<br>Pages 20-23     |
| b. Observe and describe the physical properties of rocks (e.g., size, shape, color, presence of fossils)   | <b>Pebbles, Sand and Silt</b><br>Investigation 1, Parts 1-3<br>Investigation 2, Parts 1-4<br>Science Stories<br>FOSS Web, Photo Gallery:<br>Rock Quarry | Pages 8-21<br>Pages 8-29<br>Pages 3-9, 26-27 |

**2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept A: The Earth's materials and surface features are changed through a variety of external processes**

| Grade Level Expectation  | FOSS   | Page(s)            |
|--|--|--------------------|
| <i>Scope and Sequence – Earth Materials: Rocks and Soils</i><br>a. Observe and recognize examples of slow changes in the Earth's surface and surface materials (e.g., rock, soil layers) due to processes such as decay (rotting), freezing, thawing, breaking, or wearing away by running water or wind | <b>Pebbles, Sand and Silt</b><br>Science Stories | Pages 10-13, 20-21 |

**3. Human activity is dependent upon and affects Earth's resources and systems**

**Concept A: Earth's materials are limited natural resources affected by human activity**

| Grade Level Expectation  | FOSS  | Page(s)                   |
|--|---|---------------------------|
| <i>Scope and Sequence – Earth Materials: Rocks and Soil</i><br>a. Observe and describe ways humans use Earth's materials (e.g., soil, rocks) in daily life | <b>Pebbles, Sand and Silt</b><br>Investigation 3, Parts 1-5<br>Science Stories<br>FOSS Web, Photo Gallery:<br>Rock Uses | Pages 8-29<br>Pages 16-19 |

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation                                   | FOSS                      | Page(s) |
|---|---------------------------|---------|
| Scope and Sequence – All Units<br>a. Pose questions about | FOSS modules emphasize an |         |

|  |  |  |
|--|--|--|
| <p>objects, materials, organisms, and events in the environment</p> <p>b. Plan and conduct a simple investigation (fair test) to answer a question</p> | <p>inquiry approach. Students ask questions and seek answers. See for example:</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Part 2</p> <p><b>Pebbles, Sand and Silt</b><br/>Investigation 2, Parts 1-4<br/>Investigation 4, Parts 1-3</p> <p><b>New Plants</b><br/>Investigation 2, Part 2</p> <p><b>Insects and Plants</b><br/>Investigation 3, Parts 1-3</p> <p><b>Plants and Animals</b><br/>Investigation 1, Part 2</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Part 3<br/>Investigation 4, Parts 1-2</p> <p><b>New Plants</b><br/>Investigation 2, Part 2</p> <p><b>Balance and Motion</b><br/>Investigation 3, Parts 1-3</p> <p><b>Plants and Animals</b><br/>Investigation 1, Part 2</p> | <p>Pages 17-20</p> <p>Pages 8-29<br/>Pages 8-25</p> <p>Pages 15-19</p> <p>Pages 120-140</p> <p>Pages 58-62</p> <p>Pages 21-24<br/>Pages 7-22</p> <p>Pages 15-19</p> <p>Pages 6-25</p> <p>Pages 58-62</p> |
|--|--|--|

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Make qualitative observations using the five senses</p> <p>b. Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, magnets, equal arm balances, thermometers)</p> <p>c. Measure length, mass, and temperature using standard and non-standard units</p> | <p>FOSS investigations emphasize student observation. See for example:</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Parts 1-2<br/>Investigation 2, Parts 1-3</p> <p><b>Pebbles, Sand and Silt</b><br/>Investigation 4, Parts 1, 3</p> <p><b>Air and Weather</b><br/>Investigation 1, Parts 1-4</p> <p><b>Insects and Plants</b><br/>Investigation 3, Parts 1-3</p> <p><b>Plants and Animals</b><br/>Investigation 3, Parts 1-2</p> <p><b>Insects</b><br/>Investigation 1, Parts 1-3<br/>Investigation 2, Parts 1-2</p> <p><b>Air and Weather</b><br/>Investigation 2, Parts 2, 4</p> <p><b>Pebbles, Sand and Silt</b><br/>Investigation 1, Parts 1-3</p> <p><b>Insects and Plants</b><br/>Investigation 1, Parts 1-3</p> <p><b>Air and Weather</b><br/>Investigation 2, Parts 2, 4</p> <p><b>New Plants</b><br/>Investigation 2, Part 3</p> <p><b>Balance and Motion</b><br/>Investigation 1, Math</p> | <p>Pages 8-20<br/>Pages 10-27</p> <p>Pages 8-14, 19-25</p> <p>Pages 8-26</p> <p>Pages 206-211</p> <p>Pages 120-134</p> <p>Pages 8-24<br/>Pages 8-19</p> <p>Pages 14-19, 24-27</p> <p>Pages 8-21</p> <p>Pages 52-75</p> <p>Pages 14-19, 24-27</p> <p>Pages 20-28</p> |

|                                 |   |               |
|---------------------------------|---|---------------|
| d. Compare amounts/measurements | Extension   | Page 30       |
|                                 | <b>Insects and Plants</b><br>Investigation 2, Part 3        | Pages 105-115 |
|                                 | <b>Plants and Animals</b><br>Investigation 1, Part 3        | Pages 63-72   |
|                                 | <b>Solids and Liquids</b><br>Investigation 2, Part 3        | Pages 21-27   |
|                                 | <b>Air and Weather</b><br>Investigation 2, Part 4           | Pages 24-27   |
|                                 | <b>Pebbles, Sand and Silt</b><br>Investigation 2, Parts 1-3 | Pages 8-23    |
|                                 | Investigation 4, Part 1                                     | Pages 8-14    |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence - All Units</i>   |  |  |
| a. Use observations as support for reasonable explanations                                      | FOSS investigations emphasize the use of evidence to formulate explanations. See for example:<br><b>Balance and Motion</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Parts 1-2<br><b>Solids and Liquids</b><br>investigation 2, Part 3<br>Investigation 4, Parts 1-2<br><b>Pebbles, Sand and Silt</b><br>Investigation 2, Part 3<br><b>Plants and Animals</b><br>Investigation 1, Part 2 | Pages 14-23<br>Pages 6-18<br><br>Pages 21-27<br>Pages 7-22<br><br>Pages 18-23<br><br>Pages 62-70 |
| b. Use observations to describe relationships and patterns and to make predictions to be tested | <b>Balance and Motion</b><br>Investigation 3, Parts 2-3<br><b>Insects</b><br>Investigation 5, Parts 1-3<br><b>Pebbles, Sand and Silt</b><br>Investigation 4, Part 1<br><b>Insects and Plants</b><br>Investigation 5, Parts 1-3   | Pages 13-25<br><br>Pages 10-24<br><br>Pages 8-25<br><br>Pages 206-225                            |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation                      | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence - All Units</i>        |   |   |
| a. Compare explanations with prior knowledge | FOSS investigations encourage evaluation of explanations. See for example:<br><b>Solids and Liquids</b><br>Investigation 4, Part 3<br><b>Insects</b><br>Investigation 2, Part 2<br><b>New Plants</b><br>Investigation 4, Part 2<br><b>Insects and Plants</b><br>Investigation 4, Parts 2<br>Investigation 5, Part 3 | Pages 23-27<br><br>Pages 14-19<br><br>Pages 13-19<br><br>Pages 157-163<br>Pages 219-225 |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence - All Units</i>  |   |  |
| a. Communicate simple procedures and results of investigations and explanations through:<br>oral presentations<br>drawings and maps<br>data tables<br>graphs<br>(bar, pictographs)<br>writings | FOSS investigations emphasize student communication. See for example:<br><b>Air and Weather</b><br>Investigation 4, Parts 1, 3<br><b>Insects</b><br>Investigation 2, parts 2-3<br>Investigation 4, Parts 2, 4<br><b>New Plants</b><br>Investigation 1, Part 3<br>Investigation 2, Parts 1-3<br><b>Insects and Plants</b><br>Investigation 1, Part 3<br><b>Plants and Animals</b><br>Investigation 1, Part 3 | Pages 8-11, 19-21<br><br>Pages 14-24<br>Pages 14-18, 232-27<br><br>Pages 23-30<br>Pages 8-28<br><br>Pages 71-75<br><br>Pages 63-72 |

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| Grade Level Expectation   | FOSS   | Page(s) |
|---|--|---------|
| <i>Scope and Sequence – Forms of Energy: Sound</i>  |  |         |
| a. Design and construct a musical instrument using materials (e.g., cardboard, wood, plastic, metal) and/or existing objects (e.g., toy wheels, gears, boxes, sticks) that can be used to perform a task (Assess Locally) | <b>Air and Weather</b><br>Investigation 3, Science Extension | Page 36 |

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Forms of Energy: Sound/Properties of Rocks and Soil</i>   |   |   |
| a. Describe how tools have helped scientists make better observations, measurements, or equipment for investigations (e.g., magnifiers, balances, stethoscopes, thermometers) | <b>Insects</b><br>Investigation 1, Parts 1-3<br>Investigation 2, Parts 1-2<br><b>Air and Weather</b><br>Investigation 2, Parts 2, 4<br><b>Pebbles, Sand and Silt</b><br>Investigation 1, Parts 1-3<br><b>Insects and Plants</b><br>Investigation 3, Parts 1-3 | Pages 8-24<br>Pages 8-19<br><br>Pages 14-19, 24-27<br><br>Pages 8-21<br><br>Pages 52-75 |

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of individuals solving everyday problems or learning through discovery)</p> <p>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)</p> | <p>FOSS investigations provide opportunity to identify questions/problems and to solve them. See for example:</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Part 3<br/>Investigation 4, Parts 1-2</p> <p><b>Balance and Motion</b><br/>Investigation 1, Part 3<br/>Investigation 3, Part 2</p> <p><b>New Plants</b><br/>Investigation 2, Parts 2-3</p> <p><b>Plants and Animals</b><br/>Investigation 1, Parts 1-2</p> <p><b>Solids and Liquids</b><br/>Investigation 1, Part 3<br/>Investigation 4, Parts 1-2</p> <p><b>Balance and Motion</b><br/>Investigation 1, Part 3<br/>Investigation 3, Part 2</p> <p><b>New Plants</b><br/>Investigation 2, Parts 2-3</p> <p><b>Plants and Animals</b><br/>Investigation 1, Parts 1-2</p> | <p>Pages 21-24<br/>Pages 7-22</p> <p>Pages 19-23<br/>Pages 13-18</p> <p>Pages 15-28</p> <p>Pages 47-52</p> <p>Pages 21-24<br/>Pages 7-22</p> <p>Pages 19-23<br/>Pages 13-18</p> <p>Pages 15-28</p> <p>Pages 47-52</p> |

# GRADE THREE

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept D:** Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Investigating States of Matter</i>  |   |   |
| a. Compare the observable physical properties of solids, liquids, or gases (air) (i.e., visible vs. invisible, changes in shape, changes in the amount of space occupied) | <b>Earth Materials</b><br>Investigation 1, Parts 1-3<br>Investigation 2, Part 1<br><b>Water</b><br>Investigation 1, Parts 1-3<br><b>Matter and Energy</b><br>Investigation 3, Part 1<br>Science Resources   | Pages 8-29<br>Pages 8-13<br><br>Pages 8-23<br><br>Pages 129-138<br>Pages 39-42, 49-50   |
| b. Identify everyday objects/substances as solid, liquid, or gas (e.g., air, water)   | <b>Earth Materials</b><br>Investigation 1, Parts 1- 3<br>Science Stories<br><b>Water</b><br>Investigation 1, Part 1<br>Investigation 2, Part 3<br>Investigation 3, Parts 1, 4<br>Science Stories<br><b>Measurement</b><br>Science Stories<br><b>Matter and Energy</b><br>Investigation 3, Part 1<br>Science Resources | Pages 8-29<br>Pages 30-37<br><br>Pages 8-13<br>Pages 19-24<br>Pages 8-11, 21-26<br>Pages 1-2, 4, 8-9, 13-16<br><br>Pages 22-23<br><br>Pages 129-138<br>Pages 39-42, 49-50 |
| c. Recognize water evaporates (liquid water changes into a gas as it moves into the air)  | <b>Water</b><br>Investigation 3, Parts 1-3<br>Science Stories<br>FOSS Web, Activity:<br>Evaporation<br><b>Matter and Energy</b><br>Investigation 4, Part 2<br>Science Resources   | Pages 8-20<br>Pages 13-15<br><br>Pages 181-192<br>Page 56   |
| d. Measure and compare the temperature of water when it exists as a solid to its temperature when it exists as a liquid   | <b>Water</b><br>Investigation 2, Science<br>Extension<br>Science Stories  | Page 27<br>Page 8   |
| e. Investigate and recognize water can change from a liquid to a solid (freeze), and back again to a liquid (melt), as the result of temperature changes                  | <b>Water</b><br>Investigation 2, Part 3<br>Investigation 2, Science<br>Extension<br>Science Stories   | Pages 19-24<br><br>Page 27<br>Pages 8-9, 14   |
| f. Describe the changes in the physical properties of   | <b>Water</b><br>Investigation 2, Part 3   | Pages 19-24   |

|   |  |  |
|---|--|--|
| water (i.e., shape, volume) when frozen or melted   | Investigation 2, Science Extension<br>Science Stories  | Page 27<br>Pages 8-9                                 |
| g. Predict and investigate the effect of heat energy (i.e., change in temperature, melting, evaporation) on objects and materials | <b>Water</b><br>Investigation 2, Part 3<br>Science Stories<br><b>Measurement</b><br>Investigation 4, Part 2<br><b>Matter and Energy</b><br>Science Resources | Pages 19-24<br>Page 14<br>Pages 14-17<br>Pages 54-56 |

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence – Investigating States of Matter</i>  |   |  |
| a. Identify sources of thermal energy (e.g., Sun, stove, fire, body) that can cause solids to change to liquids, and liquids to change to gas | <b>Water</b><br>Science Stories<br><b>Matter and Energy</b><br>Science Resources  | Pages 13-15<br>Pages 2-3, 19, 54-55                      |
| <i>Scope and Sequence – Earth, Sun, and Moon</i>  |   |  |
| a. Identify sources of light energy (e.g., Sun, bulbs, flames)  | <b>Ideas and Inventions</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources<br><b>Matter and Energy</b><br>Investigation 2, Part 1<br>Science Resources | Pages 23-27<br>Pages 1-3<br>Pages 93-102<br>Pages 24-25  |
| b. Recognize light can be transferred from the source to the receiver (eye) through space   | <b>Ideas and Inventions</b><br>Investigation 4, Part 1<br>Science Stories<br><b>Matter and Energy</b><br>Investigation 2, Parts 1-2<br>Science Resources                      | Pages 8-13<br>Pages 23-27<br>Pages 93-114<br>Pages 24-36 |
| c. Identify the three things (light source, object, and surface) necessary to produce a shadow  | <b>Ideas and Inventions</b><br>Science Stories<br><b>Matter and Energy</b><br>Investigation 2, Part 2   | Pages 26-27<br>Pages 103-114                             |

## STRAND 2

### Properties and Principles of Force and Motion

Not assessed at this level

## STRAND 3

### Characteristics and Interactions of Living Organisms

#### 1. There is a fundamental unity underlying the diversity of all living organisms

##### **Concept A: Organisms have basic needs for survival**

| Grade Level Expectation  | FOSS  | Page(s)                    |
|--|---|----------------------------|
| <i>Scope and Sequence – Plants</i><br>a. Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature) | <b>Structures of Life</b><br>Investigation 2, Part 2<br>Science Stories | Pages 14-17<br>Pages 10-11 |

##### **Concept B: Organisms progress through life cycles unique to different types of organisms**

| Grade Level Expectation   | FOSS  | Page(s)     |
|---|---|-------------|
| <i>Scope and Sequence – Plants</i><br>a. Recognize plants progress through life cycles of seed germination, growth and development, reproduction, and death | <b>Structures of Life</b><br>Investigation 2, Parts 1-3 | Pages 8-22  |
| c. Sequence and describe the stages in the life cycle of a flowering plant  | <b>Structures of Life</b><br>Investigation 2, Part 3    | Pages 18-22 |

##### **Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

| Grade Level Expectation   | FOSS  | Page(s) |
|---|---|---------|
| <i>Scope and Sequence – Plants</i><br>a. Identify the major organs (roots, stems, flowers, leaves) and their functions in vascular plants (e.g., absorption, transport, reproduction) (Do NOT assess the term vascular) | This topic is addressed in the grade two module <u>New Plants</u> . |         |

#### 2. Living organisms carry out life processes in order to survive

##### **Concept C: Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means**

| Grade Level Expectation  | FOSS | Page(s) |
|--|------|---------|
| <i>Scope and Sequence – Plants</i><br>a. Illustrate and trace the path of water and nutrients as they move through the transport system of a plant |      |         |

#### 3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes

##### **Concept D: There is heritable variation within every species of organism**

| Grade Level Expectation  | FOSS  | Page(s)    |
|--|---|------------|
| <i>Scope and Sequence – Plants</i><br>a. Identify and relate the similarities and differences between plants and their offspring (i.e., seedlings) | <b>Structures of Life</b><br>Investigation 2, Parts 1-3 | Pages 8-22 |

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

#### 2. Matter and energy flow through an ecosystem

**Concept A:** As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use

| Grade Level Expectation  | FOSS   | Page(s) |
|--|--|---------|
| <i>Scope and Sequence – Food Chains</i>  |  |         |
| a. Identify sunlight as the primary source of energy plants use to produce their own food              | <b>Structures of Life</b><br>Science Stories | Page 43 |
| b. Classify populations of organisms as producers or consumers by the role they serve in the ecosystem |  |         |
| c. Sequence the flow of energy through a food chain beginning with the Sun                             |  |         |
| d. Predict the possible effects of removing an organism from a food chain                              |  |         |

## STRAND 5

### Processes and Interactions of the Earth’s Systems (Geosphere, Atmosphere, and Hydrosphere)

#### 1. Earth’s systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept C:** The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles

| Grade Level Expectation  | FOSS  | Page(s)                   |
|--|---|---------------------------|
| <i>Scope and Sequence – Investigating States of Matter</i>             |   |                           |
| a. Recognize liquid water can change into a gas (vapor) in the air     | <b>Water</b><br>Investigation 3, Parts 1-3<br>Science Stories<br>FOSS Web, Activity:<br>Evaporation<br><b>Matter and Energy</b><br>Investigation 4, Part 2<br>Science Resources | Pages 8-20<br>Pages 13-15 |
| b. Recognize clouds and fog are made of tiny droplets of water         |   |                           |
| c. Recognize air is a substance that surrounds us, takes up space, and | <b>Water</b><br>Science Stories   | Pages 14-15               |
|  | <b>Water</b><br>Science Stories   | Page 14                   |

| moves around us as wind   |   |                    |
|---|---|--------------------|
| <p><b>2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes</b><br/> <b>Concept E: Changes in the form of water as it moves through Earth's systems are described as the water cycle</b></p> |   |                    |
| Grade Level Expectation   | FOSS                                    | Page(s)            |
| <p><i>Scope and Sequence – Investigating States of Matter</i></p> <p>a. Describe clouds and precipitation as forms of water</p>   | <p><b>Water</b><br/>Science Stories</p> | <p>Pages 14-15</p> |

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

**1. The universe has observable properties and structure**

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

| Grade Level Expectation   | FOSS   | Page(s)                                  |
|---|--|--|
| <p><i>Scope and Sequence – Earth, Sun, and Moon</i></p> <p>a. Describe our Sun as a star because it provides light energy to the solar system</p> | <p><b>Ideas and Inventions</b><br/>Science Stories</p> <p><b>Sun, Moon and Stars</b><br/>Science Resources</p> | <p>Pages 33, 37</p> <p>Pages 2-3, 35</p> |
| <p>b. Recognize the moon is a reflector of light</p>  | <p><b>Ideas and Inventions</b><br/>Science Stories</p> <p><b>Sun, Moon and Stars</b><br/>Science Resources</p> | <p>Page 34</p> <p>Pages 19, 32</p>       |

**2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces**

**Concept A: The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <p><i>Scope and Sequence – Earth, Sun, and Moon</i></p> <p>a. Illustrate and describe how the Sun appears to move slowly across the sky from east to west during the day</p> | <p><b>Ideas and Inventions</b><br/>Science Stories</p> <p><b>Sun, Moon and Stars</b><br/>Investigation 1, Parts 1-2<br/>Science Resources</p> | <p>Page 33</p> <p>Pages 42-64</p> <p>Pages 1-2, 4-6, 10-11</p> |

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

| Grade Level Expectation  | FOSS   | Page(s)                                |
|--|--|--|
| <p><i>Scope and Sequence – Earth, Sun, and Moon</i></p> <p>a. Illustrate and describe how the moon appears to move slowly across the sky from east to west during the day and/or night</p> | <p><b>Sun, Moon and Stars</b><br/>Investigation 2, Parts 1-2<br/>Science Resources</p>   | <p>Pages 79-100</p> <p>Pages 20-33</p> |
| <p>b. Observe the change in the moon's appearance relative to time of day and</p>  | <p><b>Ideas and Inventions</b><br/>Science Stories</p> <p><b>Sun, Moon and Stars</b></p> | <p>Pages 34-35</p>                     |

|   |                         |              |
|---|-------------------------|--------------|
| month over several months and note the pattern in this change | Investigation 2, Part 2 | Pages 89-100 |
|---|-------------------------|--------------|

**Concept C: The regular and predictable motions of the Earth and moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

| Grade Level Expectation   | FOSS  | Page(s)                                    |
|---|---|--|
| <i>Scope and Sequence – Earth, Sun, and Moon</i>  |   |  |
| a. Recognize there is a day/night cycle<br>Every 24 hours   | <b>Ideas and Inventions</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources                               | Page 33<br>Pages 1-3                       |
| b. Describe the changes in length and position (direction) of shadows from morning to midday to afternoon | <b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br>Science Resources   | Page 43-64<br>Pages 4-6, 10-11             |
| c. Describe how the Sun’s position in the sky changes the length and position of shadows                  | <b>Ideas and Inventions</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br>Science Resources | Page 33<br>Pages 42-64<br>Pages 4-6, 10-11 |

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence - All Units</i>  |  |   |
| a. Pose questions about objects, materials, organisms, and events in the environment | FOSS modules emphasize an inquiry approach. Students ask questions and seek answers. See for example:<br><b>Ideas and Inventions</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-2<br><b>Earth Materials</b><br>Investigation 3, Part 1<br><b>Water</b><br>Investigation 3, Parts 1-4<br><b>Physics of Sound</b><br>Investigation 2, Parts 1-3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 2, Parts 1-2 | Pages 8-19<br>Pages 8-17<br>Pages 8-15<br>Pages 8-26<br>Pages 8-24<br>Pages 42-64<br>Pages 93-114 |
| b. Plan and conduct a fair test to answer a question                                 | <b>Ideas and Inventions</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-2<br><b>Earth Materials</b>  | Pages 8-19<br>Pages 8-17  |

|  |  |               |
|--|--|---------------|
|  | Investigation 3, Part 1<br><b>Water</b>                | Pages 8-15    |
|  | Investigation 3, Parts 1-4<br><b>Physics of Sound</b>  | Pages 8-26    |
|  | Investigation 2, Parts 1-3<br><b>Matter and Energy</b> | Pages 8-24    |
|  | Investigation 3, Part 2                                | Pages 139-150 |

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence - All Units</i>  |   |   |
| a. Make qualitative observations using the five senses   | FOSS investigations emphasize student observation. See for example:<br><b>Physics of Sound</b><br>Investigation 1, Parts 1-2<br><b>Structures of Life</b><br>Investigation 1, Parts 1-2<br><b>Earth Materials</b><br>Investigation 2, Parts 1-2<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 2, Parts 1-2 | Pages 8-20<br>Pages 8-27<br>Pages 8-21<br>Pages 42-64<br>Pages 93-114                   |
| b. Make observations using simple tools and equipment (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders) | <b>Measurement</b><br>Investigation 2, Parts 1-3<br><b>Structures of Life</b><br>Investigation 2, Part 1<br><b>Earth Materials</b><br>Investigation 1, Parts 1-3<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3<br>Investigation 4, Part 1   | Pages 8-24<br>Pages 8-13<br>Pages 8-29<br>Pages 139-150<br>Pages 174-180                |
| c. Measure length to the nearest centimeter, mass using grams, temperature using degrees Celsius, volume using liters                          | <b>Measurement</b><br>Investigation 1, Parts 2-3<br><b>Structures of Life</b><br>Investigation 2, Part 3<br><b>Human Body</b><br>Investigation 4, Part 1<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3<br>Investigation 4, Part 1   | Pages 16-24<br>Pages 18-22<br>Pages 8-16<br>Pages 139-150<br>Pages 174-1180             |
| d. Compare amounts/measurements  | <b>Water</b><br>Investigation 3, Parts 1-3<br><b>Measurement</b><br>Investigation 2, Part 3<br>Investigation 3, Part 3<br><b>Magnetism and Electricity</b><br>Investigation 1, Part 3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Part 2<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3  | Pages 8-20<br>Pages 18-24<br>Pages 18-21<br>Pages 23-29<br>Pages 56-64<br>Pages 139-160 |
| e. Judge whether measurements and  | <b>Measurement</b><br>Investigation 1, Parts 2-3  | Pages 16-24   |

|  |  |                                  |
|--|--|----------------------------------|
| computation of quantities are reasonable | Investigation 3, Parts 2-3<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3 | Pages 14-21<br><br>Pages 139-160 |
|--|--|----------------------------------|

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence - All Units</i>  |  |  |
| a. Use quantitative and qualitative data as support for reasonable explanations                      | FOSS investigations emphasize the use of evidence to formulate explanations. See for example:<br><b>Human Body</b><br>Investigation 4, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 2<br><b>Physics of Sound</b><br>Investigation 2, Parts 1-3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 3, Part 2 | Pages 17-19<br><br>Pages 14-18<br><br>Pages 8-24<br><br>Pages 42-64<br><br>Pages 139-150 |
| b. Use data as support for observed patterns and relationships, and to make predictions to be tested | <b>Human Body</b><br>Investigation 4, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 2<br><b>Physics of Sound</b><br>Investigation 2, Parts 1-3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 3, Part 2  | Pages 17-19<br><br>Pages 14-18<br><br>Pages 8-24<br><br>Pages 42-64<br><br>Pages 139-150 |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation                                    | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence - All Units</i>                      |   |   |
| a. Evaluate the reasonableness of an explanation           | FOSS investigations encourage evaluation of explanations. See for example:<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 2<br><b>Water</b><br>Investigation 3, Parts 2-3<br><b>Measurement</b><br>Investigation 2, Part 3<br><b>Matter and Energy</b><br>Investigation 4, Part 2 | Pages 14- 18<br><br>Pages 12-20<br><br>Pages 18-24<br><br>Pages 181-192 |
| b. Analyze whether evidence supports proposed explanations | <b>Magnetism and Electricity</b><br>Investigation 4, Part 2<br><b>Water</b><br>Investigation 3, Parts 2-3<br><b>Measurement</b><br>Investigation 2, Part 3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b>  | Pages 14- 18<br><br>Pages 12-20<br><br>Pages 18-24<br><br>Pages 42-64   |

|   | Investigation 3, Part 2   | Pages 139-150  |
|---|---|--|
| <b>Concept E: The nature of science relies upon communication of results and justification of explanations</b>  |   |  |
| Grade Level Expectation   | FOSS  | Page(s)  |
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Communicate simple procedures and results of investigations and explanations through:<br>oral presentations<br>drawings and maps<br>data tables<br>graphs (bar, single line, pictograph)<br>writings | FOSS investigations emphasize student communication. See for example:<br><b>Earth Materials</b><br>Investigation 2, Parts 1-2<br><b>Water</b><br>Investigation 3, Parts 2-3<br><b>Magnetism and Electricity</b><br>Investigation 1, Part 3<br>Investigation 4, Part 2<br><b>Measurement</b><br>Investigation 4, Parts 1-3<br><b>Sun, Moon and Stars</b><br>Investigation 2, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3 | Pages 8-21<br>Pages 12-20<br>Pages 23-29<br>Pages 14-18<br>Pages 8-21<br>Pages 89-100<br>Pages 139-160 |

