

## Unit 4—Exploring Ecosystems (FOSS® Environments)

### How are plants and animals in an ecosystem connected?

**Major Understandings:** *quoted from NY State Performance Indicators*

**(Note: Correlation is provided at the level of FOSS “Investigation” All “Parts” and “Steps” of an investigation must be completed to meet the standard.)**

#### **LE 3.2 Describe factors responsible for competition within species and the significance of that competition.**

3.2a In all environments, organisms with similar needs may compete with one another for resources.

#### **LE 5.1 Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium.**

5.1c All organisms require energy to survive. The amount of energy needed and the method for obtaining this energy vary among cells. Some cells use oxygen to release the energy stored in food.

5.1d The methods for obtaining nutrients vary among organisms. Producers, such as green plants, use light energy to make their food. Consumers, such as animals, take in energy-rich foods.

5.1e Herbivores obtain energy from plants. Carnivores obtain energy from animals. Omnivores obtain energy from both plants and animals. Decomposers, such as bacteria and fungi, obtain energy by consuming wastes and / or dead organisms.

#### **LE 5.2 Describe the importance of major nutrients, vitamins, and minerals in maintaining health and promoting growth, and explain the need for a constant input of energy for living organisms.**

5.2a Food provides molecules that serve as fuel and building material for all organisms. All living things, including plants, must release energy from their food, using it to carry on their life processes.

#### **LE 6.1 Describe the flow of energy and matter through food chains and webs.**

6.1a Energy flows through ecosystems in one direction, usually from the Sun, through producers to consumers and then to decomposers. This process may be visualized with food chains and energy pyramids.

6.1b Food webs identify feeding relationships among producers, consumers, and decomposers in an ecosystem.

#### **LE 6.2 Provide evidence that green plants make food and explain the significance of this process to other organisms.**

6.2a Photosynthesis is carried on by green plants and other organisms containing chlorophyll. In this process, the Sun’s energy is converted into and stored as chemical energy in the form of sugar. The quantity of sugar molecules increases in green plants during photosynthesis in the presence of sunlight.

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**LE 7.1 Describe how living things, including humans, depend upon the living and nonliving environment for their survival.**

7.1a A population consists of all individuals of a species that are found together at a given place and time. Populations living in one place form a community. The community and the physical factors with which it interacts compose an ecosystem.

**LE 7.2 Describe the effects of environmental changes on humans and other population.**

7.2b The environment may be altered through the activities of organisms. Alterations are sometimes abrupt. Some species may replace others over time, resulting in long-term gradual changes (ecological succession.)

7.2c Overpopulation by any species impacts the environment due to the increased use of resources. Human activities can bring about environmental degradation through resource acquisition, urban growth, land-use decisions, waste disposal, etc.

7.2d Since the Industrial Revolution, human activities have resulted in major pollution of air, water and soil. Pollution has cumulative ecological effects such as acid rain, global warming, or ozone depletion. The survival of living things on our planet depends on the conservation and protection of Earth's resources.

**General Skills:** quoted from the NYS Core Curriculum *(Note: Correlation is provided at the "Investigation" level.)*

1. Follow safety procedures in the classroom and laboratory.
2. Safely and accurately use the following measurement tools: metric ruler, balance, graduated cylinder, thermometer.
3. Use appropriate units for measured or calculated values.
4. Recognize and analyze patterns and trends.
5. Classify objects according to an established scheme and a student-generated scheme.
8. Identify cause-and-effect relationships.
9. Use indicators and interpret results.

**Living Environment Skills:** quoted from the NYS Core Curriculum *(Note: Correlation is provided at the "Investigation" level.)*

6. Classify living things according to a student-generated scheme and an established scheme.
7. Interpret and/or illustrate the energy flow in a food chain, energy pyramid, or food web.