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence – Investigating States of Matter/ Earth, Sun, and Moon</i>  |   |  |
| a. Recognize some objects or materials (e.g., Sun, fire, ice, snow) occur in nature (natural objects); others (e.g., stoves, refrigerators, bulbs, candles, lanterns) have been designed and made by people to solve human problems and enhance the quality of life (manmade objects) | <b>Magnetism and Electricity</b><br>Science Stories<br><b>Ideas and Inventions</b><br>Science Stories<br><b>Water</b><br>Science Stories<br><b>Earth Materials</b><br>Science Stories<br><b>Structures of Life</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources<br><b>Matter and Energy</b><br>Science Resources | Pages 1-4, 16-23<br>Pages 1-3, 9-14, 17-22<br>Pages 1-2, 4-11, 17-20, 22-23<br>Pages 1-15, 24-37<br>Pages 1-5, 17-34<br>Pages 1-3, 14-16<br>Pages 1-4, 6-7, 9-11 |

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation   | FOSS  | Page(s)                |
|---|---|------------------------|
| <i>Scope and Sequence – Investigating States of Matter/ Earth, Sun, and Moon/Plants</i> |   |                        |
| a. Describe how new technologies have helped scientists make better observations and    | <b>Measurement</b><br>Science Stories<br><b>Ideas and Inventions</b><br>Science Stories | Pages 21-23<br>Page 38 |

|  |   |             |
|--|---|-------------|
| measurements for investigations (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers) | <b>Sun, Moon and Stars</b><br>Science Resources | Pages 40-43 |
|--|---|-------------|

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – All units</i>  |   |  |
| a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work contributed to science and technology (Assess Locally) | <b>Magnetism and Electricity</b><br>Science Stories<br><b>Ideas and Inventions</b><br>Science Stories<br><b>Structures of Life</b><br>Science Stories<br><b>Water</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources | Pages 12-23, 34-37<br>Pages 17-21<br>Pages 6-9<br>Pages 24-26<br>Pages |

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence - All Units</i>  |   |  |
| a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery) | FOSS investigations provide the opportunity to identify questions/problems and to solve them. See for example:<br><b>Water</b><br>Investigation 4, Part 2<br><b>Ideas and Inventions</b><br>Investigation 2, Part 2<br>Investigation 3, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 3<br><b>Measurement</b><br>Investigation 3, Part 3<br><b>Matter and Energy</b><br>Investigation 3, Part 2 | Pages 14-18<br>Pages 16-19<br>Pages 14-17<br>Pages 19-22<br>Pages 18-21<br>Pages 139-150 |
| b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)  | <b>Water</b><br>Investigation 4, Part 2<br><b>Ideas and Inventions</b><br>Investigation 2, Part 2<br>Investigation 3, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 3<br><b>Measurement</b><br>Investigation 3, Part 3  | Pages 14-18<br>Pages 16-19<br>Pages 14-17<br>Pages 19-22<br>Pages 18-21                  |

# GRADE FOUR

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A:** Objects, and the materials they are made of, have properties that can be used to describe and classify them

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence – Mixtures and Solutions</i>  |   |  |
| a) Describe and compare the masses of objects to the nearest gram using balance   | <b>Measurement</b><br>Investigation 2, Parts 2-3<br><b>Water</b><br>Investigation 3, Part 1<br>Investigation 1, Math Extension<br><b>Matter and Energy</b><br>Investigation 3, Part 2   | Pages 14-24<br>Pages 8-13<br>Page 26<br>Pages 139-150  |
| b) Describe and compare the volumes (the amount of space an object occupies) of objects using a graduated cylinder  | <b>Measurement</b><br>Investigation 3, Parts 1-3<br><b>Water</b><br>Investigation 3, Parts 2-3<br><b>Earth Materials</b><br>Investigation 3, Part 1<br><b>Matter and Energy</b><br>Investigation 3, Part 3  | Pages 8-21<br>Pages 12-20<br>Pages 8-13<br>Pages 151-160   |
| c. Recognize no two objects can occupy the same space at the same time (e.g., water level rises when an object or substance, such as a rock, is placed in a quantity of water)  | <b>Water</b><br>Investigation 2, Science Extension  | Page 27  |
| d. Classify types of materials (e.g., water, salt, sugar, iron filings, salt water) into substances (materials that have specific physical properties) or mixtures of substances by using their characteristic properties | <b>Water</b><br>Investigation 1, Part 1<br>Investigation 3, Parts 2-3<br><b>Earth Materials</b><br>Investigation 1, Parts 1-3<br>Investigation 2, Part 1<br>Investigation 3, Part 1<br>Science Stories<br><b>Magnetism and Electricity</b><br>Investigation 1, Part 1 | Pages 8-13<br>Pages 19-23<br>Pages 8-29<br>Pages 8-13<br>Pages 8-13<br>Pages 30-37<br>Pages 8-17 |

**Concept B:** Properties of mixtures depend upon the concentrations, properties, and interactions of particles

| Grade Level Expectation  | FOSS                                    | Page(s)     |
|--|---|-------------|
| <i>Scope and Sequence – Mixtures and Solutions/ Changes on the Earth's Surface</i> |   |             |
| a. Identify water as a solvent that dissolves materials (Do NOT assess the term    | <b>Water</b><br>Investigation 3, Part 3 | Pages 19-23 |

|  |   |   |
|--|---|---|
| solvent)   |   |   |
| b. Observe and describe how mixtures are made by combining solids or liquids, or a combination of these                      | <b>Earth Materials</b><br>Investigation 3, Part 1   | Pages 8-13  |
| c. Distinguish between the components in a mixture (e.g., trail mix, conglomerate rock, salad)                               | <b>Earth Materials</b><br>Investigation 1, Part 1-3   | Pages 8-29  |
| d. Describe ways to separate the components of a mixture by their properties (i.e., sorting, filtration, magnets, screening) | <b>Earth Materials</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 1, Part 1<br><b>Water</b><br>Investigation 3, Part 3 | Pages 16-29<br>Pages 14-19<br>Pages 8-17<br>Pages 19-23 |
| Note: These topics are addressed more fully in the grade five module <u>Mixtures and Solutions</u> .                         |   |   |

**Concept I: Mass is conserved during any physical or chemical change**

| Grade Level Expectation   | FOSS   | Page(s)               |
|---|--|-----------------------|
| <i>Scope and Sequence – Mixtures and Solutions</i>  |  |                       |
| a. Recognize that the total mass of a material remains constant whether it is together, in parts, or in a different state | <b>Water</b><br>Investigation 1, Part 1<br><b>Matter and Energy</b><br>Science Resources | Pages 8-13<br>Page 70 |

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence – Forms of Energy: Electrical Circuits</i>   |  |   |
| a. Construct and diagram a complete electric circuit by using a source (e.g., battery), means of transfer (e.g., wires), and receiver (e.g., resistance bulbs, motors, fans) | <b>Magnetism and Electricity</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-3   | Pages 8-19<br>Pages 10-26                       |
| b. Observe and describe the evidence of energy transfer in a closed series circuit (e.g., lit bulb, moving motor, fan)   | <b>Magnetism and Electricity</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-3<br>FOSS Web, Movie: How a Light Bulb Works<br><b>Matter and Energy</b><br>Investigation 1, Parts 1, 3 | Pages 8-19<br>Pages 10-26<br>Pages 50-62, 71-78 |
| c. Classify materials as conductors or insulators of electricity when placed   | <b>Magnetism and Electricity</b><br>Investigation 2, Parts 1-2   | Pages 20-25                                     |

|  |  |  |
|--|--|--|
| within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water) |  |  |
|--|--|--|

**Concept F: Energy can change from one form to another within systems, but the total amount remains the same**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i></p> <p>a. Identify the evidence of energy transformations (temperature change, light, sound, motion, and magnetic effects) that occur in electrical circuits</p> | <p><b>Magnetism and Electricity</b><br/>Investigation 2, Parts 1-2<br/>Investigation 3, Parts 1-3<br/>Investigation 4, Parts 1-3</p> | <p>Pages 8-19<br/>Pages 10-26<br/>Pages 8-22</p> |

## STRAND 2

### Properties and Principles of Force and Motion

**1. The motion of an object is described by its change in position relative to another object or point**

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

| Grade Level Expectation  | FOSS  | Page(s)                            |
|--|---|------------------------------------|
| <p><i>Scope and Sequence – Laws of Motion</i></p> <p>a. Classify different types of motion (straight line, curved, back and forth)</p> <p>b. Describe an object's motion in terms of distance and time</p> | <p><b>Human Body</b><br/>Investigation 2, Part 3<br/><b>Water</b><br/>Investigation 4, Part 2</p> <p>This topic is addressed in the grade five modules <u>Levers and Pulleys</u> and <u>Models and Designs</u>.</p> | <p>Pages 18-22<br/>Pages 14-18</p> |

**2. Forces affect motion**

**Concept A: Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude)**

| Grade Level Expectation   | FOSS  | Page(s) |
|---|---|---------|
| <p><i>Scope and Sequence – Laws of Motion</i></p> <p>a. Identify the forces acting on the motion of objects traveling in a straight line</p> <p>b. Recognize friction as a force that slows down or stops a moving object that is touching another object or surface</p> <p>c. Compare the forces (measured by a spring scale in Newtons) required to overcome friction when an object moves over different surfaces (i.e., rough/smooth)</p> | <p>This topic is addressed in the grade five modules <u>Variables</u> and <u>Models and Designs</u>.</p> <p>This topic is addressed in the grade five module <u>Models and Designs</u>.</p> |         |

**Concept B: Every object exerts a gravitational force on every other object**

| Grade Level Expectation  | FOSS   | Page(s) |
|--|--|---------|
| <p><i>Scope and Sequence – Laws of Motion</i></p> <p>a. Determine the gravitational pull of the Earth on an object (weight) using a spring scale</p> | <p>This topic is addressed in the grade five module <u>Levers and Pulleys</u>.</p> |         |

**Concept D: Newton’s Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

| Grade Level Expectation   | FOSS  | Page(s) |
|---|---|---------|
| <p><i>Scope and Sequence – Laws of Motion</i></p> <p>a. Recognize that balanced forces do not affect an object’s motion</p> <p>b. Describe how unbalanced forces acting on an object changes its speed (faster/slower), direction of motion, or both</p> <p>c. Explain how increasing or decreasing the amount of force on an object affects the motion of that object</p> <p>d. Explain how the mass of an object (e.g., cars, marbles, rocks, boulders) affects the force required to move it</p> <p>e. Predict how the change in speed of an object (i.e., faster/slower/remains the same) is affected by the amount of force applied to an object and the mass of the object</p> <p><i>Scope and Sequence – Forms of Energy: Electrical Circuits</i></p> <p>f. Predict the effects of an electrostatic force (static electricity) on the motion of objects (attract or repel)</p> | <p>This topic is addressed in the grade five modules <u>Levers and Pulleys</u> and <u>Models and Designs</u>.</p> <p>This topic is addressed in the grade five modules <u>Levers and Pulleys</u> and <u>Models and Designs</u>.</p> <p>This topic is addressed in the grade five modules <u>Variables</u> and <u>Models and Designs</u>.</p> <p>This topic is addressed in the grade five module <u>Levers and Pulleys</u>.</p> |         |

**STRAND 3**

**Characteristics and Interactions of Living Organisms**

Not assessed at this level

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

#### 1. Organisms are interdependent with one another and with their environment

**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify the ways a specific organism may interact with other organisms or with the environment (e.g., pollination, shelter, seed dispersal, camouflage, migration, hibernation, defensive mechanism)</p> <p>b. Recognize different environments (i.e., pond, forest, prairie) support the life of different types of plants and animals</p> | <p><b>Structures of Life</b><br/>Investigation 3, Part 3<br/>Science Stories</p><br><p><b>Structures of Life</b><br/>Science Stories</p> | <p>Pages 20-23<br/>Pages 1, 3, 22-36</p><br><p>Pages 22-34</p> |

**Concept D: The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes**

| Grade Level Expectation  | FOSS                   | Page(s) |
|--|------------------------|---------|
| <p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify examples in Missouri where human activity has had a beneficial or harmful effect on other organisms (e.g., feeding birds, littering vs. picking up trash, hunting/conservation of species, paving/restoring greenspace)</p> | <p>Local Objective</p> |         |

#### 2. Matter and energy flow through an ecosystem

**Concept A: As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use**

| Grade Level Expectation   | FOSS   | Page(s)        |
|---|--|----------------|
| <p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem</p> <p>b. Differentiate between the three types of consumers (herbivore, carnivore, omnivore)</p> | <p>This topic is addressed in the grade five module <u>Environments</u>.</p><br><p><b>Structures of Life</b><br/>Science Stories</p> | <p>Page 43</p> |

|  |  |             |
|--|--|-------------|
| c. Categorize organisms as predator or prey in a given ecosystem | <b>Structures of Life</b><br>Science Stories | Pages 23-24 |
|--|--|-------------|

**3. Genetic variation sorted by the natural selection process explains evidence of biological evolution**

**Concept A: Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record**

| Grade Level Expectation  | FOSS            | Page(s) |
|--|-----------------|---------|
| <p><i>Scope and Sequence – Changes in the Earth’s Surface</i></p> <p>a. Compare and contrast common fossils found in Missouri (i.e., trilobites, ferns, crinoids, gastropods, bivalves, fish, mastodons) to organisms present on Earth today</p> | Local Objective |         |

**Concept C: Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <p><i>Scope and Sequence – Interactions among Organisms and their Environment</i></p> <p>a. Identify specialized structures and describe how they help plants survive in their environment (e.g., root, cactus needles, thorns, winged seed, waxy leaves)</p> <p>b. Identify specialized structures and senses and describe how they help animals survive in their environment (e.g., antennae, body covering, teeth, beaks, whiskers, appendages)</p> <p>c. Recognize internal cues (e.g., hunger) and external cues (e.g., changes in the environment) that cause organisms to behave in certain ways (e.g., hunting, migration, hibernation)</p> <p>d. Predict which plant or animal will be able to survive in a specific environment based on its special structures or behaviors</p> | <p><b>Structures of Life</b><br/>Science Stories</p><br><p><b>Structures of Life</b><br/>Investigation 3, Part 1<br/>Investigation 4, Part 1<br/>Science Stories</p><br><p><b>Structures of Life</b><br/>Science Stories</p> | <p>Pages 1, 3, 25-29</p><br><p>Pages 8-15<br/>Pages 8-13<br/>Pages 17-18, 21, 23-24, 26-29, 31-32</p><br><p>Pages 24, 27-29, 31</p> |

**STRAND 5**  
**Processes and Interactions of the Earth's Systems**  
**(Geosphere, Atmosphere, and Hydrosphere)**

- c) Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <p><i>Scope and Sequence – Changes in the Earth's Surface</i></p> <p>a. Identify and describe the components of soil (e.g., plant roots and debris, bacteria, fungi, worms, types of rock) and its properties (e.g., odor, color, resistance to erosion, texture, fertility, relative grain size, absorption rate)</p> <p>b. Compare the physical properties (i.e., size, shape, color, texture, layering, presence of fossils) of rocks (mixtures of different Earth materials, each with observable physical properties)</p> | <p><b>Earth Materials</b><br/>           Investigation 1, Parts 1-3<br/>           Investigation 4, Part 1<br/>           Science Stories<br/>           FOSS Web, Rock Database</p> | <p>Pages 8-29<br/>           Pages 8-13<br/>           Pages 34-37</p> |

2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes

**Concept A: The Earth's materials and surface features are changed through a variety of external processes**

| Grade Level Expectation  | FOSS  | Page(s) |
|--|---|---------|
| <p><i>Scope and Sequence – Changes in the Earth's Surface</i></p> <p>a. Observe and describe the breakdown of plant and animal material into soil through decomposition processes (i.e., decay, rotting, composting, digestion)</p> <p>b. Identify the major landforms on Earth (i.e., mountains, plains, oceans, river valleys, coastlines, canyons)</p> <p>c. Describe how weathering agents (e.g., water, chemicals, temperature, wind, plants) cause surface changes that create and/or change Earth's surface materials</p> | <p>This topic is addressed in the grade fine module <u>Landforms</u></p> <p>This topic is addressed in the grade fine module <u>Landforms</u></p> |         |

|   |   |  |
|---|---|--|
| and/or landforms  |   |  |
| d. Describe how erosional processes (i.e., action of gravity, waves, wind, rivers, glaciers) cause surface changes that create and/or change Earth's surface materials and/or landforms | This topic is addressed in the grade fine module <u>Landforms</u> |  |

**3. Human activity is dependent upon and affects Earth's resources and systems**  
**Concept A: Earth's materials are limited natural resources affected by human activity**

| Grade Level Expectation  | FOSS  | Page(s) |
|--|---|---------|
| <i>Scope and Sequence – Changes in the Earth's Surface</i>   |   |         |
| a. Identify the ways humans affect the erosion and deposition of Earth's materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings) | This topic is addressed in the grade fine module <u>Landforms</u> |         |
| b. Propose ways to solve simple environmental problems (e.g., recycling, composting, ways to decrease soil erosion) that result from human activity                          |   |         |

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

Not assessed at this level

## STRAND 7

### Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**  
**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation                                       | FOSS  | Page(s)                                |
|---|---|--|
| <i>Scope and Sequence - All Units</i>                         |   |  |
| a. Formulate testable questions and explanations (hypotheses) | FOSS modules emphasize an inquiry approach. Students ask questions and seek answers. See for example:<br><b>Ideas and Invention</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-2<br><b>Earth Materials</b><br>Investigation 3, Parts 1<br><b>Water</b> | Pages 8-19<br>Pages 8-17<br>Pages 8-15 |

|  |   |               |
|--|---|---------------|
|  | Investigation 3, Parts 1-4<br><b>Physics of Sound</b>   | Pages 8-26    |
|  | Investigation 2, Parts 1-3<br><b>Sun, Moon and Stars</b>  | Pages 8-24    |
|  | Investigation 1, Parts 1-2<br><b>Matter and Energy</b>  | Pages 42-64   |
|  | Investigation 3, Part 2   | Pages 139-150 |
| b. Recognize the characteristics of a fair and unbiased test | FOSS' inquiry approach emphasizes scientific, "fair", testing   |               |
| c. Conduct a fair test to answer a question                  | FOSS modules emphasize an inquiry approach. Students ask questions and seek answers. See for example:<br><b>Ideas and Invention</b> |               |
|  | Investigation 2, Parts 1-2  | Pages 8-19    |
|  | Investigation 3, Parts 1-2  | Pages 8-19    |
|  | <b>Earth Materials</b>  |               |
|  | Investigation 3, Parts 1  | Pages 8-15    |
|  | <b>Water</b>  |               |
|  | Investigation 3, Parts 1-4  | Pages 8-26    |
|  | <b>Physics of Sound</b>   |               |
|  | Investigation 2, Parts 1-3  | Pages 8-24    |
|  | <b>Matter and Energy</b>  |               |
|  | Investigation 3, Part 2   | Pages 139-150 |

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation  | FOSS   | Page(s)       |
|--|--|---------------|
| <i>Scope and Sequence - All Units</i>  |  |               |
| a. Make qualitative observations using the five senses   | FOSS investigations emphasize student observation. See for example:<br><b>Physics of Sound</b> |               |
|  | Investigation 1, Parts 1-2   | Pages 8-20    |
|  | <b>Structures of Life</b>  |               |
|  | Investigation 1, Parts 1-2   | Pages 8-27    |
|  | <b>Earth Materials</b>   |               |
|  | Investigation 2, Parts 1-2   | Pages 8-21    |
|  | <b>Sun, Moon and Stars</b>   |               |
|  | Investigation 2, Parts 1-2   | Pages 79-100  |
|  | <b>Matter and Energy</b>   |               |
|  | Investigation 4, Part 2  | Pages 181-192 |
| b. Make observations using simple tools and equipment (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders) | <b>Measurement</b>   |               |
|  | Investigation 2, Parts 1-3   | Pages 8-24    |
|  | <b>Structures of Life</b>  |               |
|  | Investigation 2, Part 1  | Pages 8-13    |
|  | <b>Earth Materials</b>   |               |
|  | Investigation 1, Parts 1-3   | Pages 8-29    |
|  | <b>Matter and Energy</b>   |               |
|  | Investigation 3, Parts 2-3   | Pages 139-160 |
|  | Investigation 4, Part 1  | Pages 174-180 |
| c. Measure length to the nearest centimeter, mass using grams, temperature using degrees Celsius,  | <b>Measurement</b>   |               |
|  | Investigation 1, Parts 2-3   | Pages 16-24   |
|  | <b>Structures of Life</b>  |               |
|  | Investigation 2, Part 3  | Pages 18-22   |

|  |  |   |
|--|--|---|
| volume using liters  | <b>Human Body</b><br>Investigation 4, Part 1<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3<br>Investigation 4, Part 1  | Pages 8-16<br><br>Pages 139-160<br>Pages 174-180  |
| d. Compare amounts/measurements  | <b>Water</b><br>Investigation 3, Parts 1-3<br><b>Measurement</b><br>Investigation 2, Part 3<br>Investigation 3, Part 3<br><b>Magnetism and Electricity</b><br>Investigation 1, Part 3<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3<br>Investigation 4, Part 1 | Pages 8-20<br><br>Pages 18-24<br>Pages 18-21<br><br>Pages 23-29<br><br>Pages 139-160<br>Pages 174-180 |
| e. Judge whether measurements and computation of quantities are reasonable | <b>Measurement</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Parts 2-3<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3<br>Investigation 4, Part 1  | Pages 16-24<br>Pages 14-21<br><br>Pages 139-160<br>Pages 174-180                                      |

**Concept C: Evidence is used to formulate explanations**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>   | <b>Page(s)</b>  |
|--|---|---|
| <i>Scope and Sequence - All Units</i>  |   |   |
| a. Use quantitative and qualitative data as support for reasonable explanations                      | FOSS investigations emphasize the use of evidence to formulate explanations. See for example:<br><b>Human Body</b><br>Investigation 4, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 2<br><b>Physics of Sound</b><br>Investigation 2, Parts 1-3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 2, Part 2<br>Investigation 3, Part 2 | Pages 17-19<br><br>Pages 14-18<br><br>Pages 8-24<br><br>Pages 42-64<br><br>Pages 103-114<br>Pages 139-150 |
| b. Use data as support for observed patterns and relationships, and to make predictions to be tested | <b>Human Body</b><br>Investigation 4, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 2<br><b>Physics of Sound</b><br>Investigation 2, Parts 1-3<br><b>Sun, Moon and Stars</b><br>Investigation 1, Parts 1-2<br><b>Matter and Energy</b><br>Investigation 3, Part 2   | Pages 17-19<br><br>Pages 14-18<br><br>Pages 8-24<br><br>Pages 42-64<br><br>Pages 139-150                  |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Evaluate the reasonableness of an explanation</p> <p>b. Analyze whether evidence supports proposed explanations</p> | <p>FOSS investigations encourage evaluation of explanations. See for example:</p> <p><b>Magnetism and Electricity</b><br/>Investigation 4, Part 2</p> <p><b>Water</b><br/>Investigation 3, Parts 2-3</p> <p><b>Measurement</b><br/>Investigation 2, Part 3</p> <p><b>Sun, Moon and Stars</b><br/>Investigation 1, Parts 1-2</p> <p><b>Matter and Energy</b><br/>Investigation 2, Part 2</p> <p><b>Magnetism and Electricity</b><br/>Investigation 4, Part 2</p> <p><b>Water</b><br/>Investigation 3, Parts 2-3</p> <p><b>Measurement</b><br/>Investigation 2, Part 3</p> <p><b>Sun, Moon and Stars</b><br/>Investigation 1, Parts 1-2</p> <p><b>Matter and Energy</b><br/>Investigation 4, Part 2</p> | <p>Pages 14- 18</p> <p>Pages 12-20</p> <p>Pages 18-24</p> <p>Pages 42-64</p> <p>Pages 103-114</p> <p>Pages 14- 18</p> <p>Pages 12-20</p> <p>Pages 18-24</p> <p>Pages 42-64</p> <p>Pages 181-192</p> |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Communicate simple procedures and results of investigations and explanations through:<br/>oral presentations<br/>drawings and maps<br/>data tables, graphs<br/>(bar, single line, pictograph) writings</p> | <p>FOSS investigations emphasize student communication. See for example:</p> <p><b>Earth Materials</b><br/>Investigation 2, Parts 1-2</p> <p><b>Water</b><br/>Investigation 3, Parts 2-3</p> <p><b>Magnetism and Electricity</b><br/>Investigation 1, Part 3<br/>Investigation 4, Part 2</p> <p><b>Measurement</b><br/>Investigation 4, Parts 1-3</p> <p><b>Sun, Moon and Stars</b><br/>Investigation 2, Parts 1-2</p> <p><b>Matter and Energy</b><br/>Investigation 3, Parts 2-3</p> | <p>Pages 8-21</p> <p>Pages 12-20</p> <p>Pages 23-29<br/>Pages 14-18</p> <p>Pages 8-21</p> <p>Pages 89-100</p> <p>Pages 139-16</p> |

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A:** Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all

| Grade Level Expectation  | FOSS  | Page(s)                   |
|--|---|---------------------------|
| <i>Scope and Sequence – Forms of Energy: Electrical Circuits</i><br>a. Design and construct an electrical device, using materials and/or existing objects, that can be used to perform a task (Assess Locally) | <b>Magnetism and Electricity</b><br>Investigation 4, Part 3<br>Investigation 5, Parts 1-2 | Pages 19-22<br>Pages 8-21 |

**Concept B:** Advances in technology often result in improved data collection and an increase in scientific information

| Grade Level Expectation  | FOSS   | Page(s)                               |
|--|--|---------------------------------------|
| <i>Scope and Sequence – Mixtures and Solutions/Forms of Energy: Electrical Circuits</i><br>a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g., telescopes, magnifiers, balances, microscopes, computers, stethoscopes, thermometers) | <b>Measurement</b><br>Science Stories<br><b>Ideas and Inventions</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources | Pages 21-23<br>Page 38<br>Pages 40-43 |

**Concept C:** Technological solutions to problems often have drawbacks as well as benefits

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Forms of Energy: Electrical Circuits/Laws of Motion/Interactions among Organisms and Their Environments</i><br>a. Identify how the effects of inventions or technological advances (e.g., different types of light bulbs, semiconductors/integrated circuits and electronics, satellite imagery, robotics, communication, transportation, generation of energy, renewable materials) may be helpful, harmful, or both (Assess Locally) | <b>Magnetism and Electricity</b><br>Science Stories<br><b>Ideas and Inventions</b><br>Science Stories<br><b>Water</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources | Pages 16-19, 32-33<br>Pages 17-22<br>Pages 18-19<br>Pages 40-43 |

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>   | <b>Page(s)</b>   |
|--|---|--|
| <i>Scope and Sequence – All units</i>  |   |  |
| a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work contributed to science and technology (Assess Locally) | <b>Magnetism and Electricity</b><br>Science Stories<br><b>Ideas and Inventions</b><br>Science Stories<br><b>Structures of Life</b><br>Science Stories<br><b>Water</b><br>Science Stories<br><b>Sun, Moon and Stars</b><br>Science Resources | Pages 12-23, 34-37<br>Pages 17-21<br>Pages 6-9<br>Pages 24-26<br>Pages 40, 44-45 |

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>  | <b>Page(s)</b>   |
|--|--|--|
| <i>Scope and Sequence - All Units</i>  |  |  |
| a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning through discovery) | FOSS investigations provide the opportunity to identify questions/problems and to solve them. See for example:<br><b>Water</b><br>Investigation 4, Part 2<br><b>Ideas and Inventions</b><br>Investigation 2, Part 2<br>Investigation 3, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 3<br><b>Measurement</b><br>Investigation 3, Part 3<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3 | Pages 14-18<br>Pages 16-19<br>Pages 14-17<br>Pages 19-22<br>Pages 18-21<br>Pages 139-160 |
| b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)  | <b>Water</b><br>Investigation 4, Part 2<br><b>Ideas and Inventions</b><br>Investigation 2, Part 2<br>Investigation 3, Part 2<br><b>Magnetism and Electricity</b><br>Investigation 4, Part 3<br><b>Measurement</b><br>Investigation 3, Part 3<br><b>Matter and Energy</b><br>Investigation 3, Parts 2-3   | Pages 14-18<br>Pages 16-19<br>Pages 14-17<br>Pages 19-22<br>Pages 18-21<br>Pages 139-160 |

# GRADE FIVE

## STRAND 1

### Properties and Principles of Matter and Energy

**1. Changes in properties and states of matter provide evidence of the atomic theory of matter**

**Concept C: Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <i>Scope and Sequence – Water Cycle and Weather</i>   |  |   |
| a. Recognize how changes in state (i.e., freezing/melting, condensation/evaporation) provide evidence that matter is made of particles too small to be seen | <b>Solar Energy</b><br>Science Stories<br><b>Water Planet</b><br>Investigation 2, Parts 1-4<br>Science Resources | Pages 2, 19<br><br>Pages 80-110<br>Pages 26-30, 33-37 |

**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence – Water cycle and Weather</i>   |   |  |
| a. Classify matter as a solid, a liquid, or a gas, as it exists at room temperature, using physical properties (i.e., volume, shape, ability to flow)                         | <b>Mixtures and Solutions</b><br>Investigation 1, Part 1<br>Investigation 4, Parts 1-2<br>Science Stories | Pages 8-15<br>Pages 8-19<br>Pages 11-13, 18-22 |
| b. Predict the effect of heat energy on the physical properties of water as it changes to and from a solid, liquid, or gas (i.e., freezing/melting, evaporation/condensation) | <b>Solar Energy</b><br>Science Stories  | Pages 23-24                                    |

**Concept I: Mass is conserved during any physical or chemical change**

| Grade Level Expectation  | FOSS | Page(s) |
|--|------|---------|
| <i>Scope and Sequence – Water Cycle and Weather</i>  |      |         |
| a. Recognize the mass of water remains constant as it changes state (as evidenced in a closed container) |      |         |

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

| Grade Level Expectation  | FOSS  | Page(s) |
|--|---|---------|
| <i>Scope and Sequence – Solar System</i>   |   |         |
| a. Recognize light can be transferred from the source to the receiver (eye) through space in | This topic is address in the grade 4 module <u>Ideas and Inventions</u> |         |

|  |   |  |
|--|---|--|
| straight lines   |   |  |
| b. Recognize how an object (e.g., moon, mirror, objects in a room) can only be seen when light is reflected from that object to the receiver (eye) | This topic is address in the grade 4 module <u>Ideas and Inventions</u> |  |

**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence – Water Cycle and Weather</i>                                  |  |  |
| a. Recognize the Sun as the primary source of energy for temperature change on Earth | <b>Solar Energy</b><br>Investigation 2, Parts 1-2<br>Science Stories<br>FOSS Web, Activity: Solar Road Race<br><b>Water Planet</b><br>Investigation 3, Part 1<br>Science Resources | Pages 8-24<br>Pages 1-4, 22-23<br><br>Pages 125-135<br>Pages 42-45 |

## STRAND 2

### Properties and Principles of Force and Motion

#### 2. Forces affect motion

**Concept A: Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude**

| Grade Level Expectation   | FOSS  | Page(s)                   |
|---|---|---------------------------|
| <i>Scope and Sequence – Work and Simple Machines</i>  |   |                           |
| a. Identify the forces acting on a load and use a spring scale to measure the weight (resistance force) of the load | <b>Levers and Pulleys</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Parts 1-2 | Pages 18-28<br>Pages 8-20 |

**Concept D: Newton’s Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

| Grade Level Expectation   | FOSS | Page(s) |
|---|------|---------|
| <i>Scope and Sequence – Work and Simple Machines</i>  |      |         |
| a. Describe how friction affects the amount of force needed to do work over different surfaces or through different media |      |         |

**Concept F: Simple machines (levers, inclined planes, wheel and axle, pulleys) affect the force applied to an object and/or direction of movement as work is done**

| Grade Level Expectation   | FOSS | Page(s) |
|---|------|---------|
| <i>Scope and Sequence – Work and Simple Machines</i>  |      |         |
| a. Explain how work can be done on an object (force applied and distance moved) (No formula calculations at this level) |      |         |

|   |  |  |
|---|--|--|
| b. Recognize simple machines change the amount of effort force and/or direction of force  | <b>Levers and Pulleys</b><br>Investigation 1, Parts 2-3<br>Investigation 2, Parts 2-4<br>Investigation 3, Parts 1-2<br>Investigation 4, Parts 1-2<br>Science Stories | Pages 18-28<br>Pages 14-25<br>Pages 8-20<br>Pages 8-20<br>Pages 1-27 |
| c. Compare the measures of effort force (measured using a spring scale to the nearest Newton) needed to lift a load with and without the use of simple machines | <b>Levers and Pulleys</b><br>Investigation 3, Parts 1-2  | Pages 8-20   |
| d. Identify the simple machines in common tools and household items   | <b>Levers and Pulleys</b><br>Investigation 2, Parts 2-4<br>Investigation 4, Language Extension<br>Science Stories  | Pages 14-25<br>Page 26<br>Pages 1-27                                 |

### STRAND 3

#### Characteristics and Interactions of Living Organisms

##### 1. There is a fundamental unity underlying the diversity of all living organisms

##### **Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

| Grade Level Expectation   | FOSS | Page(s) |
|---|------|---------|
| <i>Scope and Sequence –<br/>Classification of Plants and<br/>Animals</i>  |      |         |
| a. Compare structures (e.g., wings vs. fins vs. legs; gills vs. lungs; feathers vs. hair vs. scales) that serve similar functions for animals belonging to different vertebrate classes |      |         |

##### **Concept E: Biological classifications are based on how organisms are related**

| Grade Level Expectation   | FOSS  | Page(s)                     |
|---|---|-----------------------------|
| <i>Scope and Sequence –<br/>Classification of Plants and<br/>Animals</i>  |   |                             |
| a. Explain how similarities are the basis for classification  | <b>Living Systems</b><br>Investigation 2, Part 2<br>Science Resources                 | Pages 99-106<br>Pages 21-22 |
| b. Distinguish between plants (which use sunlight to make their own food) and animals (which must consume energy-rich food) | <b>Environment</b><br>Science Stories<br><b>Food and Nutrition</b><br>Science Stories | Pages 39-41<br>Pages 42-43  |
| c. Classify animals as vertebrates or invertebrates   |   |                             |

|   |  |  |
|---|--|--|
| <p>d. Classify vertebrate animals into classes (amphibians, birds, reptiles, mammals, fish) based on their characteristics</p> <p>e. Identify plants or animals using simple dichotomous keys</p> |  |  |
|---|--|--|

**2. Living organisms carry out life processes in order to survive**

**Concept C: Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <p><i>Scope and Sequence – Classification of Plants and Animals</i></p> <p>a. Recognize the major life processes carried out by the major systems of plants and animals (e.g., support, reproductive, digestive, transport/circulatory, excretory, response) Do NOT assess naming of organs within each system or explanation of the processes carried out by those systems</p> | <p><b>Food and Nutrition</b><br/>Science Stories</p> <p><b>Living Systems</b><br/>Investigation 1, Parts 1-3<br/>Science Resources</p> | <p>Pages 6-8, 44-50</p> <p>Pages 51-70<br/>Pages 2-13</p> |

**STRAND 4**

**Changes in Ecosystems and Interactions of Organisms with their Environments**

Not assessed at this level

**STRAND 5**

**Processes and Interactions of the Earth’s Systems (Geosphere, Atmosphere, and Hydrosphere)**

**1. Earth’s systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept B: The hydrosphere is composed of water (a material with unique properties) and other materials**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <p><i>Scope and Sequence – Water Cycle and Weather</i></p> <p>a. Classify major bodies of surface water (e.g., rivers, lakes, oceans, glaciers) as fresh or salt water, flowing or stationary, large or small, solid or liquid, surface or groundwater</p> <p>b. Relate the type of water body to the process by which it was formed</p> | <p><b>Landforms</b><br/>Science Stories<br/>This Topic is addressed in grade 6 module <u>Weather and Water</u></p> <p><b>Water Planet</b><br/>Investigation 4, Part 4<br/>Science Resources</p> <p><b>Landforms</b></p> | <p>Pages 15-21</p> <p>Pages 212-216<br/>Pages 63-66</p> <p>Pages 15-17</p> |

|  |                 |  |
|--|-----------------|--|
|  | Science Stories |  |
|--|-----------------|--|

**Concept C: The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles**

| Grade Level Expectation  | FOSS   | Page(s)                        |
|--|--|--------------------------------|
| <i>Scope and Sequence – Water Cycle and Weather</i>  |  |                                |
| a. Recognize the atmosphere is composed of a mixture of gases, water, and minute particles | <b>Mixtures and Solutions</b><br>Science Stories<br><b>Solar Energy</b><br>Science Stories<br>This topic is addressed in grade 6 module <u>Weather and Water</u> | Pages 20-22<br><br>Pages 22-24 |

**2. Earth’s Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept E: Changes in the form of water as it moves through Earth’s systems are described as the water cycle**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Water Cycle and Weather</i>   |   |   |
| a. Describe and trace the path of water as it cycles through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface runoff/ groundwater flow) | <b>Solar Energy</b><br>Science Stories<br>This topic is addressed in grade 6 module <u>Weather and Water</u><br><b>Water Planet</b><br>Investigation 4, Part 1<br>Science Resources | Pages 23-24<br><br>Pages 184-197<br>Pages 67-70 |
| b. Identify the different forms water can take (e.g., snow, rain, sleet, fog, clouds, dew) as it moves through the water cycle  | <b>Solar Energy</b><br>Science Stories<br>This topic is addressed in grade 6 module <u>Weather and Water</u>  | Pages 23-24                                     |

**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

| Grade Level Expectation   | FOSS   | Page(s) |
|---|--|---------|
| <i>Scope and Sequence – Water Cycle and Weather</i>   |  |         |
| a. Identify and use appropriate tools (i.e., thermometer, anemometer, wind vane, hygrometer, barometer, rain gauge, satellite images, weather maps) to collect weather data (i.e., temperature, wind speed and direction, relative humidity, air pressure, precipitation, cloud type and cover) | This topic is addressed in grade 6 module <u>Weather and Water</u> |         |
| b. Recognize and summarize relationships between weather data (e.g.,  | This topic is addressed in grade 6 module <u>Weather and Water</u> |         |

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| temperature and time of day, cloud cover and temperature, wind direction and temperature) collected over a period of time |  |  |
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**3. Human activity is dependent upon and affects Earth’s resources and systems**

**Concept A: Earth’s materials are limited natural resources affected by human activity**

| Grade Level Expectation  | FOSS   | Page(s)     |
|--|--|-------------|
| <i>Scope and Sequence – Water Cycle and Weather</i>  |  |             |
| a. Explain how major bodies of water are important natural resources for human activity (e.g., food, recreation, habitat, irrigation, solvent, transportation)                                     | <b>Water Planet</b><br>Science Resources<br><br>This topic is addressed in grade 6 module <u>Weather and Water</u> | Pages 63-66 |
| b. Describe how human needs and activities (e.g., irrigation, damming of rivers, waste treatment, sources of drinking water) have affected the quantity and quality of major bodies of fresh water | <b>Water Planet</b><br>Science Resources   | Pages 65-66 |
| c. Propose solutions to problems related to water quality and availability that result from human activity   | <b>Water Planet</b><br>Science Resources   | Page 66     |

**STRAND 6**

**Composition and Structure of the Universe and the Motion of the Objects Within It**

**1. The universe has observable properties and structure**

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Solar System</i>   |   |  |
| a. Recognize the Earth is one of several planets within a solar system that orbits the Sun | <b>Solar Energy</b><br>Science Stories<br><b>Models and Designs</b><br>Science Stories<br><b>Water Planet</b><br>Investigation 1, Part 1<br>Science Resources | Pages 41-43<br><br>Page 7<br><br>Pages 50-58<br>Pages 1-13 |
| b. Recognize the moon orbits the Earth   | <b>Water Planet</b><br>Science Resources<br><br>This topic is addressed in the grade 6 module <u>Planetary Science</u>  | Page 6   |
| c. Recognize planets look  | This topic is addressed in the  |  |

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| like stars and appear to move across the sky among the stars | grade 6 module <u>Planetary Science</u> |  |
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**Concept B: The Earth has a composition and location suitable to sustain life**

| Grade Level Expectation  | FOSS   | Page(s)               |
|--|--|-----------------------|
| <i>Scope and Sequence – Solar System</i><br>a. Describe physical features of the planet Earth that allows life to exist (e.g., air, water, temperature) and compare these to the physical features of the Sun, the moon, and other planets | <b>Solar Energy</b><br>Science Stories<br><b>Water Planet</b><br>Science Resources<br>This topic is addressed in the grade 6 module <u>Planetary Science</u> | Page 42<br><br>Page 6 |

**2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces**

**Concept B: The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns**

| Grade Level Expectation  | FOSS   | Page(s) |
|--|--|---------|
| <i>Scope and Sequence – Solar System</i><br>a. Sequence images of the lit portion of the moon seen from Earth as it cycles day-to-day in about a month in order of occurrence (Do NOT assess cause of moon phases) | This topic is addressed in the grade 6 module <u>Planetary Science</u> |         |

**Concept C: The regular and predictable motions of the Earth and moon relative to the Sun explain natural phenomena on Earth, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

| Grade Level Expectation   | FOSS   | Page(s)                 |
|---|--|-------------------------|
| <i>Scope and Sequence – Solar System</i><br>a. Recognize the Earth rotates once every 24 hours<br><br>b. Relate changes in the length and position of a shadow to the time of day and apparent position of the Sun in the sky, as determined by Earth's rotation<br><br>c. Relate the apparent motion of the Sun, moon, and stars in the sky to the rotation of the Earth (Do not assess apparent motion of polar constellations) | This topic is addressed in the grade 6 module <u>Planetary Science</u><br><br><b>Solar Energy</b><br>Investigation 1, Parts 1-2<br>Science Stories<br><br>This topic is addressed in the grade 6 module <u>Planetary Science</u> | Pages 8-21<br>Pages 8-9 |

## STRAND 7

### Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking  
**Concept A:** Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence - All Units</i>  |  |   |
| a. Formulate testable questions and explanations (hypotheses)                | FOSS modules emphasize an inquiry approach. Students ask questions and seek answers. See for example:<br><b>Variables</b><br>Investigation 3, Part 2<br><b>Environment</b><br>Investigation 2, Parts 2-4<br><b>Solar Energy</b><br>Investigation 3, Parts 1-2<br><b>Water Planet</b><br>Investigation 2, Parts 2-3<br><b>Living Systems</b><br>Investigation 3, Part 3 | Pages 14-19<br><br>Pages 16-30<br><br>Pages 8-13<br><br>Pages 86-100<br><br>Pages 136-141 |
| 4. Recognize the characteristics of a fair and unbiased test                 | <b>Variables</b><br>Investigation 3, Part 2<br>Science Stories<br><b>Environment</b><br>Investigation 2, Parts 1-4<br><b>Water Planet</b><br>Investigation 3, Part 1   | Pages 14-19<br>Pages 1-3<br><br>Pages 1-30<br><br>Pages 125-135                           |
| 5. Conduct a fair test to answer a question                                  | <b>Variables</b><br>Investigation 1, Part 2<br><b>Environment</b><br>Investigation 2, Parts 2-4<br><b>Variables</b><br>Investigation 3, Part 2<br><b>Environment</b><br>Investigation 2, Parts 2-4<br>Investigation 3, Parts 1-2<br><b>Water Planet</b><br>Investigation 3, Part 1   | Page 16-22<br><br>Pages 16-30<br><br>Pages 8-13<br><br>Pages 125-135                      |
| 6. Make suggestions for reasonable improvements or extensions of a fair test | FOSS provides the opportunity to teach this expectation. See examples above.   |   |

**Concept B:** Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations

| Grade Level Expectation                                | FOSS   | Page(s)    |
|--|--|------------|
| <i>Scope and Sequence - All Units</i>                  |  |            |
| a. Make qualitative observations using the five senses | FOSS investigations emphasize student observation. See for example:<br><b>Mixtures and Solutions</b><br>Investigation 4, Parts 1-2 | Pages 8-19 |

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|--|--|---|
|  | <b>Food and Nutrition</b><br>Investigation 1, Part 2<br><b>Models and Designs</b><br>Investigation 1, Parts 1-2<br>Investigation 2, Parts 1-2<br><b>Water Planet</b><br>Investigation 2, Parts 2-3<br><b>Living Systems</b><br>Investigation 3, Part 3   | Pages 16-20<br><br>Pages 8-21<br>Pages 8-21<br><br>Pages 86-100<br><br>Pages 136-141  |
| b. Determine the appropriate tools and techniques to collect data  | <b>Models and Designs</b><br>Investigation 2, Parts 1-2<br><b>Variables</b><br>Investigation 3, Part 3<br><b>Landforms</b><br>Investigation 3, Part 3<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Living Systems</b><br>Investigation 3, Parts 2-3   | Pages 8-21<br><br>Pages 20-23<br><br>Pages 20-24<br><br>Pages 125-135<br><br>Pages 126-141  |
| c. Use a variety of tools and equipment to gather data (e.g., hand lenses, magnets, thermometers, metric rulers, balances, graduated cylinders, spring scales)                   | <b>Food and Nutrition</b><br>Investigation 2, Parts 2-3<br><b>Levers and Pulleys</b><br>Investigation 1, Parts 2-3<br><b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Living Systems</b><br>Investigation 3, Parts 2-3  | Pages 18-25<br><br>Pages 18-28<br><br>Pages 16-20<br><br>Pages 125-135<br><br>Pages 126-141   |
| d. Measure length to the nearest centimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, weight to the nearest Newton | <b>Variables</b><br>Investigation 3, Part 2-3<br><b>Models and Designs</b><br>Investigation 3, Parts 2-3<br><b>Levers and Pulleys</b><br>Investigation 4, Parts 1-2<br><b>Food and Nutrition</b><br>Investigation 2, Parts 1-3<br><b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Solar Energy</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-3<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Living Systems</b><br>Investigation 3, Parts 2-3 | Pages 14-23<br><br>Pages 13-23<br><br>Pages 8-20<br><br>Pages 8-25<br><br>Pages 16-20<br><br>Pages 8-24<br>Pages 8-23<br><br>Pages 125-135<br><br>Pages 126-141 |
| e. Compare amounts/measurements  | <b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Solar Energy</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-2<br><b>Environment</b><br>Investigation 6, Part 2<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Living Systems</b>  | Pages 16-20<br><br>Pages 8-24<br>Pages 8-23<br><br>Pages 14-17<br><br>Pages 125-135   |

|  |                               |               |
|--|-------------------------------|---------------|
| f. Judge whether measurements and computation of quantities are reasonable | Investigation 3, Parts 2-3    | Pages 126-141 |
|  | <b>Mixtures and Solutions</b> |               |
|  | Investigation 1, Part 2       | Pages 16-20   |
|  | <b>Levers and Pulleys</b>     |               |
|  | Investigation 4, Parts 1-2    | Pages 8-20    |
|  | <b>Solar Energy</b>           |               |
| Investigation 3, Parts 1-2   | Pages 8-23                    |               |
| <b>Water Planet</b>  |                               |               |
| Investigation 3, Part 1  | Pages 125-135                 |               |
| <b>Living Systems</b>  |                               |               |
| Investigation 3, Parts 2-3   | Pages 126-141                 |               |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence - All Units</i>  |  |  |
| a. Use quantitative and qualitative data as support for reasonable explanations                      | FOSS investigations emphasize the use of evidence to formulate explanations. See for example:<br><b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Solar Energy</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-2<br><b>Variables</b><br>Investigation 3, Parts 2-3<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Living Systems</b><br>Investigation 2, Part 1 | Pages 16-20<br>Pages 8-24<br>Pages 8-23<br>Pages 14-23<br>Pages 125-135<br>Pages 85-98 |
| b. Use data as support for observed patterns and relationships, and to make predictions to be tested | <b>Solar Energy</b><br>Investigation 2, Parts 1-2<br><b>Variables</b><br>Investigation 1, Parts 1-3<br><b>Environment</b><br>Investigation 6, Part 2<br><b>Water Planet</b><br>Investigation 3, Part 1   | Pages 8-24<br>Pages 8-27<br>Pages 14-17<br>Pages 125-135                               |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation                          | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence - All Units</i>            |  |  |
| a. Evaluate the reasonableness of an explanation | FOSS investigations provide the opportunity to evaluate explanations. See for example:<br><b>Variables</b><br>Investigation 1, Part 2<br><b>Environment</b><br>Investigation 5, Parts 2-3<br><b>Levers and Pulleys</b><br>Investigation 4, Part 2<br><b>Water Planet</b><br>Investigation 2, Parts 1-3<br><b>Living Systems</b><br>Investigation 2, Part 1 | Pages 16-22<br>Pages 14-22<br>Pages 14-20<br>Pages 80-100<br>Pages 85-98 |

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|---|---|--|
| b. Analyze whether evidence and scientific principles support proposed explanations | <b>Variables</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Parts 2-3<br><b>Levers and Pulleys</b><br>Investigation 4, Part 2<br><b>Water Planet</b><br>Investigation 2, Parts 1-3<br><b>Living Systems</b><br>Investigation 2, Part 1 | Pages 16-27<br>Pages 14-23<br><br>Pages 14-20<br><br>Pages 80-100<br><br>Pages 85-98 |
|---|---|--|

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| FOSS  | Grade Level Expectation  | Page(s)   |
|---|--|---|
| <i>Scope and Sequence - All Units</i>   |  |   |
| a. Communicate simple procedures and results of investigations and explanations through:<br>oral presentations<br>drawings and maps<br>data tables<br>graphs (bar, single line, pictograph)<br>writings | <b>Land Forms</b><br>Investigation 1, Parts 1-3<br>Investigation 3, Parts 1-3<br><b>Models and Design</b><br>Investigation 4, Part 2<br><b>Environments</b><br>Investigation 1, Parts 1-2<br><b>Solar Energy</b><br>Investigation 3, Parts 1-2<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Living Systems</b><br>Investigation 2, Part 1 | <br>Pages 8-24<br>Pages 8-24<br><br>Pages 11-15<br><br>Pages 8-19<br><br>Pages 8-23<br><br>Pages 125-135<br><br>Pages 85-96 |

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| Grade Level Expectation   | FOSS   | Page(s)                           |
|---|--|-----------------------------------|
| <i>Scope and Sequence – Work and Simple Machines</i>  |  |                                   |
| a. Design and construct a machine, using materials and/or existing objects, that can be used to perform a task (Assess Locally) | <b>Models and Designs</b><br>Investigation 2, Parts 1-2<br><b>Variables</b><br>Investigation 3, Part 3 | <br>Pages 8-21<br><br>Pages 20-23 |

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation  | FOSS  | Page(s)                                 |
|--|---|---|
| <i>Scope and Sequence – Work and Simple Machines/Water Cycle and Weather/Solar System/Classification of Plants and Animals</i> |   |   |
| a. Describe how new technologies have helped scientists make better observations and measurements for investigations (e.g.,    | <b>Solar Energy</b><br>Science Stories<br><b>Models and Designs</b><br>Science Stories<br><b>Variables</b><br>Science Stories | <br>Page 15<br><br>Page 9<br><br>Page 3 |

|  |  |             |
|--|--|-------------|
| telescopes, electronic balances, electronic microscopes, x-ray technology, computers, ultrasounds, computer probes such as thermometers) | <b>Mixtures and Solutions</b><br>Science Stories | Pages 26-27 |
|--|--|-------------|

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <p><i>Scope and Sequence – Simple Machines/Water Cycle and Weather/Solar System/Classification of Plants and Animals</i></p> <p>a. Identify how the effects of inventions or technological advances (e.g., complex machinery, technologies used in space exploration, satellite imagery, weather observation and prediction, communication, transportation, robotics, tracking devices) may be helpful, harmful, or both (Assess Locally)</p> | <p><b>Models and Designs</b><br/>Science Stories</p> <p><b>Solar Energy</b><br/>Science Stories</p> <p><b>Water Planet</b><br/>Science Resources</p> | <p>Pages 29-36</p> <p>Pages 29-33, 35-39</p> <p>Pages 18-19, 91-83</p> |

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <p><i>Scope and Sequence – All units</i></p> <p>a. Research biographical information about various scientists and inventors from different gender and ethnic backgrounds, and describe how their work contributed to science and technology (Assess Locally)</p> | <p><b>Variables</b><br/>Science Stories</p> <p><b>Mixtures and Solutions</b><br/>Science Stories</p> <p><b>Models and Designs</b><br/>Science Stories</p> <p><b>Food and Nutrition</b><br/>Science Stories</p> <p><b>Water Planet</b><br/>Science Resources</p> | <p>Pages 4-6</p> <p>Pages 9-10, 33-35</p> <p>Pages 4, 10, 25-30</p> <p>Pages 24-25</p> <p>Pages 15, 18-19</p> |

**3. Science and technology affect, and are affected by, society**

**Concept A: People, alone or in groups, are always making discoveries about nature and inventing new ways to solve problems and get work done**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Identify a question that was asked, or could be asked, or a problem that needed to be solved when given a brief scenario (fiction or nonfiction of people working alone or in groups solving everyday problems or learning</p> | <p><b>Models and Designs</b><br/>Investigation 2, Parts 1-2<br/>Investigation 3, Parts 1-2</p> <p><b>Variables</b><br/>Investigation 2, Part 1</p> <p><b>Environment</b><br/>Investigation 2, Part 4</p> <p><b>Water Planet</b><br/>Investigation 3, Part 1</p> | <p>Pages 8-21<br/>Pages 8-19</p> <p>Pages 8-13</p> <p>Pages 26-30</p> <p>Pages 125-135</p> |

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|--|---|--|
| <p>through discovery)</p> <p>b. Work with a group to solve a problem, giving due credit to the ideas and contributions of each group member (Assess Locally)</p> | <p><b>Living Systems</b><br/>Investigation 3, Part 3</p> <p><b>Models and Designs</b><br/>Investigation 2, Parts 1-2<br/>Investigation 3, Parts 1-2</p> <p><b>Variables</b><br/>Investigation 2, Part 1</p> <p><b>Environment</b><br/>Investigation 2, Part 4</p> <p><b>Water Planet</b><br/>Investigation 3, Part 1</p> <p><b>Living Systems</b><br/>Investigation 3, Part 3</p> | <p>Pages 136-141</p> <p>Pages 8-21<br/>Pages 8-19</p> <p>Pages 8-13</p> <p>Pages 26-30</p> <p>Pages 125-135</p> <p>Pages 136-141</p> |
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# GRADE SIX

## STRAND 1

### Properties and Principles of Matter and Energy

1. Changes in properties and states of matter provide evidence of the atomic theory of matter

**Concept A:** Objects, and the materials they are made of, have properties that can be used to describe and classify them