**Consult the FOSS<sup>®</sup> Environments Teacher Guide Materials Folio for materials not provided in the kit. Review the notes below :**

**Plan to order Living Materials:**

*The FOSS<sup>®</sup> Program endorses the National Science Teachers Association Guidelines for Responsible Use of Animals in the Classroom as they apply to elementary classrooms. For information visit the link:*

<http://lhsfoss.org/fossweb/teachers/materials/plantanimal/ethics.html>

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**Consult FOSS® Environments Teacher Guide – Materials, Planning for Live Organisms, p. 4**

- Locate Live Organism Coupons shipped to your school with the kits.– Part Nos. 270-4151 (50 darkling beetles, 50 isopods); 270-4162 (20 goldfish and 12 Elodea plants); 270-4349 (50 Gammarus, 50 pond snails, 1 jar Duckweed)

*Note: All cards for FOSS® kits used in Units 3 & 4 were likely shipped in ONE large envelope that accompanied the kit boxes. Grade 5 cards need to be sorted by module investigation.*

- Plan for seeds (included in kit) for Investigation 1. See TG, Materials, p. 4 and the Investigation 1 folio.
- Plan to order organisms so they arrive the week before you begin the investigation. Allow 4 weeks for delivery.

**Suggested timeline:**

Investigation 1: Seeds included in kit – no organisms to order.

Investigation 2: **4 weeks before Week 2, Lesson 7, Investigation 2: Order beetles and isopods.**

Investigation 3: Seeds included in kit – no organisms to order.

Investigation 4: **4 weeks before Week 5, Lesson 20 Investigation 4: Order goldfish, Elodea;**

**4 weeks before Week 7, Lesson 25: Order Gammarus, pond snails, Lemna (duckweed).**

Investigation 5: Brine Shrimp Eggs included in kit – no organisms to order - check the viability of the eggs in your local water (or bottled water) at least one week before starting the Investigation.

Investigation 6: Seeds included in kit – no organisms to order.

- Plan for arrival and care of terrestrial and aquatic organisms, see TG, Materials p. 4-5; or follow the link <http://www.fossweb.com/modules3-6/Environments/index.html>
- *Suggestion: When ordering multiple sets of organisms for different classrooms, consider varying the shipment arrival dates. Should problems arise with a shipment, the second shipment will be on its way while you notify Delta Education Customer Service of your problem.*
- **IMPORTANT!** – Retain the “Living Materials Warranty Information” brochure & Packing Slip that is shipped with your order for information on unpacking your order, and resolving problems of shortages or damage. Claims must be submitted within 48 hours of receipt of your order.
- **REMEMBER!** – Do not release any living organisms into your local environment. Any non-native organism (plant or animal) has the potential to destroy the ecological balance of your local environment.

**OBTAIN (4) 8 liter bags of POTTING SOIL:**

You will need 1 bag for Investigation 1; 1 bag for Investigation 2; 2 bags for Investigation 3. It may be reused next year.

**DOWNLOAD THE MATERIAL SAFETY DATA SHEETS for this module at:**

[http://www.delta-education.com/science/foss/foss\\_msds.aspx](http://www.delta-education.com/science/foss/foss_msds.aspx)

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<b>WEEK 1</b>	<p><b>Lesson 1 (45 min)</b></p> <p><b>Objective(s):</b> Survey / Pre-assessment</p> <ul style="list-style-type: none"> <li>• Environment is everything that surrounds and influences an organism.</li> <li>• An environmental factor is one part of an environment. It can be living or nonliving.</li> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods and beetles prefer dark environments.</li> <li>• Every organism has a range of tolerance for each factor in its environment.</li> <li>• Organisms have specific requirements for successful growth, development and reproduction.</li> <li>• Within a range of tolerance, there are optimum conditions that produce maximum growth.</li> <li>• Aquatic environments include living and nonliving factors.</li> <li>• Water and temperature are two nonliving environmental factors to consider when setting up goldfish in an aquarium.</li> <li>• Carbon dioxide produced by aquatic organisms changes the acidity of the water.</li> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• Brine shrimp are crustaceans that live in marine or salt-pond environments.</li> <li>• Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.</li> <li>• By altering the environment to optimum salt concentration, brine shrimp eggs that were once dormant can hatch.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> <li>• Gathering and organizing data.</li> <li>• Interpreting data and building explanations.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 5, 8, 9</li> <li>• Living Environment Skills: 6, 7</li> </ul>	
	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Read the Introduction and Overview sections of your FOSS Environments Teacher Guide.</li> <li>– Note: Administration of the Survey should be a few days BEFORE the start of the unit.</li> <li>– Teacher Guide, Benchmark Assessment Folio, pp. 1-21, 60</li> <li>– Download optional tool: Benchmark and I-Check Assessment coding sheets at <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a></li> </ul>	<p><b>Investigation/ Activity</b></p> <ul style="list-style-type: none"> <li>– Benchmark Assessment Packet, Survey/Post-test pages 1-5</li> </ul>	<p><b>Homework/ Extra Practice</b></p>