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <i>Scope and Sequence – Properties of and Changes in Matter</i>   | <b>Environments</b><br>Resources   | Page 39   |
| a. Recognize matter is anything that has mass and volume  | <b>Chemical Interactions</b><br>Investigation 3, Parts 1-3<br><b>Planetary Science</b><br>Investigation 8, Parts 3-4<br><b>Weather and Water</b><br>Investigation 5, Part 1  | Pages 92-113<br>Pages 260-270<br>Pages 152-162  |
| b. Describe and compare the volumes (the amount of space an object occupies) of objects or substances directly, using a graduated cylinder, and/or indirectly, using displacement methods | <b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Living Systems</b><br>Investigation 3, Parts 2-3<br><b>Chemical Interactions</b><br>Investigation 3, Part 1<br>Investigation 5, Part 1<br><b>Diversity of Life</b><br>Investigation 6, Part 1<br><b>Planetary Science</b><br>Investigation 8, Parts 3-4<br><b>Weather and Water</b><br>Investigation 5, Part 1                            | Pages 16-20<br>Pages 126-141<br>Pages 92-98<br>Pages 153-158<br>Pages 186-192<br>Pages 260-270<br>Pages 152-162               |
| c. Describe and compare the masses (amounts of matter) of objects to the nearest gram using a balance   | <b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br>Investigation 2, Parts 1-3<br><b>Living Systems</b><br>Investigation 2, Part 1<br>Investigation 3, Part 3<br><b>Chemical Interactions</b><br>Investigation 5, Part 1<br><b>Diversity of Life</b><br>Investigation 6, Part 1<br><b>Planetary Science</b><br>Investigation 8, Parts 3-4<br><b>Weather and Water</b><br>Investigation 5, Part 1 | Pages 10-20<br>Pages 8-25<br>Pages 85-98<br>Pages 136-141<br>Pages 153-158<br>Pages 186-192<br>Pages 260-270<br>Pages 152-162 |
| d. Classify the types of matter in an object into pure substances or mixtures using their specific physical properties  | <b>Mixtures and Solutions</b><br>Investigation 1, Parts 1-4<br><b>Chemical Interactions</b><br>Investigation 1, Parts 1-2<br>Investigation 8, Parts 1-3  | Pages 8-29<br>Pages 41-58<br>Pages 248-268  |

**Concept B: Properties of mixtures depend upon the concentrations, properties, and interactions of particles**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <p><i>Scope and Sequence – Properties of and Changes in Matter</i></p> <p>a. Describe the properties of each component in a mixture/solution and their distinguishing properties (e.g., salt water, oil and vinegar, pond water, Kool-Aid)</p> <p>b. Describe appropriate ways to separate the components of different types of mixtures (sorting, evaporation, filtration, magnets, boiling, chromatography, screening)</p> <p>c. Predict how various solids (soluble/insoluble) behave (e.g., dissolve, settle, float) when mixed with water</p> | <p><b>Mixtures and Solutions</b><br/>Investigation 1, Parts 1-4<br/>Investigation 2, Parts 1-4</p> <p><b>Chemical Interactions</b><br/>Investigation 1, Parts 1-2</p> <p><b>Mixtures and Solutions</b><br/>Investigation 1, Parts 2, 4<br/>Science Stories</p> <p><b>Chemical Interactions</b><br/>Investigation 8, Part 1</p> <p><b>Mixtures and Solutions</b><br/>Investigation 1, Part 1<br/>Investigation 2, Parts 1-2<br/>Investigation 3, Parts 1-2</p> <p><b>Chemical Interactions</b><br/>Investigation 1, Parts 1-2<br/>Investigation 8, Parts 1-2</p> | <p>Pages 8-29<br/>Pages 8-28</p> <p>Pages 41-58</p> <p>Pages 16-20, 25-29<br/>Page 3</p> <p>Pages 248-255</p> <p>Pages 5-15<br/>Pages 8-20<br/>Pages 8-20</p> <p>Pages 41-58<br/>Pages 248-262</p> |

**Concept C: Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence – Properties of and Changes in Matter</i></p> <p>a. Recognize evidence (e.g., diffusion of food coloring in water, light reflecting off of dust particles in the air, condensation of water vapor by increased pressure or decreased temperature) that supports the theory that matter is composed of small particles (atoms, molecules) that are in constant, random motion</p> | <p><b>Mixtures and Solutions</b><br/>Investigation 1, Parts 2-3<br/>Investigation 2, Parts 1-2<br/>Investigation 3, Part 1</p> <p><b>Water Planet</b><br/>Investigation 2, Parts 1-4<br/>Investigation 3, Parts 2-3<br/>Science Resources</p> <p><b>Chemical Interactions</b><br/>Investigation 3, Parts 1-3<br/>Resources</p> <p><b>Weather and Water</b><br/>Investigation 6, Part 1<br/>Investigation 5, Parts 2-3<br/>Resources<br/>CD, Matter Energy: Molecules in Solids, Liquids and Gases</p> | <p>Pages 16-24<br/>Pages 8-20<br/>Pages 8-14</p> <p>Pages 80-110<br/>Pages 136-157<br/>Pages 26-30, 33-34<br/>Pages 92-113<br/>Pages 16-27</p> <p>Pages 190-193<br/>Pages 163-174<br/>Pages 22-31</p> |

**Concept D: Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification**

| Grade Level Expectation  | FOSS  | Page(s)              |
|--|---|----------------------|
| <p><i>Scope and Sequence – Earth's Resources</i></p> <p>a. Describe the relationship between the change in the</p> | <p><b>Chemical Interactions</b><br/>Investigation 4, Part 2</p> | <p>Pages 130-138</p> |

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|--|-----------|-------------|
| volume of water and changes in temperature as it relates to the properties of water (i.e., water expands and becomes less dense when frozen) | Resources | Pages 42-48 |
|--|-----------|-------------|

**Concept G: Properties of objects and states of matter can change chemically and/or physically**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence – Properties of and Changes in Matter</i>   |   |  |
| a. Recognize and classify changes in matter as chemical and/or physical   | <b>Mixtures and Solutions</b><br>Investigation 1, Parts 1-3<br>Investigation 4, Parts 1-3<br>FOSS Web, Movie: Physical and Chemical Change<br><b>Chemical Interactions</b><br>Investigation 7, Parts 1-5<br>Investigation 9, Parts 1-3<br>Resources   | Pages 8-20<br>Pages 8-24<br><br>Pages 204-234<br>Pages 280-307<br>Pages 3, 16-27, 63-68  |
| b. Identify chemical changes (i.e., rusting, oxidation, burning, decomposition by acids, decaying, baking) in common objects (i.e., rocks such as limestone, minerals, wood, steel wool, plants) as a result of interactions with sources of energy or other matter that form new substances with different characteristic properties | <b>Mixtures and Solutions</b><br>Investigation 4, Parts 1-3<br>Science Stories<br><b>Foods and Nutrition</b><br>Investigation 2, Parts 1-3<br><b>Earth History</b><br>Investigation 5, Parts 1-2<br><b>Chemical Interactions</b><br>Investigation 10, Parts 1-2<br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1  | Pages 8-24<br>Pages 23-24<br><br>Pages 8-24<br><br>Pages 175-182<br><br>Pages 323-336<br>Pages 63-68<br><br>Pages 142-150  |
| c. Identify physical changes in common objects (e.g., rocks, minerals, wood, water, steel wool, plants) and describe the processes which caused the change (e.g., weathering, erosion, cutting, dissolving)   | <b>Mixtures and Solutions</b><br>Investigation 1, Parts 1, 3<br>Investigation 3, Part 1<br>Resources<br><b>Landforms</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-3<br><b>Food and Nutrition</b><br>Investigation 1, Parts 1-2<br><b>Earth History</b><br>Investigation 4, Parts 5-6<br><b>Chemical Interactions</b><br>Investigation 7, Parts 1-5<br>Investigation 8, Part 1<br><b>Weather and Water</b><br>Investigation 6, Part 1 | Pages 8-15, 21-24<br>Pages 8-14<br>Pages 1-3<br><br>Pages 8-22<br>Pages 8-24<br><br>Pages 8-20<br><br>Pages 150-162<br><br>Pages 2-4-234<br>Pages 248-255<br><br>Pages 190-193 |

**Concept I: Mass is conserved during any physical or chemical change**

| Grade Level Expectation   | FOSS   | Page(s)     |
|---|--|-------------|
| <i>Scope and Sequence – Properties of and Changes in Matter</i>     |  |             |
| a. Demonstrate and provide evidence that mass is conserved during a | <b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Chemical Interactions</b> | Pages 16-20 |

|                 |   |                              |
|-----------------|---|------------------------------|
| physical change | Investigation 8, Parts 2-3<br>Resources | Pages 256-268<br>Pages 63-68 |
|-----------------|---|------------------------------|

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A:** Forms of energy have a source, a means of transfer (work and heat), and a receiver

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence --<br/>Forms of Energy: Light</i>   | <b>Food and Nutrition</b><br>Science Stories  | Pages 21, 36, 43  |
| a. Identify sources of visible light (e.g., the Sun and other stars, flint, bulb, flames, lightning)  | <b>Water Planet</b><br>Science Resources<br><b>Solar Energy</b><br>Investigation 1, Parts 1-2<br>Science Stories<br><b>Electronics</b><br>Investigation 1, Parts 1-2<br>Resources<br><b>Human Brain and Senses</b><br>Investigation 3, Part 1<br>Resources<br><b>Planetary Science</b><br>Investigation 3, Part 1<br><b>Populations &amp; Ecosystems</b><br>Investigation 5, Parts 1-2<br>Resources<br><b>Weather and Water</b><br>Investigation 3, Part 1<br>Resources | Page 3<br>Pages 8-21<br>Pages 1-2, 8-9, 12-13<br>Pages 55-65<br>Pages 1-2<br>Pages 92-100<br>Page 31<br>Pages 89-93<br>Pages 142-155<br>Page 17<br>Pages 93-96<br>Pages 22-24 |
| b. Describe evidence (i.e., cannot bend around walls) that visible light travels in a straight line, using the appropriate tools (i.e., pinhole viewer, ray box, laser pointer) | <b>Solar Energy</b><br>Investigation 1, Parts 1-2<br>Science Stories<br><b>Human Brain and Senses</b><br>Investigation 3, Parts 1-2<br>Resources<br><b>Planetary Science</b><br>Investigation 2, Part 2<br><b>Weather and Water</b><br>Investigation 3, Part 3  | Pages 8-21<br>Pages 8-9<br>Pages 92-105<br>Pages 31-33<br>Pages 71-77<br>Pages 103-110  |
| c. Compare the reflection of visible light by various surfaces (i.e., mirror, smooth and rough surfaces, shiny and dull surfaces, moon)   | <b>Human Brain and Senses</b><br>Investigation 3, Parts 1-3<br>Resources<br>CD, Optics Bench: Bending of Light in Materials; Lenses   | Pages 92-110<br>Pages 31-34   |
| d. Compare the refraction of visible light passing through different transparent and translucent materials (e.g., prisms, water, a lens)  | <b>Human Brain and Senses</b><br>Investigation 3, Parts 1-3<br>Resources<br>CD, Optics Bench: Bending of Light in Materials; Lenses   | Pages 92-110<br>Pages 31-34   |
| e. Predict how different surfaces (transparent, translucent, opaque) and lenses (convex, concave) affect the behavior of visible light rays and the                             | <b>Human Brain and Senses</b><br>Investigation 2, Parts 1-3<br>Investigation 3, Parts 2-3<br>Resources<br>CD, Vision: How the Eye Works   | Pages 73-83<br>Pages 101-110<br>Pages 31-25, 39   |

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| <p>resulting image of an object</p> <p>f. Identify receivers of visible light energy (e.g., eye, photocell)</p> <p>g. Recognize that an object is “seen” only when the object emits or reflects light to the eye</p> <p>h. Recognize differences in wavelength and energy levels within that range of visible light that can be seen by the human eye are perceived as differences in color</p> <p><i>Scope and Sequence – Forms of Energy: Sound</i></p> <p>i. Describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium</p> <p>j. Predict how the properties of the medium (e.g., air, water, empty space, rock) affect the speed of different types of mechanical waves (i.e., earthquake, sound)</p> | <p><b>Human Brain and Senses</b><br/>Investigation 2, Parts 2-3<br/>Investigation 4, Part 2<br/>Resources<br/>CD, Vision: How the Eye Works</p> <p><b>Human Brain and Senses</b><br/>Investigation 2, Parts 1-3<br/>Investigation 4, Part 2<br/>Resources</p> <p><b>Human Brain and Senses</b><br/>Investigation 4, Part 2<br/>Resources<br/><b>Planetary Science</b><br/>Resources</p> <p><b>Human Brain and Senses</b><br/>Resources</p> | <p>Pages 73-83<br/>Pages 129-135<br/>Pages 29-30, 36-44</p> <p>Pages 67-84<br/>Pages 129-135<br/>Pages 31-44</p> <p>Pages 129-135<br/>Page 65</p> <p>Page 99</p> <p>Page 69</p> |
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**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <p><i>scope and Sequence -- Forms of Energy: Light</i></p> <p>a. Recognize energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation, and ultraviolet radiation</p> <p><i>Scope and Sequence – Characteristics of Living Organisms</i></p> <p>b. Recognize the Sun is the source of almost all energy used to produce the food for living organisms</p> | <p><b>Solar Energy</b><br/>Science Stories<br/><b>Weather and Water</b><br/>Resources</p> <p><b>Environments</b><br/>Science Stories<br/><b>Water Planet</b><br/>Investigation 3, Parts 1-2<br/>Science Resources<br/><b>Food and Nutrition</b><br/>Science Stories<br/><b>Solar Energy</b><br/>Science Stories</p> | <p>Pages 1-5<br/>Pages 63-64</p> <p>Pages 39-40<br/>Pages 118-125<br/>Pages 31-36, 47-48<br/>Page 43<br/>Pages 1-5</p> |

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|  | <b>Diversity of Life</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 5, Parts 2-3<br>Resources | Page 36<br><br>Pages 151-160<br>Pages 14-15, 17-21 |
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## STRAND 2

Properties and Principles of Force and Motion  
Not assessed at this level

## STRAND 3

**Characteristics and Interactions of Living Organisms**

**1. There is a fundamental unity underlying the diversity of all living organisms**

**Concept A: Organisms have basic needs for survival**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence – Characteristics of Living Organisms</i><br>a. Describe the common life processes necessary to the survival of organisms (i.e., growth, reproduction, life span, response to stimuli, energy use, exchange of gases, use of water, elimination of waste) | <b>Food and Nutrition</b><br>Science Stories<br><b>Living Systems</b><br>Investigation 1, Parts 1-3<br>Science Resources<br><b>Diversity of Life</b><br>Investigation 1, Parts 1-2<br>Resources<br><b>Human Brain and Senses</b><br>Investigation 8, Parts 1-2<br>Resources | Pages 6-9, 41-43, 44-50<br><br>Pages 51-70<br>Pages 1-13<br><br>Pages 43-63<br>Pages 21-23<br><br>Pages 240-252<br>Pages 59-74 |

**Concept C: Cells are the fundamental units of structure and function of all living things**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence – Characteristics of Living Organisms</i><br>a. Recognize all organisms are composed of cells, the fundamental units of life, which carry on all life processes | <b>Food and Nutrition</b><br>Science Stories<br><b>Living Systems</b><br>Investigation 1, Part 1<br>Science Resources<br><b>Diversity of Life</b><br>Investigation 3, Parts 1-3<br>Investigation 4, Parts 1-2<br>Resources<br>CD, Ribbon of Life | Pages 41-43<br><br>Pages 51-59<br>Pages 1-3<br><br>Pages 102-122<br>Pages 133-141<br>Pages 24-30 |

**Concept E: Biological classifications are based on how organisms are related**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence – Characteristics of Living Organisms</i><br>a. Recognize most of the organisms on Earth are unicellular (e.g., bacteria, protists) and other organisms, including humans, are multicellular<br><br>b. Identify examples of unicellular (e.g., bacteria, some protists, fungi) and | <b>Diversity of Life</b><br>Investigation 3, Parts 1-3<br>Investigation 10, Parts 1-3<br>Resources<br>Video: The Unknown World<br><br><b>Diversity of Life</b><br>Investigation 3, Parts 1-3<br>Investigation 5, Parts 1-3 | Pages 107-122<br>Pages 302-321<br>Pages 24-29, 65-69<br><br>Pages 107-122<br>Pages 151-170<br>Pages 239-259 |

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| multicellular organisms (e.g., some fungi, plants, animals) | Investigation 8, Parts 1-3<br>Investigation 9, Parts 1-3<br>Resources | Pages 273-289<br>Pages 4-14, 24-29, 31-44, 51-64, 65-69 |
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**2. Living organisms carry out life processes in order to survive**

**Concept A: The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means**

| Grade Level Expectation   | FOSS   | Page(s)                      |
|---|--|------------------------------|
| <i>Scope and Sequence – Characteristics of Living Organisms</i>   |  |                              |
| a. Compare and contrast the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplast, and cytoplasm           | <b>Diversity of Life</b><br>Investigation 4, Part 2<br>Resources<br>CD, Ribbon of Life | Pages 137-141<br>Pages 27-30 |
| b. Recognize the chloroplast as the cell structure where food is produced in plants and some unicellular organisms (e.g., algae, some protists) | <b>Diversity of Life</b><br>Resources  | Pages 29-36                  |

**Concept B: Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence – Characteristics of Living Organisms</i>  |  |   |
| a. Recognize plants use energy from the Sun to produce food and oxygen through the process of photosynthesis | <b>Food and Nutrition</b><br>Science Stories<br><b>Living Systems</b><br>Investigation 3, Part 1<br>Science Resources<br><b>Environments</b><br>Science Stories<br><b>Chemical Interactions</b><br>Resources<br><b>Diversity of Life</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 2<br>Resources | Page 43<br>Pages 118-125<br>Pages 31-34, 47-48<br>Pages 39-40<br>Pages 76-77<br>Page 36<br>Pages 151-155<br>Pages 14-15 |

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

**1. Organisms are interdependent with one another and with their environment**

**Concept A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem**

| Grade Level Expectation   | FOSS   | Page(s)                   |
|---|--|---------------------------|
| <i>Scope and Sequence – Ecosystems and Populations</i>  |  |                           |
| a. Identify the biotic factors (populations of organisms) and abiotic factors (e.g., quantity of light and water, | <b>Environments</b><br>Investigation 4, Part 1<br>Science Stories<br>FOSS Web, Activity: Virtual | Pages 8-12<br>Pages 38-41 |

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| range of temperatures, soil composition) that make up an ecosystem | Aquarium<br><b>Populations &amp; Ecosystems</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-3<br>Investigation 4, Parts 1-2<br>Resources<br>Video: Ice and Fire: A Portrait of the Mono Basin | Pages 70-79<br>Pages 90-107<br>Pages 119-129<br>Pages 6-7, 22-29 |
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**Concept B: Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Ecosystems and Populations</i>   |   |   |
| a. Identify populations within a community that are in competition with one another for resources  | <b>Environments</b><br>Science Stories<br><b>Populations &amp; Ecosystems</b><br>Investigation 3, Parts 2-3<br>Investigation 4, Part 2<br>Investigation 6, Parts 2-3<br>Resources   | Pages 40-41, 43-45<br><br>Pages 96-107<br>Pages 122-129<br>Pages 187-197<br>Pages 27-29                                   |
| b. Recognize the factors that affect the number and types of organisms an ecosystem can support (e.g., food availability, abiotic factors such as quantity of light and water, temperature and temperature range, soil composition, disease, competitions from other organisms, predation) | <b>Environments</b><br>Investigation 3, Parts 1-3<br>Investigation 5, Parts 1-3<br>Investigation 6, Parts 1-2<br>Science Stories<br>FOSS Web, Activity: Virtual Aquarium<br><b>Populations &amp; Ecosystems</b><br>Investigation 3, Part 1<br>Investigation 4, Parts 1-2<br>Investigation 6, Parts 1-3<br>Resources | Pages 8-22<br>Pages 8-22<br>Pages 8-16<br>Pages 43-45<br><br>Pages 90-95<br>Pages 119-129<br>Pages 179-197<br>Pages 22-24 |
| c. Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem  | <b>Environments</b><br>Science Stories<br><b>Populations &amp; Ecosystems</b><br>Investigation 3, Parts 2-3<br>Investigation 6, Parts 1-3   | Pages 44<br><br>Pages 96-107<br>Pages 179-197   |

**Concept D: The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence – Ecosystems and Populations</i>  |  |  |
| a. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources), and explain how these | <b>Environments</b><br>Science Stories<br><b>Landforms</b><br>Science Stories<br><b>Chemical Interactions</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 7<br>Resources<br><b>Weather and Water</b><br>Resources | Pages 36-37, 43-45<br><br>Pages 13-14<br><br>Pages 59-62<br><br>Pages 210-214<br>Pages 30-41<br><br>Pages 45-47, 63-66 |

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| activities affect organisms within an ecosystem   |   |                                 |
| b. Predict the impact (beneficial or harmful) of a natural environmental change (e.g., forest fire, flood, volcanic eruption, avalanche) on the organisms in an ecosystem | <b>Environments</b><br>Investigation 6, Parts 1-2<br><b>Populations &amp; Ecosystems</b><br>Investigation 6, Part 3 | Pages 8-17<br><br>Pages 191-197 |
| c. Describe possible solutions to potentially harmful environmental changes within an ecosystem   |   |                                 |

## 2. Matter and energy flow through an ecosystem

**Concept A:** As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Ecosystems and Populations</i>   |   |  |
| a. Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producers, consumers, decomposers, scavengers, and predator/prey relationships | <b>Environments</b><br>Science Stories<br><b>Populations &amp; Ecosystems</b><br>Investigation 4, Part 2<br>Investigation 5, Part 4<br>Resources<br>CD, Mono Lake, Food Web | Pages 41<br><br>Pages 122-129<br>Pages 161-169<br>Pages 17-21            |
| b. Classify populations of unicellular and multicellular organisms as producers, consumers, and decomposers  | <b>Environments</b><br>Science Stories<br><b>Populations &amp; Ecosystems</b><br>Investigation 4, Part 2<br>Investigation 5, Part 4<br>Resources                            | Pages 40-41, 43-44<br><br>Pages 119-129<br>Pages 161- 169<br>Pages 17-21 |

## 3. Genetic variation sorted by the natural selection process explains evidence of biological evolution

**Concept A:** Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence – Ecosystems and Populations</i>   |  |   |
| a. Identify fossils as evidence some types of organisms (e.g., dinosaurs, trilobites, mammoths, giant tree ferns) that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today | <b>Models and Designs</b><br>Science Stories<br><b>Earth History</b><br>Investigation 7, Part 1<br>Resources | Pages 11-16<br><br>Pages 234-242<br>Pages 83-85 |

**Concept C:** Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem

| Grade Level Expectation                                | FOSS                | Page(s) |
|--|---------------------|---------|
| <i>Scope and Sequence – Ecosystems and Populations</i> |                     |         |
| a. Relate examples of                                  | <b>Environments</b> |         |

|  |   |   |
|--|---|---|
| <p>adaptations (specialized structures or behaviors) within a species to its ability to survive in a specific environment (e.g., hollow bones/flight, hollow hair/insulation, dense root structure/compact soil, seeds/food, protection for plant embryo vs. spores, fins/movement in water)</p> | <p>Science Stories<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 8, Parts 1-2<br/>Resources<br/>CD, Octopus Color Change Video, Hawaii: Strangers in Paradise</p> | <p>Pages 3-8, 12-13, 15-17</p> <p>Pages 228-243<br/>Pages 42-45</p> |
| <p>b. Predict how certain adaptations, such as behavior, body structure, or coloration, may offer a survival advantage to an organism in a particular environment</p>  | <p><b>Environments</b><br/>Science Stories<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 6, Part 2<br/>Resources</p>  | <p>Pages 3-8, 12-17</p> <p>Pages 234-243<br/>Pages 42-45, 59-61</p> |

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

| Grade Level Expectation  | FOSS  | Page(s)              |
|--|---|----------------------|
| <p><i>Scope and Sequence – Earth's Resources</i></p> <p>a. Describe the components of soil and other factors that influence soil texture, fertility, and resistance to erosion (e.g., plant roots and debris, bacteria, fungi, worms, rodents)</p> | <p><b>Earth History</b><br/>Investigation 4, Part 4</p> | <p>Pages 147-149</p> |

**Concept B: The hydrosphere is composed of water (a material with unique properties), gases, and other materials**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <p><i>Scope and Sequence – Earth's Resources</i></p> <p>a. Recognize the properties of water that make it an essential component of the Earth system (e.g., its ability to act as a solvent, its ability to remain as a liquid at most Earth temperatures)</p> | <p><b>Landforms</b><br/>Science Stories</p> <p><b>Water Planet</b><br/>Science Resources</p> <p><b>Mixtures and Solutions</b><br/>Investigation 1, Parts 1-4</p> <p><b>Solar Energy</b><br/>Investigation 2, Part 2<br/>Resources</p> <p><b>Chemical Interactions</b><br/>Investigation 1, Part 2<br/>Investigation 4, Part 2</p> <p><b>Weather and Water</b><br/>Investigation 6, Parts 1-4<br/>Resources</p> | <p>Pages 25-28</p> <p>Pages 64-65</p> <p>Pages 8-29</p> <p>Pages 16-24<br/>Pages 2-3, 22-25</p> <p>Pages 46-58<br/>Pages 130-138</p> <p>Pages 190-213<br/>Pages 45-47</p> |

**2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept A: The Earth's materials and surface features are changed through a variety of external processes**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>   | <b>Page(s)</b>   |
|--|---|--|
| <i>Scope and Sequence – Internal Processes and External Events</i>   |   |  |
| a. Make inferences about the formation of sedimentary rocks from their physical properties (e.g., layering and the presence of fossils indicate sedimentation)   | <b>Earth History</b><br>Investigation 4, Parts 5-6<br>Investigation 5, Parts 3-4<br>Resources   | Pages 150-162<br>Pages 183-193<br>Pages 70-71                                      |
| b. Explain how the formation of sedimentary rocks depends on weathering and erosion  | <b>Models and Designs</b><br>Science Stories<br><b>Earth History</b><br>Investigation 4, Parts 4-6<br>Resources   | Pages 11-12<br><br>Pages 147-162<br>Pages 73-75                                    |
| c. Describe how weathering agents and erosional processes (i.e., force of water as it freezes or flows, expansion/contraction due to temperature, force of wind, force of plant roots, action of gravity, chemical decomposition) slowly cause surface changes that create and/or change landforms | <b>Landforms</b><br>Investigation 2, Parts 1-2<br>Investigation 3, Parts 1-3<br>Science Stories<br><b>Earth History</b><br>Investigation 4, Part 4<br>Resources | Pages 8-22<br>Pages 8-24<br>Pages 15-17, 25-29<br><br>Pages 147-149<br>Pages 73-75 |
| d. Describe how the Earth's surface and surface materials can change abruptly through the activity of floods, rock/mudslides, or volcanoes   | <b>Landforms</b><br>Investigation 3, Part 2<br>Science Stories<br><b>Earth History</b><br>Resources   | Pages 15-19<br>Pages 23-24<br><br>Pages 102-103                                    |

**Concept B: There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>  | <b>Page(s)</b>                   |
|--|--|----------------------------------|
| <i>Scope and Sequence – Internal Processes and External Events</i>   |  |                                  |
| a. Identify events (earthquakes, volcanic eruptions) and the landforms created by them on the Earth's surface that occur at different plate boundaries | <b>Landforms</b><br>Science Stories<br><b>Earth History</b><br>Resources | Pages 22-25<br><br>Pages 100-105 |

**Concept D: Changes in the Earth over time can be inferred through rock and fossil evidence**

| <b>Grade Level Expectation</b>                     | <b>FOSS</b> | <b>Page(s)</b> |
|--|-------------|----------------|
| <i>Scope and Sequence – Internal Processes and</i> |             |                |

|   |  |   |
|---|--|---|
| <p><i>External Events</i></p> <p>a. Explain the types of fossils and the processes by which they are formed (i.e., replacement, mold and cast, preservation, trace)</p> <p>b. Use fossil evidence to make inferences about changes on Earth and in its environment (i.e., superposition of rock layers, similarities between fossils in different geographical locations, fossils of seashells indicate the area was once underwater)</p> | <p><b>Models and Designs</b><br/>Science Stories<br/><b>Earth History</b><br/>Resources</p> <p><b>Models and Designs</b><br/>Science Stories<br/><b>Earth History</b><br/>Investigation 7, Parts 1-2<br/>Resources</p> | <p>Page 13</p> <p>Pages 76-88</p> <p>Pages 13-16</p> <p>Pages 234-243</p> <p>Pages 76-77, 83-86</p> |
|---|--|---|

**3. Human activity is dependent upon and affects Earth’s resources and systems**

**Concept A: Earth’s materials are limited natural resources affected by human activity**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence – Earth’s Resources</i></p> <p>a. Relate the comparative amounts of fresh water and salt water on the Earth to the availability of water as a resource for living organisms and human activity</p> <p>b. Describe the affect of human activities (e.g., landfills, use of fertilizers and herbicides, farming, septic systems) on the quality of water</p> | <p><b>Water Planet</b><br/>Science Resources<br/><b>Weather and Water</b><br/>Investigation 7, Parts 1-2<br/>Resources</p> <p><b>Water Planet</b><br/>Science Resources<br/><b>Chemical Interactions</b><br/>Resources<br/><b>Weather and Water</b><br/>Resources</p> | <p>Pages 63-66</p> <p>Pages 232-243</p> <p>Pages 45-46</p> <p>Pages 63-66</p> <p>Pages 59-62</p> <p>Page 46</p> |
| <p><i>Scope and Sequence – Internal Processes and External Events</i></p> <p>c. Analyze the ways humans affect the erosion and deposition of soil and rock materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings, building or removal of dams)</p>   | <p><b>Landforms</b><br/>Science Stories<br/><b>Earth History</b><br/>Resources</p>  | <p>Pages 13-14</p> <p>Pages 64-67</p>   |

**STRAND 6**

**Composition and Structure of the Universe and the Motion of the Objects Within It**

Not assessed at this level

## STRAND 7

### Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking  
**Concept A:** Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Formulate testable questions and hypotheses  | FOSS modules emphasize an inquiry approach. Students ask questions and seek answers using appropriate methods. See for example: |  |
|   | <b>Environments</b><br>Investigation 2, Parts 2-4   | Pages 16-30                                    |
|   | <b>Living Systems</b><br>Investigation 3, Part 3  | Pages 136-141                                  |
|   | <b>Water Planet</b><br>Investigation 3, Part 1  | Pages 125-135                                  |
|   | <b>Variables</b><br>Investigation 3, Part 3   | Pages 20-23                                    |
|   | Investigation 4, Part 3   | Pages 18-23                                    |
|   | <b>Chemical Interactions</b><br>Investigation 9, Part 3   | Pages 298-307                                  |
|   | <b>Diversity of Life</b><br>Investigation 8, Part 2   | Pages 244-252                                  |
|   | <b>Earth History</b><br>Investigation 8, Part 2   | Pages 259-265                                  |
|   | <b>Planetary Science</b><br>Investigation 5, Parts 2-3  | Pages 158-167                                  |
| b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment | <b>Levers and Pulleys</b><br>Investigation 1, Parts 2-3   | Pages 18-28                                    |
|   | <b>Living Systems</b><br>Investigation 3, Part 3  | Pages 136-141                                  |
|   | <b>Water Planet</b><br>Investigation 3, Part 1  | Pages 125-135                                  |
|   | <b>Variables</b><br>Investigation 3, Part 3   | Pages 20-23                                    |
|   | Investigation 4, Part 3   | Pages 18-23                                    |
|   | Science Stories   | Pages 1-3                                      |
|   | <b>Diversity of Life</b><br>Investigation 9, Part 2   | Pages 278-287                                  |
|   | <b>Force and Motion</b><br>Investigation 2, Part 3  | Pages 89-99                                    |
|   | <b>Planetary Science</b><br>Investigation 5, Parts 2-3  | Pages 158-167                                  |
|   | c. Design and conduct a valid experiment  | <b>Environments</b><br>Investigation 2, Part 4 |
| <b>Living Systems</b><br>Investigation 3, Part 3  |   | Pages 136-141                                  |
| <b>Water Planet</b><br>Investigation 3, Part 1  |   | Pages 125-135                                  |
| <b>Variables</b><br>Investigation 3, Part 3   |   | Pages 20-23                                    |
| Investigation 4, Part 3   |   | Pages 18-23                                    |
| <b>Chemical Interactions</b>  |   |  |

|  |  |   |
|--|--|---|
|  | Investigation 5, Part 1<br><b>Diversity of Life</b><br>Investigation 9, Part 2<br><b>Earth History</b><br>Investigation 8, Part 2<br><b>Human Brain and Senses</b><br>Investigation 7, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 2, Part 1   | Pages 153-158<br>Pages 278-285<br>Pages 259-265<br>Pages 158-167<br>Pages 219-225<br>Pages 69-75  |
| d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment  | <b>Environments</b><br>Investigation 2, Parts 2- 4<br><b>Living Systems</b><br>Investigation 3, Part 3<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Variables</b><br>Investigation 3, Part 3<br>Investigation 4, Part 3<br><b>Chemical Interactions</b><br>Investigation 8, Part 2<br><b>Diversity of Life</b><br>Investigation 8, Part 2<br>Investigation 9, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 2, Part 1   | Pages 16-30<br>Pages 136-141<br>Pages 125-135<br>Pages 20-23<br>Pages 8-23<br>Pages 256-262<br>Pages 249-252<br>Pages 278-285<br>Pages 158-167<br>Pages 69-75                         |
| e. Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models) | <b>Environments</b><br>Investigation 6, Parts 1-3<br><b>Living Systems</b><br>Investigation 2, Part 1<br><b>Water Planet</b><br>Investigation 2, Parts 1-3<br><b>Food and Nutrition</b><br>Investigation 4, Parts 1-2<br><b>Models and Designs</b><br>Investigation 4, Parts 1-3<br><b>Solar Energy</b><br>Investigation 4, Parts 1-4<br><b>Diversity of Life</b><br>Investigation 3, Parts 1-3<br><b>Earth History</b><br>Investigation 2, Parts 3-4<br><b>Force and Motion</b><br>Investigation 7, Parts 1-3<br><b>Planetary Science</b><br>Investigation 4, Parts 2-3<br><b>Populations &amp; Ecosystems</b><br>Investigation 3, Parts 1-3<br><b>Weather and Water</b><br>Investigation 1, Part 1 | Pages 8-22<br>Pages 85-106<br>Pages 80-100<br>Pages 8-20<br>Pages 6-20<br>Pages 8-29<br>Pages 102-122<br>Pages 68-74<br>Pages 256-272<br>Pages 126-135<br>Pages 90-107<br>Pages 43-47 |

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation               | FOSS | Page(s) |
|---------------------------------------|------|---------|
| <i>Scope and Sequence - All Units</i> |      |         |

|  |   |  |
|--|---|--|
| <p>a. Make qualitative observations using the five senses</p>            | <p>FOSS investigations emphasize student observations and data collection. See for example:</p> <p><b>Environments</b><br/>Investigation 4, Part 2</p> <p><b>Living Systems</b><br/>Investigation 2, Part 2</p> <p><b>Water Planet</b><br/>Investigation 3, Part 3</p> <p><b>Food and Nutrition</b><br/>Investigation 1, Part 2</p> <p><b>Landforms</b><br/>Investigation 3, Part 3</p> <p><b>Models and Designs</b><br/>Investigation 1, Parts 1-2<br/>Investigation 2, Parts 1-2</p> <p><b>Mixtures and Solutions</b><br/>Investigation 4, Parts 1-2</p> <p><b>Solar Energy</b><br/>Investigation 3, Part 1</p> <p><b>Chemical Interactions</b><br/>Investigation 1, Parts 1-2</p> <p><b>Diversity of Life</b><br/>Investigation 9, Part 2</p> <p><b>Earth History</b><br/>Investigation 3, Part 1</p> <p><b>Electronics</b><br/>Investigation 2, Part 1</p> <p><b>Force and Motion</b><br/>Investigation 5, Part 1</p> <p><b>Human Brain and Senses</b><br/>Investigation 1, Parts 1-4</p> <p><b>Planetary Science</b><br/>Investigation 3, Part 1</p> <p><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 4</p> <p><b>Weather and Water</b><br/>Investigation 5, Parts 2-3</p> | <p>Pages 13-18</p> <p>Pages 99-106</p> <p>Pages 145-157</p> <p>Pages 16-20</p> <p>Pages 20-24<br/>Pages 8-21<br/>Pages 8-21</p> <p>Pages 8-19</p> <p>Pages 8-16</p> <p>Pages 41-58</p> <p>Pages 278-285</p> <p>Pages 88-95</p> <p>Pages 89-93</p> <p>Pages 169-176</p> <p>Pages 37-59</p> <p>Pages 89-93</p> <p>Pages 161-169</p> <p>Pages 163-174</p> |
| <p>b. Determine the appropriate tools and techniques to collect data</p> | <p><b>Landforms</b><br/>Investigation 3, Part 3</p> <p><b>Living Systems</b><br/>Investigation 2, Part 1<br/>Investigation 3, Parts 2-3</p> <p><b>Water Planet</b><br/>Investigation 3, Part 1</p> <p><b>Models and Designs</b><br/>Investigation 2, Parts 1-2</p> <p><b>Variables</b><br/>Investigation 3, Part 3</p> <p><b>Chemical Interactions</b><br/>Investigation 5, Part 1</p> <p><b>Diversity of Life</b><br/>Investigation 3, Parts 1-3</p> <p><b>Force and Motion</b><br/>Investigation 7, Part 1</p> <p><b>Planetary Science</b><br/>Investigation 5, Parts 2-3</p> <p><b>Weather and Water</b></p>   | <p>Pages 20-24</p> <p>Pages 85-98<br/>Pages 126-141</p> <p>Pages 125-135</p> <p>Pages 8-21</p> <p>Pages 20-23</p> <p>Pages 153-158</p> <p>Pages 101-122</p> <p>Pages 256-261</p> <p>Pages 158-167</p>  |

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|---|--|--|
| <p>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, computers, spring scales, balances, magnets, metric rulers, graduated cylinders, stopwatches)</p>                               | <p>Investigation 5, Part 1</p> <p><b>Food and Nutrition</b><br/>Investigation 2, Parts 2-3</p> <p><b>Living Systems</b><br/>Investigation 2, Part 1<br/>Investigation 3, Parts 2-3</p> <p><b>Water Planet</b><br/>Investigation 3, Part 1</p> <p><b>Levers and Pulleys</b><br/>Investigation 1, Parts 2-3</p> <p><b>Solar Energy</b><br/>Investigation 2, Parts 1-2</p> <p><b>Chemical Interactions</b><br/>Investigation 3, Parts 1-2</p> <p><b>Diversity of Life</b><br/>Investigation 3, Parts 1-3</p> <p><b>Earth History</b><br/>Investigation 4, Part 2</p> <p><b>Electronics</b><br/>Investigation 3, Parts 1-3</p> <p><b>Force and Motion</b><br/>Investigation 2, Part 3</p> <p><b>Human Brain and Senses</b><br/>Investigation 4, Parts 1-3</p> <p><b>Planetary Science</b><br/>Investigation 8, Part 3</p> <p><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1</p> <p><b>Weather and Water</b><br/>Investigation 1, Part 2</p> | <p>Pages 152-162</p> <p>Pages 18-28</p> <p>Pages 85-98<br/>Pages 126-141</p> <p>Pages 125-135</p> <p>Pages 18-28</p> <p>Pages 8-24</p> <p>Pages 92-107</p> <p>Pages 102-122</p> <p>Pages 132-137</p> <p>Pages 119-132</p> <p>Pages 89-99</p> <p>Pages 120-143</p> <p>Pages 260-264</p> <p>Pages 142-150</p> <p>Pages 48-53</p> |
| <p>d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, force (weight) to the nearest Newton, time to the nearest second</p> | <p><b>Food and Nutrition</b><br/>Investigation 2, Parts 2-3</p> <p><b>Living Systems</b><br/>Investigation 2, Part 1<br/>Investigation 3, Parts 2-3</p> <p><b>Water Planet</b><br/>Investigation 3, Part 1</p> <p><b>Levers and Pulleys</b><br/>Investigation 4, Parts 1-2</p> <p><b>Mixtures and Solutions</b><br/>Investigation 1, Part 2</p> <p><b>Solar Energy</b><br/>Investigation 2, Parts 1-2<br/>Investigation 3, Parts 1-2</p> <p><b>Variables</b><br/>Investigation 2, Part 1</p> <p><b>Chemical Interactions</b><br/>Investigation 5, Part 1</p> <p><b>Diversity of Life</b><br/>Investigation 6, Part 1</p> <p><b>Force and Motion</b><br/>Investigation 2, Part 3</p> <p><b>Planetary Science</b><br/>Investigation 8, Parts 3-4</p> <p><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1</p> <p><b>Weather and Water</b><br/>Investigation 5, Part 1</p>  | <p>Pages 8-25</p> <p>Pages 85-98<br/>Pages 126-141</p> <p>Pages 125-135</p> <p>Pages 8-20</p> <p>Pages 16-20</p> <p>Pages 8-24<br/>Pages 8-23</p> <p>Pages 8-13</p> <p>Pages 153-158</p> <p>Pages 186-192</p> <p>Pages 89-99</p> <p>Pages 260-270</p> <p>Pages 142-150</p> <p>Pages 152-162</p>                                |

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|---|---|---|
| <p>e. Compare amounts/measurements</p>  | <p><b>Environments</b><br/>Investigation 6, Parts 1-2<br/><b>Living Systems</b><br/>Investigation 2, Part 1<br/>Investigation 3, Parts 2-3<br/><b>Water Planet</b><br/>Investigation 3, Part 1<br/><b>Food and Nutrition</b><br/>Investigation 2, Parts 2-3<br/><b>Levers and Pulleys</b><br/>Investigation 4, Parts 1-2<br/><b>Mixtures and Solutions</b><br/>Investigation 1, Part 2<br/><b>Solar Energy</b><br/>Investigation 3, Parts 1-2<br/><b>Chemical Interactions</b><br/>Investigation 8, Parts 2-3<br/><b>Diversity of Life</b><br/>Investigation 6, Part 1<br/><b>Force and Motion</b><br/>Investigation 2, Part 3<br/><b>Planetary Science</b><br/>Investigation 8, Parts 3-4<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1<br/><b>Weather and Water</b><br/>Investigation 5, Part 1</p> | <p>Pages 8-17<br/><br/>Pages 85-91<br/>Pages 126-141<br/><br/>Pages 125-135<br/><br/>Pages 8-25<br/><br/>Pages 18-20<br/><br/>Pages 16-20<br/><br/>Pages 8-23<br/><br/>Pages 256-268<br/><br/>Pages 186-192<br/><br/>Pages 89-99<br/><br/>Pages 260-270<br/><br/>Pages 142-150<br/><br/>Pages 152-162</p> |
| <p>f. Judge whether measurements and computation of quantities are reasonable</p> | <p><b>Levers and Pulleys</b><br/>Investigation 4, Parts 1-2<br/><b>Living Systems</b><br/>Investigation 2, Part 1<br/>Investigation 3, Parts 2-3<br/><b>Water Planet</b><br/>Investigation 3, Part 1<br/><b>Mixtures and Solutions</b><br/>Investigation 1, Part 2<br/><b>Solar Energy</b><br/>Investigation 3, Parts 1-2<br/><b>Diversity of Life</b><br/>Investigation 6, Part 1<br/><b>Force and Motion</b><br/>Investigation 7, Parts 1-3<br/><b>Human Brain and Senses</b><br/>Investigation 4, Parts 1-3<br/><b>Planetary Science</b><br/>Investigation 8, Parts 3-4<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1<br/><b>Weather and Water</b><br/>Investigation 5, Part 1</p>   | <p>Pages 8-20<br/><br/>Pages 85-98<br/>Pages 126-141<br/><br/>Pages 125-135<br/><br/>Pages 16-20<br/><br/>Pages 8-23<br/><br/>Pages 186-192<br/><br/>Pages 256-272<br/><br/>Pages 120-143<br/><br/>Pages 260-270<br/><br/>Pages 142-150<br/><br/>Pages 152-162</p>  |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation  | FOSS  | Page(s) |
|--|---|---------|
| <p><i>Scope and Sequence - All Units</i><br/>a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)</p> | <p>FOSS modules emphasize the use of evidence to formulate explanations. See for example:</p> |         |

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|--|---|--|
|  | <b>Environments</b><br>Investigation 3, Parts 1-3<br><b>Living Systems</b><br>Investigation 3, Parts 2-3<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Food and Nutrition</b><br>Investigation 3, Part 2<br><b>Landforms</b><br>Investigation 3, parts 1-2<br><b>Mixtures and Solutions</b><br>Investigation 1, Part 2<br><b>Solar Energy</b><br>Investigation 2, Parts 1-2<br><b>Variables</b><br>Investigation 3, Parts 2-3<br><b>Chemical Interactions</b><br>Investigation 10, Part 2<br><b>Diversity of Life</b><br>Investigation 6, Part 1<br><b>Earth History</b><br>Investigation 8, Part 2<br><b>Electronics</b><br>Investigation 6, Part 4<br><b>Force and Motion</b><br>Investigation 2, Part 3<br><b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3<br><b>Planetary Science</b><br>Investigation 5, Parts 1-7<br><b>Populations &amp; Ecosystems</b><br>Investigation 6, Part 2<br><b>Weather and Water</b><br>Investigation 5, Parts 1-3 | Pages 8-22<br>Pages 126-141<br>Pages 125-135<br>Pages 16-20<br>Pages 8-19<br>Pages 16-20<br>Pages 8-24<br>Pages 14-23<br>Pages 330-336<br>Pages 186-192<br>Pages 259-265<br>Pages 201-208<br>Pages 89-99<br>Pages 120-143<br>Pages 154-182<br>Pages 187-190<br>Pages 152-174 |
| b. Use data as support for observed patterns and relationships, and to make predictions to be tested | <b>Environments</b><br>Investigation 6, Part 2<br><b>Living Systems</b><br>Investigation 3, Part 2<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Levers and Pulleys</b><br>Investigation 1, Part 2<br><b>Solar Energy</b><br>Investigation 2, Parts 1-2<br><b>Variables</b><br>Investigation 1, Parts 1-3<br><b>Chemical Interactions</b><br>Investigation 8, Part 3<br><b>Electronics</b><br>Investigation 2, Part 1<br><b>Force and Motion</b><br>Investigation 5, Parts 1-4<br><b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Populations &amp; Ecosystems</b><br>Investigation 6, Part 2<br><b>Weather and Water</b>   | Pages 14-17<br>Pages 126-135<br>Pages 125-135<br>Pages 18-23<br>Pages 8-24<br>Pages 8-27<br>Pages 263-268<br>Pages 89-93<br>Pages 169-201<br>Pages 120-143<br>Pages 158-167<br>Pages 187-190   |

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| c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions) | Investigation 3, Part 1<br>Investigation 5, Part 1          | Pages 93-96<br>Pages 152-162 |
|  | <b>Food and Nutrition</b><br>Investigation 1, Part 2        | Pages 16-20                  |
|  | <b>Living Systems</b><br>Investigation 3, Part 2            | Pages 126-135                |
|  | <b>Water Planet</b><br>Investigation 3, Part 1              | Pages 125-135                |
|  | <b>Models and Designs</b><br>Investigation 1, Parts 1-3     | Pages 8-25                   |
|  | <b>Variables</b><br>Investigation 2, Parts 1-3              | Pages 8-23                   |
|  | <b>Chemical Interactions</b><br>Investigation 8, Part 2     | Pages 256-262                |
|  | <b>Diversity of Life</b><br>Investigation 6, Part 1         | Pages 186-192                |
|  | <b>Electronics</b><br>Investigation 6, Part 4               | Pages 201-208                |
|  | <b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3 | Pages 120-143                |
| <b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1   | Pages 142-150   |                              |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Evaluate the reasonableness of an explanation (conclusion)   | FOSS investigations encourage evaluation of explanations. See for example:<br><b>Variables</b><br>Investigation 1, Part 2<br><b>Living Systems</b><br>Investigation 3, Part 3<br><b>Water Planet</b><br>Investigation 2, Parts 1-3<br><b>Environments</b><br>Investigation 5, Parts 2-3<br><b>Levers and Pulleys</b><br>Investigation 4, Part 2<br><b>Diversity of Life</b><br>Investigation 9, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 3, Parts 1, 3 | Pages 16-22<br>Pages 136-141<br>Pages 86-100<br>Pages 14-22<br>Pages 14-20<br>Pages 278-285<br>Pages 158-167<br>Pages 93-96, 103-110 |
| c. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) | <b>Variables</b><br>Investigation 1, Parts 2-3<br>Investigation 3, Parts 2-3<br><b>Living Systems</b><br>Investigation 3, Part 3<br><b>Water Planet</b><br>Investigation 2, Parts 1-3<br><b>Levers and Pulleys</b><br>Investigation 4, Part 2<br><b>Force and Motion</b><br>Investigation 7, Part 2   | Pages 16-27<br>Pages 14-23<br>Pages 136-141<br>Pages 86-100<br>Pages 14-20<br>Pages 262-266  |

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|--|---|----------------------|
|  | <b>Planetary Science</b><br>Investigation 5, Parts 2-3  | Pages 158-167        |
|  | <b>Weather and Water</b><br>Investigation 3, Parts 1, 3 | Pages 93-96, 103-110 |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>  | <b>Page(s)</b>   |
|--|--|--|
| <i>Scope and Sequence - All Units</i>  |  |  |
| a. Communicate the procedures and results of investigations and explanations through:<br>-oral presentations<br>-drawings and maps<br>-data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)<br>-graphs (bar, single line, pictograph)<br>-writings | FOSS modules emphasize student communication. See for example:<br><b>Environments</b><br>Investigation 1, Parts 1-2<br><b>Living Systems</b><br>Investigation 3, Parts 2-3<br><b>Water Planet</b><br>Investigation 3, Part 1<br><b>Food and Nutrition</b><br>Investigation 4, Part 2<br><b>Landforms</b><br>Investigation 1, Parts 1-3<br>Investigation 3, Parts 1-3<br><b>Levers and Pulleys</b><br>Investigation 4, Part 3<br><b>Mixtures and Solutions</b><br>Investigation 4, Part 4<br><b>Models and Designs</b><br>Investigation 4, Parts 1-2<br><b>Solar Energy</b><br>Investigation 4, Part 4<br><b>Variables</b><br>Investigation 4, Part 4<br><b>Diversity of Life</b><br>Investigation 9, Part 3<br><b>Earth History</b><br>Investigation 8, Part 4<br><b>Electronics</b><br>Inv. 6, Ext. the Exp. #2<br><b>Force and Motion</b><br>Investigation 3, Parts 1-2<br><b>Human Brain and Senses</b><br>Investigation 7, Parts 1-3<br><b>Planetary Science</b><br>Investigation 10, Part 3<br><b>Populations &amp; Ecosystems</b><br>Investigation 7<br><b>Weather and Water</b><br>Inv. 9, Ext. the Exp. #9 | Pages 8-19<br>Pages 126-141<br>Pages 125-135<br>Pages 16-20<br>Pages 8-24<br>Pages 8-24<br>Pages 21-25<br>Pages 25-28<br>Pages 11-15<br>Pages 29-33<br>Pages 24-28<br>Pages 286-289<br>Pages 270-274<br>Page 209<br>Pages 111-123<br>Pages 210-230<br>Pages 322-324<br>Pages 210-217<br>Page 320 |

## STRAND 8

### Impact of Science, Technology and Human Activity

**1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs**

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| <b>Grade Level Expectation</b>  | <b>FOSS</b> | <b>Page(s)</b> |
|---------------------------------|-------------|----------------|
| <i>Scope and Sequence - All</i> |             |                |

|  |   |   |
|--|---|---|
| <p><i>Units</i></p> <p>a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)</p> | <p><b>Environments</b><br/>Science Stories</p> <p><b>Food and Nutrition</b><br/>Science Stories</p> <p><b>Landforms</b><br/>Science Stories</p> <p><b>Mixtures and Solutions</b><br/>Science Stories</p> <p><b>Models and Designs</b><br/>Science Stories</p> <p><b>Solar System</b><br/>Science Stories</p> <p><b>Chemical Interactions</b><br/>Resources</p> <p><b>Diversity of Life</b><br/>Resources</p> <p><b>Electronics</b><br/>Resources</p> <p><b>Human Brain and Senses</b><br/>Resources</p> <p><b>Planetary Science</b><br/>Resources</p> <p><b>Weather and Water</b><br/>Investigation 6, Part 5<br/>Resources</p> | <p>Pages 47-48</p> <p>Pages 16-19, 21, 24-25</p> <p>Page 6</p> <p>Pages 43-45</p> <p>Pages 17-20, 28, 44-47, 54-55</p> <p>Pages 29-33, 35-39</p> <p>Pages 84-85</p> <p>Page 69</p> <p>Pages 2, 18-20, 23-25, 34-36</p> <p>Pages 34-35, 49</p> <p>Pages 90-95, 99</p> <p>Pages 214-220<br/>Pages 43-44</p> |
|--|---|---|

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)</p> | <p><b>Environments</b><br/>Science Stories</p> <p><b>Food and Nutrition</b><br/>Science Stories</p> <p><b>Water Planet</b><br/>Science Resources</p> <p><b>Landforms</b><br/>Science Stories</p> <p><b>Models and Designs</b><br/>Science Stories</p> <p><b>Solar System</b><br/>Science Stories</p> <p><b>Electronics</b><br/>Resources</p> <p><b>Human Brain and Senses</b><br/>Resources</p> <p><b>Planetary Science</b><br/>Resources</p> <p><b>Weather and Water</b><br/>Investigation 6, Part 5<br/>Resources</p> | <p>Pages 47-48</p> <p>Pages 16-19, 21, 24-25</p> <p>Pages 18-19, 83</p> <p>Page 6</p> <p>Pages 17-20, 28, 44-47, 54-55</p> <p>Pages 29-33, 35-39</p> <p>Pages 18-20, 23-25, 34-36</p> <p>Page 49</p> <p>Pages 90-95, 99</p> <p>Pages 214-220<br/>Pages 43-44</p> |

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

| Grade Level Expectation  | FOSS   | Page(s)                               |
|--|--|---------------------------------------|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics,</p> | <p><b>Environments</b><br/>Science Stories</p> <p><b>Landforms</b><br/>Science Stories</p> | <p>Pages 43-45</p> <p>Pages 13-14</p> |

|  |  |                           |
|--|--|---------------------------|
| windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally) | <b>Models and Designs</b><br>Science Stories | Pages 29-36               |
|  | <b>Solar System</b><br>Science Stories       | Pages 29-33, 35-39        |
|  | <b>Earth History</b><br>Resources            | Pages 64-67               |
|  | <b>Electronics</b><br>Resources              | Pages 18-20, 23-25, 34-36 |
|  | <b>Human Brain and Senses</b><br>Resources   | Pages 34-35, 49           |
|  | <b>Planetary Science</b><br>Resources        | Pages 90-95, 99           |

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally) | <b>Food and Nutrition</b><br>Science Stories<br><b>Landforms</b><br>Science Stories<br><b>Water Planet</b><br>Science Resources<br><b>Levers</b><br>Science Stories<br><b>Mixtures and Solutions</b><br>Science Stories<br><b>Models and Designs</b><br>Science Stories<br><b>Solar Energy</b><br>Science Stories<br><b>Variables</b><br>Science Stories<br><b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Investigation 2, Part 1<br>Resources<br><b>Electronics</b><br>Resources<br><b>Force and Motion</b><br>Investigation 7, Part 3<br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Investigation 5, Part 1<br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 9, Part 2<br>Resources<br><b>Weather and Water</b><br>Resources | Pages 9, 24-26, 34-36<br>Pages 11-14<br>Pages 15, 18-19<br>Page 4<br>P 5, 9-10, 14-15, 17, 24, 33-36<br>Pages 4-10, 15-16, 25-36<br>Page 34<br>Pages 4-6, 21-28<br>Pages 4-8, 69-72<br>Pages 60-63<br>Pages 50-54, 83-85<br>Pages 2, 23-25<br>Pages 267-272<br>Pages 62-66<br>Page 47<br>Pages 154-157<br>Pages 47-53, 59-62, 71-73<br>Pages 267-273<br>Pages 46-52<br>Pages 21, 38, 67-68 |