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<b>WEEK 1 (continued)</b>	<p><b>Advanced Planning/Notes to Teachers (continued)</b></p> <ul style="list-style-type: none"> <li>– Kit preparation: see Teacher Guide, Materials, pp. 1-7 and Teacher Preparation Video or DVD (or view at <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a>)</li> <li>– Note: see Teacher Guide, Materials, p 3 for Materials Supplied by the Teacher and Measurement Kit Items from the Environments Tool Kit.</li> <li>– Note: see Teacher Guide, Materials, pp. 4-5. <b>Planning for Live Organisms.</b></li> <li>– Refer to Teacher Guide, Materials, pp. 6-7 <b>Preparing the Kit for Your Classroom.</b></li> </ul>	<p><b>Investigation/Activity (continued)</b></p> <ul style="list-style-type: none"> <li>– Letter to Parents, Teacher Sheet No. 1</li> </ul>	
	<p><b>NOTE:</b> Informally introduce the vocabulary: individual, population, community and ecosystem when appropriate throughout Investigations 1, 2, 3, 4, 5. Formally define these terms by Investigation 4, entering them in the Word Bank and Student Notebook Glossary.</p>		

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	<p><b>Lesson 2 (45 min) Investigation 1, Day 1</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Environment is everything that surrounds and influences an organism.</li> <li>• An environmental factor is one part of an environment. It can be living or nonliving.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
WEEK 1 (continued)	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, Part 1: <i>Setting Up Terrariums</i>, Materials and Getting Ready, pp. 8-11</li> <li>– Teacher Guide Science Stories folio, pp. 1-3</li> <li>– Teacher Guide Assessment folio, pp. 1-6 <b>and</b> pp. 31-32</li> <li>– Note: The <b>Benchmark Assessment</b> replaces the <i>Summative Assessment</i>.</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, to write questions to a scientist, for teaching tips, and other websites to support teaching Environments.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 1: <i>Terrestrial Environments</i> Part 1: <i>Setting Up Terrariums</i>, # 1-19</li> <li>– Teacher Guide pages 12-14</li> <li>– Investigation Duplication Master: Teacher Sheet No. 1</li> <li>– Investigation Duplication Master: Student Sheet No. 2, 3</li> <li>– Assessment - Assessment Chart No. 1 for Investigation 1, Part 1 – Teacher Observation – Mapping Terrariums Assessment folio, p 6, Teacher Observation Scoring Guide</li> <li>– Prepare to read FOSS Science Stories: <i>Amazon Rainforest Journal</i>, pages 1-8. The estimated time for this reading is <b>40 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

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	<p><b>Lesson 3 (45 min) Investigation 1, Day 2</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Environment is everything that surrounds and influences an organism.</li> <li>An environmental factor is one part of an environment. It can be living or nonliving.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>LE 7.1a, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 8, 9</li> </ul>	
WEEK 1 (continued)	<p><b>Advanced Planning/ Notes to Teacher</b></p> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, pp. 1-7</li> <li>Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, Part 1: <i>Setting Up Terrariums</i>, Materials and Getting Ready, pp. 8-11</li> <li>Teacher Guide Science Stories folio, pp. 1-3</li> <li>Teacher Guide Assessment folio, pp. 1-6 <b>and</b> pp. 31-32</li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Investigation 1: <i>Terrestrial Environments</i> Part 1: <i>Setting Up Terrariums</i>, # 20-22</li> <li>Teacher Guide page 15</li> <li>Investigation Duplication Master: Teacher Sheet No. 1</li> <li>Investigation Duplication Master: Student Sheet No. 2, 3</li> <li>Assessment - Assessment Chart No. 1 for Investigation 1, Part 1 – Teacher Observation – Mapping Terrariums Assessment folio, p. 6, Teacher Observation Scoring Guide</li> <li>Read FOSS Science Stories: <i>Amazon Rainforest Journal</i>, pages 1-8. The estimated time for this reading is <b>40 minutes</b>.</li> </ul>	<p><b>Homework/Extra Practice</b></p> <p>Home/School Connection, Student Sheet No. 29</p>
<p><b>Note:</b> There is no prescribed format for recording of student data in Part 2: Recording Changes. For support in developing student notebooks, visit <a href="http://www.fossweb.com/nyc">www.fossweb.com/nyc</a> and download the FOSS Science Notebook Folio available through the Teacher Resources link: <a href="http://www.fossweb.com/NYC/protected/pdfs/nyc_notebooks/ScienceNotebookFolio.pdf">http://www.fossweb.com/NYC/protected/pdfs/nyc_notebooks/ScienceNotebookFolio.pdf</a> The username <u>and</u> password are “fossnyc” or “FOSSNYC”.</p> <p>“After the Story” questions found in the Science Stories Folio may be incorporated into student notebooks as reflection after the readings.</p>			

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<b>WEEK 1 (continued)</b>	<p><b>Lesson 4</b> (45 min and 10 min every 2-3 days for 2-3 weeks)  <b>Investigation 1, Day 3</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, Part 2: <i>Recording Changes</i>, Materials and Getting Ready, pp. 16-17</li> <li>– Teacher Guide Science Stories folio, pp. 4-5</li> <li>– Teacher Guide Assessment folio, p. 7</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 1: <i>Terrestrial Environments</i> Part 2: <i>Recording Changes</i>, # 1-2</li> <li>– Teacher Guide page 18</li> <li>– Investigation Duplication Master: Student Sheet No. 5, 6</li> <li>– Assessment - Assessment Chart No. 1 for Investigation 1, Part 2 – Response Sheet – Terrestrial Environments Assessment folio, p. 7, Response Sheet Scoring Guide</li> <li>– Prepare to read FOSS Science Stories: <i>Terrestrial Environments Around the World</i>, pages 9-17. The estimated time for this reading is <b>50 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

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	<p><b>Lesson 5 (45 min) Investigation 1, Day 7</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
<b>WEEK 2</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, Part 2: <i>Recording Changes</i>, Materials and Getting Ready, pp. 16-17</li> <li>– Teacher Guide Science Stories folio, pp. 4-5</li> <li>– Teacher Guide Assessment folio, p. 7</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 1: <i>Terrestrial Environments</i> Part 2: <i>Recording Changes</i>, # 1-2, 4-7</li> <li>– Teacher Guide pages 18-19</li> <li>– Investigation Duplication Master: Student Sheet No. 5, 6</li> <li>– Assessment - Assessment Chart No. 1 for Investigation 1, Part 2 – Response Sheet – <i>Terrestrial Environments</i> Assessment folio, p. 7, Response Sheet Scoring Guide</li> <li>– Read FOSS Science Stories: <i>Terrestrial Environments Around the World</i>, pages 9-17. The estimated time for this reading is <b>50 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Math Extension, Student Sheet No. 23</p>

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<b>WEEK 2 (continued)</b>	<b>Lesson 6 (45 min) Investigation 1, Day 8</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>Environments change over time.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>LE 7.1a, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, pp. 1-7</li> <li>Teacher Guide Inv. 1: <i>Terrestrial Environments</i>, Part 2: <i>Recording Changes</i>, Materials and Getting Ready, pp. 16-17</li> <li>Teacher Guide Science Stories folio, pp. 4-5</li> <li>Teacher Guide Assessment folio, p. 7</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>Investigation 1: <i>Terrestrial Environments</i> Part 2: <i>Recording Changes</i>, # 1-2, 3, 4-7</li> <li>Teacher Guide pages 18-19</li> <li>Investigation Duplication Master: Student Sheet No. 5, 6</li> <li>Assessment - Assessment Chart No. 1 for Investigation 1, Part 2 – Response Sheet – Terrestrial Environments Assessment folio, p. 7, Response Sheet Scoring Guide</li> <li>Read FOSS Science Stories: <i>Terrestrial Environments Around the World</i>, pages 9-17. The estimated time for this reading is <b>50 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>  Response Sheet: Terrestrial Environments  <b>Note:</b> You may wish to delay this Response Sheet assignment if the students have not had opportunities to make concrete observations of changes in their terrariums.