**Concept B: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence - All Units</i>  |  |  |
| a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton) | <b>Models and Designs</b><br>Science Stories<br><b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Resources<br><b>Force and Motion</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Resources  | Pages 5-9<br>Pages 69-72, 78-79, 80-83<br>Pages 73-88<br>Pages 50-52<br>Pages 47-48<br>Pages 59-62<br>Pages 49-50                                |
| b. Recognize explanations have changed over time as a result of new evidence   | <b>Models and Designs</b><br>Science Stories<br><b>Variables</b><br>Science Stories<br><b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Resources<br><b>Force and Motion</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Resources | Pages 5-9<br>Pages 4-5<br>Pages 69-72, 80-83<br>Pages 60-63<br>Pages 50-52<br>Pages 23-24, 31, 47-48<br>Pages 59-62, 67-70, 78-79<br>Pages 49-50 |

**3. Science and technology affect, and are affected by, society**

**Concept B: Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <i>Scope and Sequence - All Units</i>   |  |   |
| a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research) | <b>Environments</b><br>Investigation 6, Part 1<br>Science Stories<br><b>Food and Nutrition</b><br>Investigation 4, Part 1<br>Science Stories<br><b>Landforms</b><br>Science Stories<br><b>Mixtures and Solutions</b><br>Science Stories<br><b>Models and Designs</b><br>Science Stories<br><b>Solar Energy</b><br>Inv. 4 Science Ext. #2<br>Science Stories<br><b>Variables</b><br>Science Stories<br><b>Chemical Interactions</b> | Pages 8-13<br>Pages 43-46, 47-48<br>Pages 8-15<br>Pages 24-25, 30-33<br>Pages 15-21<br>Pgs 7-9, 14-15, 21-22, 43-45<br>Pages 25-27, 33-36<br>Page 36<br>Pages 16-18, 29-31, 32-39<br>Pages 27-28, 34-37 |

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|---|--|---|
| <p>b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p> | <p>Resources<br/> <b>Earth History</b><br/> Investigation 2, Part 1<br/> Resources<br/> <b>Electronics</b><br/> Resources<br/> <b>Force and Motion</b><br/> Investigation 8, Parts 1-2<br/> Resources<br/> <b>Human Brain and Senses</b><br/> Investigation 1, Parts 1-4<br/> Resources<br/> <b>Planetary Science</b><br/> Resources<br/> Investigation 7, Parts 1-5<br/> <b>Populations &amp; Ecosystems</b><br/> Investigation 7<br/> Resources<br/> <b>Weather and Water</b><br/> Investigation 9, Part 4<br/> Resources<br/> <br/> <b>Environments</b><br/> Investigation 6, Part 1<br/> Science Stories<br/> <b>Food and Nutrition</b><br/> Investigation 4, Part 1<br/> Science Stories<br/> <b>Water Planet</b><br/> Science Resources<br/> <b>Landforms</b><br/> Science Stories<br/> <b>Mixtures and Solutions</b><br/> Science Stories<br/> <b>Models and Designs</b><br/> Science Stories<br/> <b>Solar Energy</b><br/> Investigation 4, Parts 1-4<br/> Science Stories<br/> <b>Variables</b><br/> Science Stories<br/> <b>Chemical Interactions</b><br/> Resources<br/> <b>Earth History</b><br/> Resources<br/> <b>Electronics</b><br/> Resources<br/> <b>Force and Motion</b><br/> Resources<br/> <b>Human Brain and Senses</b><br/> Resources<br/> <b>Planetary Science</b><br/> Resources<br/> <b>Populations &amp; Ecosystems</b><br/> Investigation 7<br/> Resources<br/> <b>Weather and Water</b><br/> Investigation 9, Part 4<br/> Resources</p> | <p>Pages 60, 69-72<br/> <br/> Pages 60-63<br/> Pages 50-54<br/> <br/> Pages 18-21, 23-25, 34-36<br/> <br/> Pages 284-301<br/> Pages 70-74<br/> <br/> Pages 37-59<br/> Pages 75-78<br/> <br/> Pages 74-77<br/> Pages 218-237<br/> <br/> Pages 210-217<br/> Pages 8-13, 25-29<br/> <br/> Pages 315-318<br/> Pages 45-47<br/> <br/> <br/> Pages 8-13<br/> Pages 43-46, 47-48, 49-52<br/> <br/> Pages 8-15<br/> Pages 19, 21-23, 39-40<br/> <br/> Page 66<br/> <br/> Pages 19-21<br/> <br/> Pages 21-22<br/> <br/> Pages 44-47, 48-55<br/> <br/> Pages 8-36<br/> Pages 29-31, 32-34, 35-39<br/> <br/> Pages 34-37<br/> <br/> Pages 60, 61, 84-85<br/> <br/> Pages 64-67<br/> <br/> Pages 12-14, 18-21, 23-25<br/> <br/> Pages 70-74<br/> <br/> Pages 34-35, 80-82<br/> <br/> Pages 74-77<br/> <br/> Pages 210-217<br/> Pages 25-29, 55<br/> <br/> Pages 315-318<br/> Pages 45-47, 63-66</p> |
|---|--|---|

# GRADE SEVEN

## STRAND 1

### Properties and Principles of Matter and Energy

**1. Changes in properties and states of matter provide evidence of the atomic theory of matter**

**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

| Grade Level Expectation   | FOSS  | Page(s)                                  |
|---|---|--|
| <p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Describe the relationship between temperature and the movement of atmospheric gases (i.e., warm air rises due to expansion of the volume of gas, cool air sinks due to contraction of the volume of gas)</p> | <p><b>Weather and Water</b><br/>Investigation 5, Part 3<br/>Resources</p> | <p>Pages 169-174<br/>Pages 24, 32-33</p> |

**Concept I: Mass is conserved during any physical or chemical change**

| Grade Level Expectation  | FOSS   | Page(s)                              |
|--|--|--------------------------------------|
| <p><i>Scope and Sequence – Weather and Climate</i></p> <p>a. Explain that the amount of matter remains constant while being recycled through the water cycle</p> | <p><b>Weather and Water</b><br/>Investigation 7, Parts 1-2<br/>Resources<br/>CD, Cycles: Water Cycle</p> | <p>Pages 232-243<br/>Pages 45-47</p> |

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A: Forms of energy have a source, a means of transfer (work and heat), and a receiver**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <p><i>Scope and Sequence – Forms of Energy: Heat</i></p> <p>a. Recognize thermal energy as the random motion (kinetic energy) of molecules or atoms within a substance</p> | <p><b>Chemical Interactions</b><br/>Investigation 4, Part 1<br/>Resources<br/><b>Weather and Water</b><br/>Investigation 4, Parts 1-2<br/>Resources</p>                             | <p>Pages 122-129<br/>Pages 32-37<br/>Pages 121-139<br/>Pagea 22-26</p>                   |
| <p>b. Use the kinetic molecular model to explain changes in the temperature of a material</p>  | <p><b>Chemical Interactions</b><br/>Investigation 4, Part 2<br/>Resources<br/><b>Weather and Water</b><br/>Investigation 4, Parts 1-2<br/>Resources</p>                             | <p>Pages 130-138<br/>Pages 32-37<br/>Pages 121-139<br/>Pages 22-26</p>                   |
| <p>c. Recognize thermal energy is transferred as heat from warmer objects to cooler objects until both reach the same temperature (equilibrium)</p>                        | <p><b>Chemical Interactions</b><br/>Investigation 5, Parts 1-3<br/>Resources<br/><b>Weather and Water</b><br/>Investigation 4, Part 2<br/>Investigation 5, Part 2<br/>Resources</p> | <p>Pages 153-171<br/>Pages 32-37<br/>Pages 131-139<br/>Pages 163-168<br/>Pages 22-26</p> |
| <p>d. Recognize the type of materials that transfer energy by conduction, convection, and/or radiation</p>   | <p><b>Weather and Water</b><br/>Investigation 4, Part 2<br/>Investigation 5, Parts 2-3<br/>Resources<br/>Video: Conduction through</p>  | <p>Pages 131-139<br/>Pages 163-174<br/>Pages 22-26, 32-33</p>                            |

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|--|---|---|
| <p>e. Describe how heat is transferred by conduction, convection, and radiation, and classify examples of each</p> <p>f. Classify common materials (e.g., wood, foam, plastic, glass, aluminum foil, soil, air, water) as conductors or insulators of thermal energy</p> <p>g. Predict the differences in temperature over time on different colored (black and white) objects placed under the same heat source</p> | <p>Metals</p> <p><b>Weather and Water</b><br/>Investigation 4, Part 2<br/>Investigation 5, Parts 2-3<br/>Resources<br/>CD, Matter and Energy:<br/>Molecules in Solids, Liquids and Gases<br/>Video: Conduction through Metals</p> <p>This topic is addressed in the grade 6 module <u>Solar Energy</u>.</p> | <p>Pages 131-139<br/>Pages 163-174<br/>Pages 22-26, 32-33</p> |
| <p><i>Scope and Sequence – Forms of Energy: Electricity and Magnetism</i></p>  |   |   |
| <p>h. Describe the interactions (i.e., repel, attract) of like and unlike charges (i.e., magnetic, static electric, electrical)</p>  | <p><b>Electronics</b><br/>Resources<br/>CD, Tech Manual: Atoms and Charge; Static Electricity</p>   | <p>Page 26</p>  |
| <p>i. Diagram and identify a complete electric circuit by using a source (battery), means of transfer (wires), and receiver (resistance bulbs, motors, fans)</p>   | <p><b>Electronics</b><br/>Investigation 1, Parts 1-2<br/>CD, Tech Manual: Circuits</p>  | <p>Pages 55-65</p>  |
| <p>j. Observe and describe the evidence of energy transfer in a closed series circuit</p>  | <p><b>Electronics</b><br/>Investigation 1, Parts 1-3</p>  | <p>Pages 55-70</p>  |
| <p>k. Describe the effects of resistance (number of receivers), amount of voltage (number of energy sources), and kind of transfer materials on the current being transferred through a circuit (e.g., brightness of light, speed of motor)</p>  | <p><b>Electronics</b><br/>Investigation 1, Part 4<br/>Investigation 2, Part 1</p>   | <p>Pages 71-75<br/>Pages 89-93</p>                            |
| <p>l. Classify materials as conductors or insulators of electricity when placed within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water)</p>   | <p><b>Electronics</b><br/>Investigation 1, Part 4</p>   | <p>Pages 71-75</p>  |

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|--|---|-------------|
| m. Diagram and distinguish between complete series and parallel circuits | <b>Electronics</b><br>Investigation 1, Part 3<br>CD, Tech Manual: Circuits, Parallel and Series | Pages 66-70 |
| n. Identify advantages and disadvantages of series and parallel circuits | <b>Electronics</b><br>Investigation 1, Part 3<br>CD, Tech Manual: Circuits, Parallel and Series | Pages 66-70 |

**Concept C: Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth**

| Grade Level Expectation   | FOSS  | Page(s)                                |
|---|---|--|
| <i>Scope and Sequence – Weather and Climate</i>                                   |   |  |
| a. Identify solar radiation as the primary source of energy for weather phenomena | <b>Weather and Water</b><br>Investigation 3, Parts 2-3<br>Resources | Pages 97-110<br>Pages 17-19, 23-24, 33 |

**Concept F: Energy can change from one form to another within systems, but the total amount remains the same**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Energy Transformations</i>   |   |   |
| a. Identify the different energy transformations that occur between different systems (e.g., chemical energy in battery converted to electricity in circuit converted to light and heat from a bulb) | <b>Chemical Interactions</b><br>Resources<br><b>Electronics</b><br>Investigation 1, Parts 1-3<br>Resources<br>CD, Tech Manual: Voltage and Batteries  | Pages 73-75<br>Pages 55-70<br>Pages 12-14   |
| b. Recognize that, during an energy transformation, heat is often transferred from one object (system) to another because of a difference in temperature   | <b>Chemical Interactions</b><br>Investigation 5, Part 3<br>Resources<br><b>Electronics</b><br>Resources<br><b>Weather and Water</b><br>Investigation 4, Part 2<br>Investigation 5, Parts 2-3<br>Resources | Pages 165-171<br>Pages 73-75<br>Page 13<br>Pages 131-139<br>Pages 163-174<br>Pages 22-26, 32-33 |
| c. Recognize energy is not lost but conserved as it is transferred and transformed   | <b>Chemical Interactions</b><br>Investigation 5, Part 3<br><b>Weather and Water</b><br>Resources  | Pages 165-171<br>Pages 22-24  |

## STRAND 2

### Properties and Principles of Force and Motion

1. The motion of an object is described by its change in position relative to another object or point

**Concept A: The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)**

| Grade Level Expectation                             | FOSS | Page(s) |
|---|------|---------|
| <i>Scope and Sequence – Force, Motion, and Work</i> |      |         |

|   |   |   |
|---|---|---|
| a. Describe the circular motion of a moving object as the result of a force acting toward the center                | <b>Force and Motion</b><br>Resources<br><b>Planetary Science</b><br>Resources                 | Pages 68-69<br><br>Pages 69-70                  |
| b. Classify different types of motion (e.g., straight line, projectile, circular, vibrational)                      |   |   |
| c. Given an object in motion, calculate its speed (distance/time)   | <b>Force and Motion</b><br>Investigation 2, Parts 2-3<br>Resources                            | Pages 83-99<br>Pages 4-5, 18-19                 |
| d. Interpret a line graph representing an object's motion in terms of distance over time (speed) using metric units | <b>Force and Motion</b><br>Investigation 3, Part 3<br>Investigation 4, Parts 1-3<br>Resources | Pages 89-99<br>Pages 138-155<br>Pages 19, 27-31 |

## 2. Forces affect motion

**Concept A:** Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude change in position, direction, and speed relative to another object (frame of reference)

| Grade Level Expectation  | FOSS  | Page(s)                                     |
|--|---|---|
| <i>Scope and Sequence – Force, Motion, and Work</i>  |   |   |
| a. Identify and describe the types of forces acting on an object in motion, at rest, floating/sinking (i.e., type of force, direction, amount of force in Newtons) | <b>Force and Motion</b><br>Investigation 6, Parts 1-4<br>Resources<br><b>Planetary Science</b><br>Resources | Pages 225-245<br>Pages 68-69<br><br>Page 70 |
| b. Compare the forces acting on an object by using a spring scale to measure them to the nearest Newton  | <b>Force and Motion</b><br>Investigation 6, Part 2<br>Investigation 7, Part 1                               | Pages 229-235<br>Pages 256-261              |

## Concept B: Every object exerts a gravitational force on every other object

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence – Force, Motion, and Work</i>  |  |   |
| a. Recognize every object exerts a gravitational force of attraction on every other object                                 | <b>Force and Motion</b><br>Investigation 7, Part 1<br>Resources<br><b>Planetary Science</b><br>Resources | Pages 256-261<br>Pages 52, 62-63<br><br>Page 70 |
| b. Recognize an object's weight is a measure of the gravitational force of a planet/moon acting on that object             | <b>Weather and Water</b><br>Investigation 2, Part 1  | Pages 69-75                                     |
| c. Compare the amount of gravitational force acting between objects (which is dependent upon their masses and the distance | <b>Force and Motion</b><br>Investigation 7, Part 1<br>Resources  | Pages 256-261<br>Pages 52, 62                   |

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| between them) |  |  |
|---------------|--|--|

**Concept D: Newton’s Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion**

| Grade Level Expectation  | FOSS   | Page(s)  |
|--|--|--|
| <i>Scope and Sequence – Force, Motion, and Work</i>  |  |  |
| a. Compare the effects of balanced and unbalanced forces (including magnetic, gravity, friction, push or pull) on an object’s motion                 | <b>Force and Motion</b><br>Investigation 6, Parts 1-4<br>Investigation 7, Parts 1-3<br>Resources | Pages 225-245<br>Pages 256-272<br>Pages 50-52, 70-74 |
| b. Explain that when forces (including magnetic, gravity, friction, push or pull) are balanced, objects are at rest or their motion remains constant | <b>Force and Motion</b><br>Investigation 6, Part 3<br>Resources                                  | Pages 236-241<br>Page 52                             |
| c. Explain that a change in motion is the result of an unbalanced force acting upon an object  | <b>Force and Motion</b><br>Investigation 6, Parts 3-4<br>Investigation 8, Parts 1-2<br>Resources | Pages 236-245<br>Pages 284-301<br>Pages 70-74        |
| d. Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of the object                         | <b>Force and Motion</b><br>Investigation 5, Part 4<br>Investigation 7, Part 2<br>Resources       | Pages 194-201<br>Pages 262-266<br>Pages 63-66        |

**Concept F: Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done**

| Grade Level Expectation  | FOSS | Page(s) |
|--|------|---------|
| <i>Scope and Sequence – Force, Motion, and Work</i>  |      |         |
| a. Recognize examples of work being done on an object (force applied and distance moved in the direction of the applied force) with and without the use of simple machines |      |         |
| b. Calculate the amount of work done when a force is applied to an object over a distance<br>( $W = F \times d$ )  |      |         |
| c. Explain how simple machines affect the amount of effort force, distance through which a force is applied, and/or direction of force while doing work                    |      |         |
| d. Recognize the amount of work output is never  |      |         |

|  |  |  |
|--|--|--|
| greater than the amount of work input, with or without the use of a simple machine                                     |  |  |
| e. Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why |  |  |

### STRAND 3

Characteristics and Interactions of Living Organisms  
Not assessed at this level

### STRAND 4

Changes in Ecosystems and Interactions of Organisms with their Environments  
Not assessed at this level

### STRAND 5

Processes and Interactions of the Earth's Systems  
(Geosphere, Atmosphere, and Hydrosphere)

1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures

**Concept C:** The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Weather and Climate</i>  |   |  |
| a. Describe the composition of the Earth's atmosphere (i.e., mixture of gases, water and minute particles) and how it circulates as air masses                                       | <b>Weather and Water</b><br>Investigation 2, Part 2<br>Resources<br>CD, Elevator to Space   | Pages 76-80<br>Pages 8-11                                  |
| b. Describe the role atmosphere (e.g., clouds, ozone) plays in precipitation, reflecting and filtering light from the Sun, and trapping heat energy emitted from the Earth's surface | <b>Weather and Water</b><br>Investigation 6, Part 4<br>Investigation 9, Part 4<br>Resources | Pages 206-213<br>Pages 315-318<br>Pages 8-11, 32-36, 63-66 |

**Concept D:** Climate is a description of average weather conditions in a given area over time

| Grade Level Expectation  | FOSS  | Page(s)                  |
|--|---|--------------------------|
| <i>Scope and Sequence – Weather and Climate</i>                                    |   |                          |
| a. Differentiate between weather and climate                                       | <b>Weather and Water</b><br>Investigation 9, Part 3<br>Resources                    | Pages 311-314<br>Page 64 |
| b. Identify factors that affect climate (e.g., latitude, altitude, prevailing wind | <b>Weather and Water</b><br>Investigation 9, Part 3<br>CD, Climate Factors: Climate | Pages 311-314            |

|                                      |         |  |
|--------------------------------------|---------|--|
| currents, amount of solar radiation) | Regions |  |
|--------------------------------------|---------|--|

**2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept E: Changes in the form of water as it moves through Earth's systems are described as the water cycle**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence –<br/>Weather and Climate</i>   |   |   |
| a. Explain and trace the possible paths of water through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface run-off/groundwater flow)   | <b>Diversity of Life</b><br>Investigation 6, Part 3<br><b>Weather and Water</b><br>Investigation 7, Parts 1-2<br>CD, Cycles: Water Cycle<br>Resources | Pages 198-202<br><br>Pages 232-243<br><br>Pages 45-48 |
| b. Relate the different forms water can take (i.e., snow, rain, sleet, fog, clouds, dew, humidity) as it moves through the water cycle to atmospheric conditions (i.e., temperature, pressure, wind direction and speed, humidity) at a given geographic location | <b>Weather and Water</b><br>Investigation 7, Parts 1-2<br>Resources   | Pages 232-243<br>Pages 32-36                          |
| c. Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction, and radiation   | <b>Weather and Water</b><br>Investigation 6, Parts 1-4<br>Resources   | Pages 190-213<br>Pages 32-33, 53-54                   |

**Concept F: Constantly changing properties of the atmosphere occur in patterns which are described as weather**

| Grade Level Expectation   | FOSS   | Page(s)                             |
|---|--|-------------------------------------|
| <i>Scope and Sequence –<br/>Weather and Climate</i>   |  |                                     |
| a. Explain how the differences in surface temperature, due to the different heating and cooling rates of water and soil, affect the temperature and movement of the air above | <b>Weather and Water</b><br>Investigation 8, Part 2<br>Resources<br>CD, Climate Factors: Local<br>Wind | Pages 265-270<br>Pages 32-33, 53-55 |
| b. Recognize the characteristics of air masses (i.e., high/low barometric pressure, temperature) and predict their effect on the weather in a given location                  | <b>Weather and Water</b><br>Investigation 9, Parts 1-2<br>Resources                                    | Pages 296-310<br>Pages 84-86        |
| c. Identify weather conditions associated with cold fronts and warm fronts  | <b>Weather and Water</b><br>Investigation 9, Part 2<br>Resources                                       | Pages 303-310<br>Pages 85-86        |

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|---|---|---|
| d. Identify factors that affect weather patterns in a particular region (e.g., proximity to large bodies of water, latitude, altitude, prevailing wind currents, amount of solar radiation, location with respect to mountain ranges) | <b>Weather and Water</b><br>Investigation 3, Part 3<br>Investigation 8, Part 2<br>Resources<br>CD, Climate Factors: Local Wind; Weather and Landforms | Pages 103-110<br>Pages 265-270<br>Pages 17-19, 54-55, 57-62 |
| e. Collect and interpret weather data (e.g., cloud cover, precipitation, wind speed and direction) from weather instruments and maps to explain present day weather and to predict the next day's weather                             | <b>Weather and Water</b><br>Investigation 1, Part 2<br>Investigation 8, Parts 3-4<br>Investigation 9, Part 2  | Pages 48-53<br>Pages 271-279<br>Pages 303-310               |
| f. Recognize significant changes in temperature and barometric pressure may cause dramatic weather phenomena (i.e., severe thunderstorms, tornadoes, hurricanes)  | <b>Weather and Water</b><br>Investigation 9, Part 2<br>Resources  | Pages 303-310<br>Pages 48-56, 67-76                         |

**3. Human activity is dependent upon and affects Earth's resources and systems**  
**Concept A: Earth's materials are limited natural resources affected by human activity**

| Grade Level Expectation   | FOSS   | Page(s)                      |
|---|--|------------------------------|
| <i>Scope and Sequence – Energy Transformations</i><br>a. Distinguish between renewable (e.g., geothermal, hydroelectric) and nonrenewable (e.g., fossil fuel) energy sources          | <b>Electronics</b><br>Resources                                  | Pages 12-13                  |
| <i>Scope and Sequence – Weather and Climate</i><br>b. Provide examples of how the availability of fresh water for humans and other living organisms is dependent upon the water cycle | <b>Weather and Water</b><br>Investigation 7, Part 1<br>Resources | Pages 232-239<br>Pages 46-47 |

## STRAND 6

### Composition and Structure of the Universe and the Motion of the Objects Within It

**1. The universe has observable properties and structure**

**Concept A: The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies**

| Grade Level Expectation   | FOSS   | Page(s)       |
|---|--|---------------|
| <i>Scope and Sequence – Objects and Their Motion in the Solar System</i><br>a. Classify celestial bodies in the solar system into | <b>Planetary Science</b><br>Investigation 4, Parts 1-2 | Pages 120-131 |

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| <p>categories: Sun, moon, planets, and other small bodies (i.e., asteroids, comets, meteors), based on physical properties</p>  | <p>Investigation 10, Parts 2-3<br/>Resources<br/>CD, Notebooks: Sun; Moon; Solar System</p>                         | <p>Pages 318-324<br/>Pages 84-89</p> |
| <p>b. Compare and contrast the size, composition, atmosphere, and surface of the planets (inner vs. outer) in our solar system and Earth's moon</p>                                       | <p><b>Planetary Science</b><br/>Investigation 10, Parts 2-3<br/>Resources<br/>CD, Notebooks: Moon; Solar System</p> | <p>Pages 318-324<br/>Pages 84-89</p> |
| <p>c. Identify the relative proximity of common celestial bodies (i.e., Sun, moon, planets, smaller celestial bodies such as comets and meteors, other stars) in the sky to the Earth</p> | <p><b>Planetary Science</b><br/>Resources</p>   | <p>Pages 84-89</p>                   |

**Concept B: The Earth has a composition and location suitable to sustain life**

| Grade Level Expectation   | FOSS   | Page(s)            |
|---|--|--------------------|
| <p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p> <p>a. Describe how the Earth's placement in the solar system is favorable to sustain life (i.e., distance from the Sun, temperature, atmosphere)</p>    | <p><b>Planetary Science</b><br/>Resources<br/>CD, Notebook: The Earth</p>    | <p>Page 86</p>     |
| <p>b. Compare and contrast the characteristics of Earth that support life with the characteristics of other planets that are considered favorable or unfavorable to life (e.g., atmospheric gases, extremely high/low temperatures)</p> | <p><b>Planetary Science</b><br/>Resources<br/>CD, Notebook: Solar System</p> | <p>Pages 84-89</p> |

**Concept C: Most of the information we know about the universe comes from the electromagnetic spectrum life**

| Grade Level Expectation   | FOSS   | Page(s)              |
|---|--|----------------------|
| <p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p> <p>a. Recognize stars are separated from one another by vast and different distances, which causes stars to appear smaller than the Sun</p> | <p><b>Planetary Science</b><br/>Investigation 10, Part 1</p> | <p>Pages 312-317</p> |
| <p>b. Compare the distance light travels from the Sun to Earth to the distance light travels from other stars to</p>  |  |                      |

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| Earth using light years |  |  |
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**2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces**

**Concept A:** The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns

| Grade Level Expectation  | FOSS   | Page(s)                     |
|--|--|-----------------------------|
| <i>Scope and Sequence – Objects and Their Motion in the Solar System</i>   |  |                             |
| a. Relate the apparent east-to-west changes in the positions of the Sun, other stars, and planets in the sky over the course of a day to Earth’s counterclockwise rotation about its axis  | <b>Planetary Science</b><br>Investigation 3, Parts 1-2<br>CD, Day/Night Simulation         | Pages 89-98                 |
| b. Describe the pattern that can be observed in the changes in number of hours of visible sunlight, and the time and location of sunrise and sunset, throughout the year   | <b>Weather and Water</b><br>Investigation 3, Part 1<br>Resources                           | Pages 93-96<br>Pages 12-16  |
| c. Recognize, in the Northern Hemisphere, the Sun appears lower in the sky during the winter and higher in the sky during the summer   | <b>Weather and Water</b><br>Investigation 3, Parts 2-3<br>Resources                        | Pages 97-110<br>Pages 17-19 |
| d. Recognize, in winter, the Sun appears to rise in the Southeast and set in the Southwest, accounting for a relatively short day length, and, in summer, the Sun appears to rise in the Northeast and set in the Northwest, accounting for a relatively long day length | <b>Weather and Water</b><br>Resources  | Pages 18-19                 |
| f. Recognize the Sun is never directly overhead when observed from North America   | <b>Weather and Water</b><br>Investigation 3, Parts 2-3<br>Resources<br>CD, Cycles: Seasons | Pages 97-110<br>Pages 17-19 |

**Concept B:** The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns

| Grade Level Expectation  | FOSS  | Page(s)       |
|--|---|---------------|
| <i>Scope and Sequence – Objects and Their Motion in the Solar System</i>   |   |               |
| a. Observe the change in time and location of moon rise, moon set, and the moon’s appearance relative to time of day and | <b>Planetary Science</b><br>Investigation 4, Part 1 | Pages 120-125 |

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| <p>month over several months, and note the pattern in this change</p> <p>b. Recognize the moon rises later each day due to its revolution around the Earth in a counterclockwise direction</p> <p>c. Recognize the Moon is in the sky for roughly 12 hours in a 24-hour period (i.e., if the Moon rises at about 6 P.M., it will set at about 6 A.M.)</p> <p>d. Recognize that one half of the Moon is always facing the Sun and, therefore, one half of the Moon is always lit</p> <p>e. Relate the apparent change in the moon's position in the sky as it appears to move east-to-west over the course of a day to Earth's counterclockwise rotation about its axis</p> <p>f. Describe how the appearance of the moon that can be seen from Earth changes approximately every 28 days in an observable pattern (moon phases)</p> | <p><b>Planetary Science</b><br/>Investigation 4, Part 1<br/>Investigation 9, Part 1</p> <p><b>Planetary Science</b><br/>Investigation 4, Part 1</p> <p><b>Planetary Science</b><br/>Investigation 9, Part 2</p> <p><b>Planetary Science</b><br/>Investigation 4, Part 1<br/>Investigation 9, Part 1</p> <p><b>Planetary Science</b><br/>Investigation 9, Parts 1-4<br/>CD, Phases of the Moon</p> | <p>Pages 120-125<br/>Pages 283-287</p> <p>Pages 120-125</p> <p>Pages 288-292</p> <p>Pages 120-125<br/>Pages 283-287</p> <p>Pages 283-301</p> |
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**Concept C: The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>   | <b>Page(s)</b>   |
|--|---|--|
| <p><i>Scope and Sequence – Objects and Their Motion in the Solar System</i></p> <p>a. Illustrate and explain a day as the time it takes a planet to make a full rotation about its axis</p> <p>b. Diagram the path (orbital ellipse) the Earth travels as it revolves around the Sun</p> <p>c. Illustrate and explain a year as the time it takes a planet to revolve around the Sun</p> | <p><b>Planetary Science</b><br/>Investigation 3, Parts 1-2<br/>CD, Day/Night Simulation<br/><b>Weather and Water</b><br/>Resources</p> <p><b>Weather and Water</b><br/>Resources</p> <p><b>Weather and Water</b><br/>Investigation 3, Parts 2-3<br/>Resources</p> | <p>Pages 89-98</p> <p>Page 17</p> <p>Page 17</p> <p>Pages 97-110<br/>Pages 17-18</p> |

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| d. Explain the relationships between a planet's length of year (period of revolution) and its position in the solar system   | <b>Planetary Science</b><br>Investigation 9, Part 2<br>Resources<br>Notebook: Solar System | Pages 318-322<br>Pages 35, 84-89 |
| e. Describe how the moon's relative position changes as it revolves around the Earth   | <b>Planetary Science</b><br>Investigation 4, Part 1<br>Investigation 9, Part 1             | Pages 120-125<br>Pages 283-287   |
| f. Recognize the phases of the moon are due to the relative positions of the Moon with respect to the Earth and Sun  | <b>Planetary Science</b><br>Investigation 9, Parts 1-4<br>CD, Phases of the Moon           | Pages 283-301                    |
| g. Relate the axial tilt and orbital position of the Earth as it revolves around the Sun to the intensity of sunlight falling on different parts of the Earth during different seasons | <b>Weather and Water</b><br>Investigation 3, Parts 2-3<br>Resources<br>CD, Cycles: Seasons | Pages 97-110<br>Pages 17-19      |

**Concept D: Gravity is a force of attraction between objects in the solar system that governs their motion**

| Grade Level Expectation   | FOSS   | Page(s)                                     |
|---|--|---|
| <i>Scope and Sequence --<br/>Objects and Their Motion in<br/>the Solar System</i>   |  |   |
| a. Describe how the Earth's gravity pulls any object on or near the Earth toward it (including natural and artificial satellites) | <b>Force and Motion</b><br>Investigation 7, Part 1<br>Resources<br><b>Planetary Science</b><br>Resources | Pages 256-261<br>Pages 67-69<br>Pages 69-70 |
| b. Describe how the planets' gravitational pull keeps satellites and moons in orbit around them                                   | <b>Force and Motion</b><br>Resources<br><b>Planetary Science</b><br>Resources                            | Pages 67-69<br>Pages 69-70                  |
| c. Describe how the Sun's gravitational pull holds the Earth and other planets in their orbits                                    | <b>Planetary Science</b><br>Resources  | Page 84                                     |

## STRAND 7 Scientific Inquiry

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**

**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation                   | FOSS                | Page(s) |
|---|---------------------|---------|
| <i>Scope and Sequence - All<br/>Units</i> | FOSS investigations |         |

|   |  |  |
|---|--|--|
| <p>a. Formulate testable questions and hypotheses</p>   | <p>emphasize formulating questions and using appropriate methods to gather evidence. See for example:<br/> <b>Chemical Interactions</b><br/> Investigation 9, Part 3<br/> <b>Diversity of Life</b><br/> Investigation 8, Part 2<br/> <b>Earth History</b><br/> Investigation 8, Part 2<br/> <b>Planetary Science</b><br/> Investigation 5, Parts 2-3</p>   | <p>Pages 298-307<br/> Pages 244-252<br/> Pages 259-265<br/> Pages 158-167</p>  |
| <p>b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment</p>  | <p><b>Diversity of Life</b><br/> Investigation 8, Part 2<br/> <b>Force and Motion</b><br/> Investigation 2, Part 3<br/> <b>Planetary Science</b><br/> Investigation 5, Parts 2-3</p>   | <p>Pages 278-285<br/> Pages 89-99<br/> Pages 158-167</p>   |
| <p>c. Design and conduct a valid experiment</p>   | <p><b>Chemical Interactions</b><br/> Investigation 5, Part 1<br/> <b>Diversity of Life</b><br/> Investigation 8, Part 2<br/> Investigation 9, Part 2<br/> <b>Earth History</b><br/> Investigation 8, Part 2<br/> <b>Human Brain and Senses</b><br/> Investigation 7, Part 2<br/> <b>Planetary Science</b><br/> Investigation 5, Parts 2-3<br/> <b>Weather and Water</b><br/> Investigation 2, Part 1</p>   | <p>Pages 153-158<br/> Pages 244-252<br/> Pages 278-285<br/> Pages 259-265<br/> Pages 219-225<br/> Pages 158-167<br/> Pages 69-75</p> |
| <p>d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment</p>  | <p><b>Chemical Interactions</b><br/> Investigation 8, Part 2<br/> <b>Diversity of Life</b><br/> Investigation 8, Part 2<br/> Investigation 9, Part 2<br/> <b>Planetary Science</b><br/> Investigation 5, Parts 2-3<br/> <b>Weather and Water</b><br/> Investigation 2, Part 1</p>  | <p>Pages 256-262<br/> Pages 249-252<br/> Pages 278-285<br/> Pages 158-167<br/> Pages 69-75</p>                                       |
| <p>e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models)</p> | <p>FOSS provides opportunity for students to be involved in a variety of data gathering methods. See for example:<br/> <b>Diversity of Life</b><br/> Investigation 3, Part 1-3<br/> <b>Earth History</b><br/> Investigation 2, Parts 3-4<br/> <b>Force and Motion</b><br/> Investigation 7, Parts 1-3<br/> <b>Planetary Science</b><br/> Investigation 4, Parts 2-3<br/> <b>Populations &amp; Ecosystems</b><br/> Investigation 3, Parts 1-3<br/> <b>Weather and Water</b></p> | <p>Pages 102-122<br/> Pages 68-74<br/> Page 256-272<br/> Pages 126-135<br/> Pages 90-107</p>   |

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| <p>f. Acknowledge there is no fixed procedure called “the scientific method”, but some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations</p> | <p>Investigation 1, Part 1</p> <p>FOSS investigations provide the opportunity to teach this concept. See investigations listed above in parts a-e.</p> | <p>Pages 43-47</p> |
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**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <p><i>Scope and Sequence - All Units</i></p> <p>a. Make qualitative observations using the five senses</p> <p>b. Determine the appropriate tools and techniques to collect data</p> <p>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)</p> | <p><b>Chemical Interactions</b><br/>Investigation 1, Parts 1-2</p> <p><b>Diversity of Life</b><br/>Investigation 9, Part 2</p> <p><b>Earth History</b><br/>Investigation 3, Part 1</p> <p><b>Electronics</b><br/>Investigation 2, Part 1</p> <p><b>Force and Motion</b><br/>Investigation 5, Part 1</p> <p><b>Human Brain and Senses</b><br/>Investigation 7, Part 1</p> <p><b>Planetary Science</b><br/>Investigation 3, Part 1</p> <p><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 4</p> <p><b>Weather and Water</b><br/>Investigation 5, Parts 2-3</p> <p><b>Chemical Interactions</b><br/>Investigation 5, Part 1</p> <p><b>Diversity of Life</b><br/>Investigation 3, Parts 1-3<br/>Investigation 9, Part 2</p> <p><b>Force and Motion</b><br/>Investigation 7, Part 1</p> <p><b>Planetary Science</b><br/>Investigation 5, Parts 2-3</p> <p><b>Weather and Water</b><br/>Investigation 5, Part 1</p> <p><b>Chemical Interactions</b><br/>Investigation 3, Parts 1-2</p> <p><b>Diversity of Life</b><br/>Investigation 3, Parts 1-3</p> <p><b>Earth History</b><br/>Investigation 4, Part 2</p> <p><b>Electronics</b><br/>Investigation 3, Parts 1-4</p> <p><b>Force and Motion</b><br/>Investigation 2, Part 3</p> | <p>Pages 41-58</p> <p>Pages 278-285</p> <p>Pages 88-95</p> <p>Pages 89-93</p> <p>Pages 169-176</p> <p>Pages 210-218</p> <p>Pages 89-93</p> <p>Pages 161-169</p> <p>Pages 163-174</p> <p>Pages 153-158</p> <p>Pages 102-122<br/>Pages 278-285</p> <p>Pages 256-261</p> <p>Pages 158-167</p> <p>Pages 152-162</p> <p>Pages 92-107</p> <p>Pages 102-122</p> <p>Pages 132-137</p> <p>Pages 119-135</p> <p>Pages 89-99</p> |

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|  | <b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3    | Pages 120-143          |
|  | <b>Planetary Science</b><br>Investigation 8, Parts 3-4         | Pages 260-270          |
|  | <b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1 | Pages 142-150          |
|  | <b>Weather and Water</b><br>Investigation 4, Parts 1-2         | Pages 121-139          |
| d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second | <b>Chemical Interactions</b><br>Investigation 5, Part 1        | Pages 153-158          |
|  | <b>Diversity of Life</b><br>Investigation 6, Part 1            | Pages 186-192          |
|  | <b>Earth History</b><br>Investigation 6, Parts 1, 3            | Pages 89-99            |
|  | <b>Force and Motion</b><br>Investigation 2, Part 3             | Pages 152-162          |
|  | <b>Planetary Science</b><br>Investigation 8, Parts 3-4         | Pages 260-270          |
|  | <b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1 | Pages 142-150          |
|  | <b>Weather and Water</b><br>Investigation 5, Part 1            | Pages 205-208, 215-219 |
| e. Compare amounts/measurements  | <b>Chemical Interactions</b><br>Investigation 8, Parts 2-3     | Pages 256-268          |
|  | <b>Diversity of Life</b><br>Investigation 6, Part 1            | Pages 186-192          |
|  | <b>Force and Motion</b><br>Investigation 2, Part 3             | Pages 89-99            |
|  | <b>Planetary Science</b><br>Investigation 8, Parts 3-4         | Pages 260-270          |
|  | <b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1 | Pages 142-150          |
|  | <b>Weather and Water</b><br>Investigation 5, Part 1            | Pages 152-162          |
| f. Judge whether measurements and computation of quantities are reasonable   | <b>Diversity of Life</b><br>Investigation 6, Part 1            | Pages 186-192          |
|  | <b>Force and Motion</b><br>Investigation 2, Part 3             | Pages 89-99            |
|  | <b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3    | Pages 120-143          |
|  | <b>Planetary Science</b><br>Investigation 8, Parts 3-4         | Pages 260-270          |
|  | <b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1 | Pages 142-150          |
|  | <b>Weather and Water</b><br>Investigation 5, Part 1            | Pages 152-162          |
| g. Calculate the range and average/mean of a set of data   | <b>Chemical Interactions</b><br>Investigation 6                | Pages 178-187          |
|  | <b>Electronics</b><br>Inv. 2, Ext. the Experience              | Page 109               |
|  | <b>Force and Motion</b><br>Investigation 2, Part 3             | Pages 89-99            |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation               | FOSS  | Page(s) |
|---------------------------------------|---|---------|
| <i>Scope and Sequence - All Units</i> | FOSS investigations emphasize that students use |         |

|   |   |  |
|---|---|--|
| <p>a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)</p>  | <p>evidence to make explanations. See for example:<br/> <b>Chemical Interactions</b><br/> Investigation 10, Part 2<br/> <b>Diversity of Life</b><br/> Investigation 6, Part 1<br/> <b>Earth History</b><br/> Investigation 8, Part 2<br/> <b>Electronics</b><br/> Investigation 6, Part 4<br/> <b>Force and Motion</b><br/> Investigation 2, Part 3<br/> <b>Human Brain and Senses</b><br/> Investigation 7, Part 2<br/> <b>Planetary Science</b><br/> Investigation 5, Part 2-3<br/> <b>Populations &amp; Ecosystems</b><br/> Investigation 6, Part 2<br/> <b>Weather and Water</b><br/> Investigation 4, Part 1</p> | <p>Pages 330-336<br/> Pages 186-192<br/> Pages 259-265<br/> Pages 201-208<br/> Pages 89-99<br/> Pages 219-225<br/> Pages 158-167<br/> Pages 187-190<br/> Pages 121-139</p> |
| <p>b. Use data as support for observed patterns and relationships, and to make predictions to be tested</p>   | <p><b>Chemical Interactions</b><br/> Investigation 8, Part 3<br/> <b>Electronics</b><br/> Investigation 2, Part 1<br/> <b>Force and Motion</b><br/> Investigation 7, Part 2-3<br/> <b>Human Brain and Senses</b><br/> Investigation 4, Parts 1-3<br/> <b>Planetary Science</b><br/> Investigation 5, Part 2-3<br/> <b>Populations &amp; Ecosystems</b><br/> Investigation 6, Part 2<br/> <b>Weather and Water</b><br/> Investigation 3, Part 1<br/> Investigation 5, Part 1</p>   | <p>Pages 263-268<br/> Pages 89-93<br/> Pages 262-272<br/> Pages 120-143<br/> Pages 158-167<br/> Pages 187-190<br/> Pages 93-96<br/> Pages 152-162</p>                      |
| <p>c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)</p> | <p><b>Chemical Interactions</b><br/> Investigation 8, Part 2<br/> <b>Diversity of Life</b><br/> Investigation 6, Part 1<br/> <b>Electronics</b><br/> Investigation 6, Part 4<br/> <b>Human Brain and Senses</b><br/> Investigation 4, Parts 1-3<br/> <b>Populations &amp; Ecosystems</b><br/> Investigation 5, Part 1</p>   | <p>Pages 256-262<br/> Pages 186-192<br/> Pages 201-208<br/> Pages 120-143<br/> Pages 142-150</p>   |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation   | FOSS  | Page(s)              |
|---|---|----------------------|
| <p><i>Scope and Sequence - All Units</i><br/> a. Evaluate the reasonableness of an explanation (conclusion)</p> | <p>FOSS investigations provide the opportunity to teach these expectations. See for example:<br/> <b>Diversity of Life</b><br/> Investigation 9, Part 2<br/> <b>Planetary Science</b></p> | <p>Pages 278-285</p> |

|   |   |                      |
|---|---|----------------------|
| b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) | Investigation 5, Parts 2-3<br><b>Weather and Water</b>  | Pages 158-167        |
|   | Investigation 3, Parts 1, 3                             | Pages 93-96, 103-110 |
|   | <b>Force and Motion</b><br>Investigation 7, Part 2      | Pages 262-266        |
|   | <b>Planetary Science</b><br>Investigation 5, Parts 2-3  | Pages 158-167        |
|   | <b>Weather and Water</b><br>Investigation 3, Parts 1, 3 | Pages 93-96, 103-110 |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| Grade Level Expectation  | FOSS  | Page(s)       |
|--|---|---------------|
| <i>Scope and Sequence - All Units</i>  |   |               |
| a. Communicate the procedures and results of investigations and explanations through:<br>-oral presentations<br>-drawings and maps<br>-data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)<br>-graphs (bar, single line, pictograph)<br>-equations and<br>-writings | <b>Diversity of Life</b><br>Investigation 9, Part 3               | Pages 286-289 |
|  | <b>Earth History</b><br>Investigation 8, Part 4                   | Pages 270-274 |
|  | <b>Electronics</b><br>Investigation 3, Parts 1-3                  | Pages 119-132 |
|  | <b>Force and Motion</b><br>Investigation 3, Parts 1-2             | Pages 111-123 |
|  | <b>Human Brain and Senses</b><br>Investigation 7, Parts 1-3       | Pages 210-230 |
|  | <b>Planetary Science</b><br>Investigation 10, Part 3              | Pages 322-324 |
|  | <b>Populations &amp; Ecosystems</b><br>Investigation 6, Parts 1-3 | Pages 179-197 |
|  | <b>Weather and Water</b><br>Inv. 9, Ext. the Exp. #9              | Page 320      |

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A: Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all**

| Grade Level Expectation   | FOSS  | Page(s)                      |
|---|---|------------------------------|
| <i>Scope and Sequence - All Units</i>   |   |                              |
| a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers) | <b>Chemical Interactions</b><br>Resources           | Pages 84-85                  |
|   | <b>Diversity of Life</b><br>Resources               | Page 69                      |
|   | <b>Electronics</b><br>Resources                     | Pages 2, 18-20, 23-25, 34-36 |
|   | <b>Human Brain and Senses</b><br>Resources          | Pages 34-35, 49              |
|   | <b>Planetary Science</b><br>Resources               | Pages 90-95, 99              |
|   | <b>Weather and Water</b><br>Investigation 6, Part 5 | Pages 214-220                |
|   | Resources   | Pages 43-44                  |

**Concept B: Advances in technology often result in improved data collection and an increase in scientific information**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <i>Scope and Sequence - All Units</i>   |  |   |
| a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity) | <b>Electronics</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Resources<br><b>Weather and Water</b><br>Investigation 6, Part 5<br>Resources | Pages 18-20, 23-25, 34-36<br><br>Page 49<br><br>Pages 90-95, 99<br><br>Pages 214-220<br>Pages 43-44 |

**Concept C: Technological solutions to problems often have drawbacks as well as benefits**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally) | <b>Earth History</b><br>Resources<br><b>Electronics</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Resources | Pages 64-67<br><br>Pages 18-20, 23-25, 34-36<br><br>Pages 34-35, 49<br><br>Pages 90-95, 99 |

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally) | <b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Investigation 2, Part 1<br>Resources<br><b>Electronics</b><br>Resources<br><b>Force and Motion</b><br>Investigation 7, Part 3<br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Investigation 5, Part 1<br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 9, Part 2<br>Resources<br><b>Weather and Water</b><br>Resources | Pages 4-8, 69-72<br><br>Pages 60-63<br>Pages 50-54, 83-85<br><br>Pages 2, 23-25<br><br>Pages 267-272<br>Pages 50-52, 62-66<br><br>Page 47<br><br>Pages 154-157<br>Pages 47-53, 59-62, 71-73<br><br>Pages 267-273<br>Pages 46-52<br><br>Pages 21, 38, 67-68 |

**Concept B: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence - All Units</i>  |   |  |
| a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton) | <b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Resources<br><b>Force and Motion</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Resources | Pages 69-72, 78-79, 80-83<br><br>Pages 73-88<br><br>Pages 50-52<br><br>Pages 47-48<br><br>Pages 59-62<br><br>Pages 49-50                   |
| b. Recognize explanations have changed over time as a result of new evidence   | <b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Resources<br><b>Force and Motion</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources<br><b>Planetary Science</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Resources | Pages 69-72, 80-83<br><br>Pages 60-63<br><br>Pages 50-52<br><br>Pages 23-24, 31, 47-48<br><br>Pages 59-62, 67-70, 78-79<br><br>Pages 49-50 |

**3. Science and technology affect, and are affected by, society**

**Concept B: Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence - All Units</i>   |  |  |
| a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research) | <b>Chemical Interactions</b><br>Resources<br><b>Earth History</b><br>Investigation 2, Part 1<br>Resources<br><b>Electronics</b><br>Resources<br><b>Force and Motion</b><br>Investigation 8, Parts 1-2<br>Resources<br><b>Human Brain and Senses</b><br>Investigation 1, Parts 1-4<br>Resources<br><b>Planetary Science</b><br>Investigation 7, Parts 1-5<br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 7<br>Resources<br><b>Weather and Water</b><br>Investigation 9, Part 4<br>Resources | Pages 60, 69-72<br><br>Pages 60-63<br>Pages 50-54<br><br>Pages 18-21, 23-25, 34-36<br><br>Pages 284-301<br>Pages 70-74<br><br>Pages 37-59<br>Pages 75-78<br><br>Pages 218-237<br>Pages 74-77<br><br>Pages 210-217<br>Pages 8-13, 25-29<br><br>Pages 315-318<br>Pages 45-47 |

|   |  |  |
|---|--|--|
| <p>b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p> | <p><b>Planetary Science</b><br/>Resources<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 7<br/><b>Weather and Water</b><br/>Investigation 9, Part 4</p> | <p>Pages 74-77<br/>Pages 210-217<br/>Pages 315-318</p> |
|---|--|--|

# GRADE EIGHT

## STRAND 1

### Properties and Principles of Matter and Energy

**1. Changes in properties and states of matter provide evidence of the atomic theory of matter**

**Concept A: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i>  |   |   |
| a. Recognize elements (unique atoms) and compounds (molecules or crystals) are pure substances that have characteristic properties  | <b>Chemical Interactions</b><br>Investigation 2, Parts 1-2<br>Resources<br><b>Weather and Water</b><br>Resources                              | Pages 70-80<br>Pages 3-9, 97-101<br><br>Pages 6-7                         |
| b. Describe the physical and chemical properties (e.g., magnetic attraction, conductivity, melting point and boiling point, reactivity) of pure substances (elements or compounds) (e.g., copper wire, aluminum wire, iron, charcoal, sulfur, water, salt, sugar, sodium bicarbonate, galena, quartz, magnetite, pyrite) using appropriate senses and tools | <b>Chemical Interaction</b><br>Investigation 2, Parts 1-2<br>Investigation 7, Parts 4-5<br>Resources<br><b>Weather and Water</b><br>Resources | Pages 70-80<br>Pages 222-234<br>Pages 3-9, 73-77, 97-101<br><br>Pages 6-7 |

**Concept C: Objects, and the materials they are made of, have properties that can be used to describe and classify them**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i>   |   |   |
| a. Describe evidence (e.g., diffusion of colored material into clear material such as water; light reflecting off of dust particles in air; changes in physical properties and reactivity such as gold hammered into foil, oil spreading on the surface of water, decay of organic matter, condensation of water vapor by increased pressure) that supports the theory that matter is composed of moving particles too small to be seen (atoms, molecules) | <b>Chemical Interactions</b><br>Investigation 3, Parts 1-3<br>Resources<br><b>Weather and Water</b><br>Investigation 5, Parts 2-3<br>CD, Matter Energy: Molecules in Solids, Liquids and Gases<br>Resources | Pages 92-113<br>Pages 16-22<br><br>Pages 163-168<br><br>Pages 25-36 |

**Concept D: Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter**

| Grade Level Expectation     | FOSS | Page(s) |
|-----------------------------|------|---------|
| <i>Scope and Sequence –</i> |      |         |

|  |  |  |
|--|--|--|
| <p><i>Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Using the Kinetic Theory model, illustrate and account for the physical properties (i.e., shape, volume, malleability, viscosity) of a solid, liquid, or gas in terms of the arrangement and motion of molecules in a substance</p> <p>b. Use the Kinetic Theory model to explain changes in the volume, shape, and viscosity of materials in response to temperature changes during a phase change</p> <p>c. Predict the effect of transfer on the physical properties of a substance as it changes to or from a solid, liquid, or gas (i.e., phase changes that occur during freezing, melting, evaporation, boiling, condensation)</p> | <p><b>Chemical Interactions</b><br/>Investigation 4, Parts 1-3<br/>Resources</p> <p><b>Weather and Water</b><br/>Resources</p> <p><b>Chemical Interactions</b><br/>Investigation 7, Parts 1-5<br/>Resources</p> <p><b>Weather and Water</b><br/>Resources</p> <p><b>Chemical Interactions</b><br/>Investigation 7, Parts 1-5<br/><b>Weather and Water</b><br/>Investigation 6, Parts 2-3</p> | <p>Pages 122-142<br/>Pages 32-37</p> <p>Pages 25-26</p> <p>Pages 204-234<br/>Pages 32-37</p> <p>Pages 25-26</p> <p>Pages 204-234<br/>Pages 194-205</p> |
|--|--|--|

**Concept F: The periodic table organizes the elements according to their atomic structure and chemical reactivity**

| Grade Level Expectation  | FOSS  | Page(s)                                  |
|--|---|--|
| <p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Recognize more than 100 known elements (unique atoms) exist that may be combined in nature or by man to produce compounds that make up the living and nonliving substances in the environment (Do NOT assess memorization of the Periodic Table)</p> | <p><b>Chemical Interaction</b><br/>Investigation 2, Parts 1-2<br/>Resources</p> | <p>Pages 70-80<br/>Pages 3-13, 90-96</p> |

**Concept I: Mass is conserved during any physical or chemical change**

| Grade Level Expectation   | FOSS   | Page(s)                              |
|---|--|--------------------------------------|
| <p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Provide evidence that mass is conserved during a chemical change in a closed system (e.g., vinegar + baking soda,</p> | <p><b>Chemical Interactions</b><br/>Investigation 9, Parts 1-3<br/>Resources</p> | <p>Pages 280-307<br/>Pages 63-68</p> |

|   |   |  |
|---|---|--|
| <p>mold growing in a closed container, steel wool rusting)</p> <p><i>Scope and Sequence – Rock Cycle and Plate Tectonics</i></p> <p>b. Explain that the amount of matter remains constant while being recycled through the rock cycle</p> <p><i>Scope and Sequence – Cells and Body Systems</i></p> <p>c. Explain that the amount of matter remains constant while being recycled through food chains and food webs</p> | <p><b>Earth History</b><br/>Investigation 8, Part 1<br/>Resources</p> <p><b>Chemical Interactions</b><br/>Resources<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 4, Part 2<br/>Resources</p> | <p>Pages 254-258<br/>Pages 93-97</p> <p>Pages 76-77</p> <p>Pages 122-129<br/>Pages 17-21</p> |
|---|---|--|

**2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems**

**Concept A:** Forms of energy have a source, a means of transfer (work and heat), and a receiver

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Recognize chemical energy is stored in chemical compounds (e.g., energy stored in and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels)</p> | <p><b>Chemical Interactions</b><br/>Resources<br/><b>Diversity of Life</b><br/>Resources<br/><b>Electronics</b><br/>Resources<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Parts 1-3<br/>Resources</p> | <p>Pages 73-77</p> <p>Pages 36-37</p> <p>Pages 6-8, 12-14</p> <p>Pages 142-161<br/>Pages 14-16</p> |

**Concept F:** Energy can change from one form to another within systems, but the total amount remains the same

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <p><i>Scope and Sequence – Physical and Chemical Properties and Changes of Matter</i></p> <p>a. Identify the evidence of different energy transformations (e.g., explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy is released during a chemical reaction)</p> | <p><b>Chemical Interactions</b><br/>Resources<br/><b>Diversity of Life</b><br/>Resources<br/><b>Electronics</b><br/>Resources<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1<br/>Resources</p> | <p>Pages 73-77</p> <p>Pages 36-37</p> <p>Pages 6-8, 12-14</p> <p>Pages 142-150<br/>Pages 14-16</p> |