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<b>WEEK 2 (continued)</b>	<b>Lesson 7 (45 min) Investigation 1, Day 9</b> <b>Objective(s):</b> Designing an investigation involves controlling the variables so that the effect of one factor can be observed.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 1: <i>Making Animal Runways</i>, Materials and Getting Ready, pp. 10-12</li> <li>– Teacher Guide Science Stories folio, pp. 6-7</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, to write questions to a scientist, for teaching tips, and other websites to support teaching Environments.</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 1: <i>Making Animal Runways</i>, # 1-9</li> <li>– Teacher Guide pages 13-14</li> <li>– Investigation Duplication Master: Student Sheet No. 5</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 1 – Teacher Observation – Environmental Factors</li> <li>– Prepare to read FOSS Science Stories: <i>Beetles</i>, pages 18-20. The estimated time for this reading is <b>40 minutes</b>.</li> </ul>	

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<b>WEEK 2 (continued)</b>	<b>Lesson 8 (45 min) Investigation 1, Day 10</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods prefer moist environments; beetles prefer dry environments.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 1: <i>Making Animal Runways</i>, Materials and Getting Ready, pp. 10-12</li> <li>– Teacher Guide Science Stories folio, pp. 6-7</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 1: <i>Terrestrial Environments</i> Part 2: <i>Recording Changes</i>, # 1-2</li> <li>– Teacher Guide pages 18-19</li> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 1: <i>Making Animal Runways</i>, # 10-12</li> <li>– Teacher Guide page 15</li> <li>– Investigation Duplication Master: Student Sheet No. 5</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 1 – Teacher Observation – Environmental Factors</li> <li>– Read FOSS Science Stories: <i>Beetles</i>, pages 18-20. The estimated time for this reading is <b>40 minutes</b>.</li> </ul>		<b>Homework/Extra Practice</b>  Math Extension, Student Sheet No. 24

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	<p><b>Lesson 9 (45 min) Investigation 1, Day 11</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods prefer moist environments; beetles prefer dry environments.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
<b>WEEK 3</b>	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 2: <i>Responding to Moisture</i>, Materials and Getting Ready, pp. 16-17</li> <li>– Teacher Guide Science Stories folio, pp. 8-9</li> <li>– Teacher Guide Assessment folio, p. 8</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 2: <i>Responding to Moisture</i>, # 1-11</li> <li>– Teacher Guide pages 18-20</li> <li>– Investigation Duplication Master: Student Sheet No. 6, 7</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 2 – Response Sheet – Bugs and Beetles Assessment folio, p. 8</li> <li>– Prepare to read FOSS Science Stories: <i>The Darkling Beetle</i>, page 21. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 3 (continued)</b>	<b>Lesson 10 (45 min) Investigation 1, Day 12</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods prefer moist environments; beetles prefer dry environments.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 2: <i>Responding to Moisture</i>, Materials and Getting Ready, pp. 16-17</li> <li>– Teacher Guide Science Stories folio, pp. 8-9</li> <li>– Teacher Guide Assessment folio, p. 8</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 2: <i>Responding to Moisture</i>, # 12-16</li> <li>– Teacher Guide pages 20-21</li> <li>– Investigation Duplication Master: Student Sheet No. 6, 7</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 2 – Response Sheet – Bugs and Beetles Assessment folio, p. 8</li> <li>– Read FOSS Science Stories: <i>The Darkling Beetle</i>, page 21. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>  Home/School Connection, Student Sheet No. 30

## Grade 5

<b>WEEK 3 (continued)</b>	<b>Lesson 11 (45 min) Investigation 1, Day 13</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods and beetles prefer dark environments.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 3: <i>Responding to Light</i>, Materials and Getting Ready, pp. 22-23</li> <li>– Teacher Guide Science