## STRAND 2

### Properties and Principles of Force and Motion

Not assessed at this level

## STRAND 3

### Characteristics and Interactions of Living Organisms

#### 1. There is a fundamental unity underlying the diversity of all living organisms

##### **Concept A: Organisms have basic needs for survival**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence – Cells and Body Systems</i><br>a. Recognize that most plants and animals require food and oxygen (needed to release the energy from that food) | <b>Chemical Interactions</b><br>Resources<br><b>Diversity of Life</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 4, Part 2<br>Investigation 5, Parts 1-4<br>Resources | Pages 76-77<br><br>Pages 22, 36-37, 51-53, 55-58<br><br>Pages 122-129<br>Pages 142-169<br>Pages 14-21 |

##### **Concept D: Plants and animals have different structures that serve similar functions necessary for the survival of the organism**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Cells and Body Systems</i><br>a. Identify and contrast the structures of plants and animals that serve similar functions (e.g., taking in water and oxygen, support, response to stimuli, obtaining energy, circulation, digestion, excretion, reproduction) | <b>Diversity of Life</b><br>Investigation 5, Parts 1-3<br>Investigation 7, Parts 1-2<br>Investigation 8, Part 1<br>Investigation 9, Part 1<br>Resources<br><br>CD, Database | Pages 151-170<br>Pages 218-229<br>Pages 239-243<br>Pages 273-277<br>Pages 25-26, 31-34, 35-44,<br>46-50, 51-59 |

#### 2. Living organisms carry out life processes in order to survive

##### **Concept A: The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means**

| Grade Level Expectation  | FOSS  | Page(s)  |
|--|---|--|
| <i>Scope and Sequence – Cells and Body Systems</i><br>a. Recognize the cell membrane helps regulate the transfer of materials in and out of the cell<br><br>b. Recognize the function of the chloroplast is photosynthesis | <b>Diversity of Life</b><br>Investigation 4, Part 2<br>Resources<br>CD, Cells and the Ribbon of Life<br><br><b>Diversity of Life</b><br>Resources | Pages 137-141<br>Pages 24-25,<br><br><br>Page 36 |

##### **Concept B: Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth**

| Grade Level Expectation  | FOSS   | Page(s)                                       |
|--|--|---|
| <i>Scope and Sequence – Cells and Body Systems</i><br>a. Recognize photosynthesis is a chemical change with reactants (water and carbon dioxide) and products (energy-rich sugar molecules and oxygen) that takes place in the presence of light | <b>Chemical Interactions</b><br>Resources<br><b>Diversity of Life</b><br>Resources<br><b>Populations &amp; Ecosystems</b><br>Resources | Pages 76-77<br><br>Page 36<br><br>Pages 14-15 |

|  |   |                                      |
|--|---|--------------------------------------|
| and chlorophyll  |   |                                      |
| b. Recognize oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules (Do NOT assess the term cellular respiration) | <b>Diversity of Life</b><br>Resources                               | Pages 22, 52, 57-58                  |
| c. Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism  | <b>Diversity of Life</b><br>Investigation 6, Parts 1-3<br>Resources | Pages 186-202<br>Pages 22, 52, 57-58 |

**Concept C: Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means**

| Grade Level Expectation   | FOSS  | Page(s)                                       |
|---|---|---|
| <i>Scope and Sequence – Cells and Body Systems</i>  |   |   |
| a. Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms (plants, animals)  | <b>Diversity of Life</b><br>Investigation 4, Part 1<br>CD, Cells and the Ribbon of Life           | Pages 137-141                                 |
| b. Illustrate and explain the path water and nutrients take as they move through the transport system of a plant  | <b>Diversity of Life</b><br>Investigation 5, Parts 2-3<br>Investigation 6, Parts 1-3<br>Resources | Pages 165-170<br>Pages 186-202<br>Pages 31-39 |
| c. Explain the interactions between the circulatory and digestive systems as nutrients are processed by the digestive system, passed into the blood stream, and transported in and out of the cell                      | This topic is address in the FOSS 5-6 Grade Food and Nutrition Science Stories.                   |   |
| d. Compare and contrast the processes of mechanical and chemical digestion, and their role in providing materials necessary for survival of the cell and organism   | <b>Diversity of Life</b><br>Inv. 3 Ext. the Experience<br>Resources                               | Pages 123-124<br>Page 25                      |
| e. Identify the importance of the transport and exchange of nutrient and waste molecules to the survival of the cell and organism   | <b>Diversity of Life</b><br>Investigation 6, Parts 1-3<br>Resources                               | Pages 186-203<br>Pages 25-26, 32-34           |
| f. Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere (when oxygen enters the body, passes into the blood stream, and is |   |   |

|   |   |               |
|---|---|---------------|
| transported into the cell; carbon dioxide is transported out of the cell, passes into the blood stream, and exits the body) |   |               |
| g. Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus                | <b>Human Brain and Senses</b><br>Investigation 8, Parts 1-2 | Pages 240-252 |

**Concept F: Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)**

| <b>Grade Level Expectation</b>   | <b>FOSS</b> | <b>Page(s)</b> |
|--|-------------|----------------|
| <i>scope and Sequence – Cells and Body Systems</i><br>a. Predict the response the body may take to maintain internal balance during an environmental change (e.g., shivering when cold, slowing metabolism when food supply decreases or when dehydrated, adrenaline rush when frightened) |             |                |

**Concept G: Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms)**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>                           | <b>Page(s)</b> |
|--|---------------------------------------|----------------|
| <i>Scope and Sequence – Disease</i><br>a. Explain the cause and effect of diseases (e.g., AIDS, cancer, diabetes, hypertension) on the human body                        | <b>Diversity of Life</b><br>Resources | Pages 66-70    |
| b. Relate some common diseases (i.e., cold, influenza, strep throat, dysentery, fungal infections) to the organisms that cause them (bacteria, viruses, protists, fungi) | <b>Diversity of Life</b><br>Resources | Pages 66-70    |
| c. Differentiate between infectious and noninfectious diseases   |                                       |                |
| d. Explain the role of antibiotics and vaccines in the treatment and prevention of diseases  | <b>Diversity of Life</b><br>Resources | Pages 66-70    |

**3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes**

**Concept A: Reproduction can occur asexually or sexually**

| <b>Grade Level Expectation</b>   | <b>FOSS</b>  | <b>Page(s)</b>                |
|--|--|-------------------------------|
| <i>Scope and Sequence – Reproduction and Heredity</i><br>a. Compare and contrast the processes of asexual and sexual reproduction, | <b>Diversity of Life</b><br>Resources<br><b>Populations &amp; Ecosystems</b> | Pages 26, 40-44, 53-54, 61-62 |

|   |  |                              |
|---|--|------------------------------|
| including the type and number of cells involved (one body cell in asexual, two sex cells in sexual), and the number of gene sets (body cell has two sets, sex cells have one set each) passed from parent(s) to offspring | Resources  | Pages 53-54                  |
| b. Identify examples of asexual reproduction (i.e., plants budding, binary fission of single cell organisms)  | <b>Diversity of Life</b><br>Resources                            | Pages 26, 61-62              |
| c. Compare and contrast the reproductive mechanisms of classes of vertebrates (i.e., internal vs. external fertilization)   |  |                              |
| d. Explain how flowering plants reproduce sexually  | <b>Diversity of Life</b><br>Investigation 7, Part 1<br>Resources | Pages 218-223<br>Pages 40-44 |

**Concept C: Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction**

| Grade Level Expectation  | FOSS  | Page(s)            |
|--|---|--------------------|
| <i>Scope and Sequence – Reproduction and Heredity</i>  |   |                    |
| a. Identify chromosomes as cellular structures that occur in pairs that carry hereditary information in units called genes   | <b>Populations &amp; Ecosystems</b><br>Resources  | Pages 46-55        |
| b. Recognize that when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell (Assess only the concept – not the term or process of mitosis)   | <b>Populations &amp; Ecosystems</b><br>Resources<br><b>Diversity of Life</b><br>Resources | Page 53<br>Page 26 |
| c. Recognize that when sexual reproduction occurs, genetic material from both parents is passed on and combined to form the genetic code for the new organism (Assess only the concept – not the term or process of meiosis) | <b>Populations &amp; Ecosystems</b><br>Resources  | Pages 53-54        |

**Concept D: There is heritable variation within every species of organism**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <p><i>Scope and Sequence – Reproduction and Heredity</i></p> <p>a. Recognize that when asexual reproduction occurs, the daughter cell is identical to the parent cell (assuming no change in the parent genes)</p> <p>b. Recognize that when sexual reproduction occurs, the offspring is not identical to either parent due to the combining of the different genetic codes contained in each sex cell</p> | <p><b>Diversity of Life</b><br/>Resources</p> <p><b>Populations &amp; Ecosystems</b><br/>Resources</p> <p><b>Populations &amp; Ecosystems</b><br/>Investigation 9, Parts 1-4<br/>Resources</p> | <p>Page 26, 61-62</p> <p>Page 53</p> <p>Pages 262-291<br/>Pages 53-54</p> |

## STRAND 4

### Changes in Ecosystems and Interactions of Organisms with their Environments

**1. Organisms are interdependent with one another and with their environment**

**Concept D: The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <p><i>Scope and Sequence – Disease</i></p> <p>a. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists, fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation)</p> | <p><b>Diversity of Life</b><br/>Investigation 10, Part 3<br/>Resources</p> <p><b>Populations &amp; Ecosystems</b><br/>Resources</p> | <p>Pages 317-321<br/>Pages 46-50, 60-64, 65-70</p> <p>Pages 64-68</p> |

**2. Matter and energy flow through an ecosystem**

**Concept B: Matter is recycled through an ecosystem**

| Grade Level Expectation  | FOSS | Page(s) |
|--|------|---------|
| <p><i>Scope and Sequence – Cells and Body Systems</i></p> <p>a. Illustrate the oxygen/carbon dioxide cycles</p> <p>b. Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles</p> |      |         |

## STRAND 5

### Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)

**1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures**

**Concept A: The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>   |   |   |
| a. Differentiate between minerals and rocks (which are composed of different kinds of minerals)  | <b>Earth History Resources</b>  | Page 89   |
| b. Describe the distinguishing properties that can be used to classify minerals (i.e., texture, smell, luster, hardness, crystal shape, streak, reaction to magnets and acids) |   |   |
| c. Describe the methods used to identify the distinguishing properties of minerals   |   |   |
| d. Classify rocks as sedimentary, igneous, or metamorphic  | <b>Earth History</b><br>Investigation 4, Parts 5-6<br>Investigation 5, Part 1<br>Investigation 8, Part 1<br>Resources | Pages 150-162<br>Pages 175-178<br>Pages 254-258<br>Pages 42-46, 93-97 |

**2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes**

**Concept B: There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates**

| Grade Level Expectation   | FOSS                           | Page(s)       |
|---|--------------------------------|---------------|
| <i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>  |                                |               |
| a. Explain convection currents are the result of uneven heating inside the mantle resulting in the melting of rock materials, convection of magma, eruption/flow of magma, and movement of crustal plates | <b>Earth History Resources</b> | Pages 100-103 |
| b. Explain how rock layers are affected by the folding, breaking, and uplifting of rock layers due to plate motion  | <b>Earth History Resources</b> | Pages 100-105 |
| c. Describe how the movement of crustal plates can cause earthquakes and volcanic   | <b>Earth History Resources</b> | Pages 100-103 |

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|---|--|--|
| eruptions that can result in mountain building and trench formation |  |  |
|---|--|--|

**Concept C: Continual changes in the Earth’s materials and surface that result from internal and external processes is described by the rock cycle**

| Grade Level Expectation   | FOSS   | Page(s)   |
|---|--|---|
| <i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>  |  |   |
| a. Explain how heating and cooling in the mantle layer leads to the formation of metamorphic rocks and some igneous rocks   | <b>Earth History</b><br>Investigation 8, Part 1<br>Resources   | Pages 254-258<br>Pages 93-97  |
| b. Make inferences about the formation of igneous and metamorphic rocks from their physical properties (e.g., crystal size indicates rate of cooling, air pockets or glassy texture indicate volcanic activity)       | <b>Earth History</b><br>Investigation 8, Parts 1-2   | Pages 254-265   |
| c. Explain and diagram the external and internal processes of the rock cycle (e.g., weathering and erosion, sedimentation, compaction, heating, recrystallization, resurfacing due to forces that drive plate motion) | <b>Earth History</b><br>Investigation 4, Parts 1-6<br>Investigation 5, Parts 1-4<br>Investigation 8, Part 1<br>Resources | Pages 127-162<br>Pages 175-193<br>Pages 254-258<br>Pages 93-97, 100-105 |

**Concept D: Changes in the Earth over time can be inferred through rock and fossil evidence**

| Grade Level Expectation  | FOSS  | Page(s)   |
|--|---|---|
| <i>Scope and Sequence – Rock Cycle and Plate Tectonics</i>   |   |   |
| a. Describe the methods used to estimate geologic time and the age of the Earth (e.g., techniques used to date rocks and rock layers, presence of fossils)   | <b>Earth History</b><br>Investigation 7, Part 1<br>Resources                            | Pages 234-242<br>Pages 76-79, 85-88                           |
| b. Use rock and fossil evidence to make inferences about the age, history, and changing life forms and environment of the Earth (i.e., changes in successive layers of sedimentary rock and the fossils contained within them, similarities between fossils in different geographic locations, similarities between fossils and organisms present today, fossils of organisms) | <b>Earth History</b><br>Investigation 3, Part 4<br>Investigation 5, Part 4<br>Resources | Pages 108-111<br>Pages 188-193<br>Pages 73-75, 81-82, 103-105 |

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| indicating changes in climate, fossils of extinct organisms) |  |  |
|--|--|--|

**STRAND 6**  
**Composition and Structure of the Universe and  
the Motion of the Objects Within It**  
Not assessed at this level

**STRAND 7**  
**Scientific Inquiry**

**1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking**  
**Concept A: Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>scope and Sequence - All Units</i>   |   |   |
| a. Formulate testable questions and hypotheses  | FOSS investigations emphasize formulating questions and using appropriate methods to gather evidence. See for example:<br><b>Chemical Interactions</b><br>Investigation 9, Part 3<br><b>Diversity of Life</b><br>Investigation 8, Part 2<br><b>Earth History</b><br>Investigation 4, Part 3<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3                     | Pages 298-307<br><br>Pages 244-252<br><br>Pages 138-146<br><br>Pages 158-167  |
| b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment | <b>Diversity of Life</b><br>Investigation 8, Part 2<br><b>Force and Motion</b><br>Investigation 2, Part 3<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3   | Pages 278-285<br><br>Pages 89-99<br><br>Pages 158-167   |
| c. Design and conduct a valid experiment  | <b>Chemical Interactions</b><br>Investigation 5, Part 1<br><b>Diversity of Life</b><br>Investigation 8, Part 2<br>Investigation 9, Part 2<br><b>Earth History</b><br>Investigation 8, Part 2<br><b>Human Brain and Senses</b><br>Investigation 7, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 2, Part 1 | Pages 153-158<br><br>Pages 244-252<br>Pages 278-285<br><br>Pages 259-265<br><br>Pages 219-225<br><br>Pages 158-167<br><br>Pages 69-75 |
| d. Evaluate the design of an experiment and make suggestions for  | <b>Chemical Interactions</b><br>Investigation 8, Part 2<br><b>Diversity of Life</b>   | Pages 256-262   |

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|--|--|--|
| reasonable improvements or extensions of an experiment   | Investigation 8, Part 2<br>Investigation 9, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 2, Part 1  | Pages 249-252<br>Pages 278-285<br><br>Pages 158-167<br><br>Pages 69-75   |
| e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models) | FOSS provides opportunity for students to be involved in a variety of data gathering methods. See for example:<br><b>Diversity of Life</b><br>Investigation 3, Part 1-3<br><b>Earth History</b><br>Investigation 2, Parts 3-4<br><b>Force and Motion</b><br>Investigation 7, Parts 1-3<br><b>Planetary Science</b><br>Investigation 4, Parts 2-3<br><b>Populations &amp; Ecosystems</b><br>Investigation 3, Parts 1-3<br><b>Weather and Water</b><br>Investigation 1, Part 1 | Pages 102-122<br><br>Pages 68-74<br><br>Page 256-272<br><br>Pages 126-135<br><br>Pages 90-107<br><br>Pages 43-47 |
| f. Acknowledge there is no fixed procedure called “the scientific method”, but some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations  | FOSS investigations provide the opportunity to teach this concept. See investigations listed above in parts a-e.   |  |

**Concept B: Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations**

| Grade Level Expectation                                | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence - All Units</i>                  |  |   |
| a. Make qualitative observations using the five senses | <b>Chemical Interactions</b><br>Investigation 1, Parts 1-2<br><b>Diversity of Life</b><br>Investigation 9, Part 2<br><b>Earth History</b><br>Investigation 3, Part 1<br><b>Electronics</b><br>Investigation 2, Part 1<br><b>Force and Motion</b><br>Investigation 5, Part 1<br><b>Human Brain and Senses</b><br>Investigation 7, Part 1<br><b>Planetary Science</b><br>Investigation 3, Part 1<br><b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 4<br><b>Weather and Water</b><br>Investigation 5, Parts 2-3 | Pages 41-58<br><br>Pages 278-285<br><br>Pages 88-95<br><br>Pages 89-93<br><br>Pages 169-176<br><br>Pages 210-218<br><br>Pages 89-93<br><br>Pages 161-169<br><br>Pages 163-174 |

|   |  |   |
|---|--|---|
| <p>b. Determine the appropriate tools and techniques to collect data</p>  | <p><b>Chemical Interactions</b><br/>Investigation 5, Part 1<br/><b>Diversity of Life</b><br/>Investigation 3, Parts 1-3<br/>Investigation 9, Part 2<br/><b>Force and Motion</b><br/>Investigation 7, Part 1<br/><b>Planetary Science</b><br/>Investigation 5, Parts 2-3<br/><b>Weather and Water</b><br/>Investigation 5, Part 1</p>   | <p>Pages 153-158<br/>Pages 102-122<br/>Pages 278-285<br/>Pages 256-261<br/>Pages 158-167<br/>Pages 152-162</p>  |
| <p>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)</p>             | <p><b>Chemical Interactions</b><br/>Investigation 3, Parts 1-2<br/><b>Diversity of Life</b><br/>Investigation 3, Parts 1-3<br/><b>Earth History</b><br/>Investigation 4, Part 2<br/><b>Electronics</b><br/>Investigation 3, Parts 1-4<br/><b>Force and Motion</b><br/>Investigation 2, Part 3<br/><b>Human Brain and Senses</b><br/>Investigation 4, Parts 1-3<br/><b>Planetary Science</b><br/>Investigation 8. Parts 3-4<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1<br/><b>Weather and Water</b><br/>Investigation 4, Parts 1-2</p> | <p>Pages 92-107<br/>Pages 102-122<br/>Pages 132-137<br/>Pages 119-135<br/>Pages 89-99<br/>Pages 120-143<br/>Pages 260-270<br/>Pages 142-150<br/>Pages 121-139</p> |
| <p>d) Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second</p> | <p><b>Chemical Interactions</b><br/>Investigation 5, Part 1<br/><b>Diversity of Life</b><br/>Investigation 6, Part 1<br/><b>Earth History</b><br/>Investigation 6, Parts 1, 3<br/><b>Force and Motion</b><br/>Investigation 2, Part 3<br/><b>Planetary Science</b><br/>Investigation 8, Parts 3-4<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1<br/><b>Weather and Water</b><br/>Investigation 5, Part 1</p>   | <p>Pages 153-158<br/>Pages 186-192<br/>Pages 89-99<br/>Pages 152-162<br/>Pages 260-270<br/>Pages 142-150<br/>Pages 205-208, 215-219</p>                           |
| <p>e) Compare amounts/measurements</p>  | <p><b>Chemical Interactions</b><br/>Investigation 8, Parts 2-3<br/><b>Diversity of Life</b><br/>Investigation 6, Part 1<br/><b>Force and Motion</b><br/>Investigation 2, Part 3<br/><b>Planetary Science</b><br/>Investigation 8. Parts 3-4<br/><b>Populations &amp; Ecosystems</b><br/>Investigation 5, Part 1<br/><b>Weather and Water</b><br/>Investigation 5, Part 1</p>   | <p>Pages 256-268<br/>Pages 186-192<br/>Pages 89-99<br/>Pages 260-270<br/>Pages 142-150<br/>Pages 152-162</p>  |
| <p>f) Judge whether</p>   | <p><b>Diversity of Life</b></p>  |   |

|   |   |  |
|---|---|--|
| measurements and computation of quantities are reasonable | Investigation 6, Part 1<br><b>Force and Motion</b><br>Investigation 2, Part 3<br><b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3<br><b>Planetary Science</b><br>Investigation 8, Parts 3-4<br><b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1<br><b>Weather and Water</b><br>Investigation 5, Part 1 | Pages 186-192<br><br>Pages 89-99<br><br>Pages 120-143<br><br>Pages 260-270<br><br>Pages 142-150<br><br>Pages 152-162 |
| g. Calculate the range and average/mean of a set of data  | <b>Chemical Interactions</b><br>Investigation 6<br><b>Electronics</b><br>Inv. 2, Ext. the Experience<br><b>Force and Motion</b><br>Investigation 2, Part 3  | Pages 178-187<br><br>Page 109<br><br>Pages 89-99   |

**Concept C: Evidence is used to formulate explanations**

| Grade Level Expectation  | FOSS   | Page(s)   |
|--|--|---|
| <i>Scope and Sequence - All Units</i>  |  |   |
| a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)        | FOSS investigations emphasize that students use evidence to make explanations. See for example:<br><b>Chemical Interactions</b><br>Investigation 10, Part 2<br><b>Diversity of Life</b><br>Investigation 6, Part 1<br><b>Earth History</b><br>Investigation 8, Part 2<br><b>Electronics</b><br>Investigation 6, Part 4<br><b>Force and Motion</b><br>Investigation 2, Part 3<br><b>Human Brain and Senses</b><br>Investigation 7, Part 2<br><b>Planetary Science</b><br>Investigation 5, Part 2-3<br><b>Populations &amp; Ecosystems</b><br>Investigation 6, Part 2<br><b>Weather and Water</b><br>Investigation 4, Part 1 | Pages 330-336<br><br>Pages 186-192<br><br>Pages 259-265<br><br>Pages 201-208<br><br>Pages 89-99<br><br>Pages 219-225<br><br>Pages 158-167<br><br>Pages 187-190<br><br>Pages 121-139 |
| b. Use data as support for observed patterns and relationships, and to make predictions to be tested | <b>Chemical Interactions</b><br>Investigation 8, Part 3<br><b>Electronics</b><br>Investigation 2, Part 1<br><b>Force and Motion</b><br>Investigation 7, Part 2-3<br><b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3<br><b>Planetary Science</b><br>Investigation 5, Part 2-3<br><b>Populations &amp; Ecosystems</b><br>Investigation 6, Part 2<br><b>Weather and Water</b><br>Investigation 3, Part 1  | Pages 263-268<br><br>Pages 89-93<br><br>Pages 262-272<br><br>Pages 120-143<br><br>Pages 158-167<br><br>Pages 187-190<br><br>Pages 93-96   |

|  |  |               |
|--|--|---------------|
| c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions) | Investigation 5, Part 1  | Pages 152-162 |
|  | <b>Chemical Interactions</b><br>Investigation 8, Part 2        | Pages 256-262 |
|  | <b>Diversity of Life</b><br>Investigation 6, Part 1            | Pages 186-192 |
|  | <b>Electronics</b><br>Investigation 6, Part 4                  | Pages 201-208 |
|  | <b>Human Brain and Senses</b><br>Investigation 4, Parts 1-3    | Pages 120-143 |
|  | <b>Populations &amp; Ecosystems</b><br>Investigation 5, Part 1 | Pages 142-150 |

**Concept D: Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)**

| Grade Level Expectation   | FOSS  | Page(s)  |
|---|---|--|
| <i>Scope and Sequence - All Units</i>   |   |  |
| a. Evaluate the reasonableness of an explanation (conclusion)   | FOSS investigations provide the opportunity to teach these expectations. See for example:<br><b>Diversity of Life</b><br>Investigation 9, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 3, Parts 1, 3 | Pages 278-285<br>Pages 158-167<br>Pages 93-96, 103-110 |
| b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories) | <b>Force and Motion</b><br>Investigation 7, Part 2<br><b>Planetary Science</b><br>Investigation 5, Parts 2-3<br><b>Weather and Water</b><br>Investigation 3, Parts 1, 3   | Pages 262-266<br>Pages 158-167<br>Pages 93-96, 103-110 |

**Concept E: The nature of science relies upon communication of results and justification of explanations**

| Grade Level Expectation   | FOSS  | Page(s)   |
|---|---|---|
| <i>Scope and Sequence - All Units</i>   |   |   |
| a. Communicate the procedures and results of investigations and explanations through:<br>oral presentations<br>drawings and maps<br>data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)<br>graphs (bar, single line, pictograph)<br>equations and writings | <b>Diversity of Life</b><br>Investigation 9, Part 3<br><b>Earth History</b><br>Investigation 8, Part 4<br><b>Electronics</b><br>Investigation 3, Parts 1-3<br><b>Force and Motion</b><br>Investigation 3, Parts 1-2<br><b>Human Brain and Senses</b><br>Investigation 7, Parts 1-3<br><b>Planetary Science</b><br>Investigation 10, Part 3<br><b>Populations &amp; Ecosystems</b><br>Investigation 6, Parts 1-3<br><b>Weather and Water</b><br>Inv. 9, Ext. the Exp. #9 | Pages 286-289<br>Pages 270-274<br>Pages 119-132<br>Pages 111-123<br>Pages 210-230<br>Pages 322-324<br>Pages 179-197<br>Page 320 |

## STRAND 8

### Impact of Science, Technology and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs

**Concept A:** Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all

| Grade Level Expectation  | FOSS  | Page(s)       |
|--|---|---------------|
| <i>Scope and Sequence - All Units</i><br>a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers) | <b>Weather and Water</b><br>Investigation 6, Part 5 | Pages 214-220 |

**Concept B:** Advances in technology often result in improved data collection and an increase in scientific information

| Grade Level Expectation  | FOSS  | Page(s)                        |
|--|---|--------------------------------|
| <i>Scope and Sequence - All Units</i><br>a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity) | <b>Planetary Science</b><br>Resources<br><b>Human Brain and Senses</b><br>Resources | Pages 90-95, 99<br><br>Page 49 |

**Concept C:** Technological solutions to problems often have drawbacks as well as benefits

| Grade Level Expectation  | FOSS                              | Page(s)     |
|--|-----------------------------------|-------------|
| <i>Scope and Sequence - All Units</i><br>a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble | <b>Earth History</b><br>Resources | Pages 64-67 |

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|--|--|--|
| telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally)) |  |  |
|--|--|--|

**2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time**

**Concept A: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation   | FOSS   | Page(s)  |
|---|--|--|
| <i>Scope and Sequence - All Units</i>   |  |  |
| a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally) | <b>Earth History</b><br>Investigation 2, Part 1<br>Resources<br><b>Force and Motion</b><br>Investigation 7, Part 3<br>Resources<br><b>Populations &amp; Ecosystems</b><br>Investigation 9, Part 2<br>Resources | Pages 60-63<br>Pages 83-85<br><br>Pages 267-272<br>Pages 50-56<br><br>Pages 267-273<br>Pages 46-52 |

**Concept B: People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations**

| Grade Level Expectation  | FOSS                                 | Page(s)     |
|--|--------------------------------------|-------------|
| <i>Scope and Sequence - All Units</i>  |                                      |             |
| a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton) | <b>Force and Motion</b><br>Resources | Pages 50-52 |
| b. Recognize explanations have changed over time as a result of new evidence   | <b>Force and Motion</b><br>Resources | Pages 50-52 |

**3. Science and technology affect, and are affected by, society**

**Concept B: Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology**

| Grade Level Expectation         | FOSS | Page(s) |
|---------------------------------|------|---------|
| <i>Scope and Sequence - All</i> |      |         |

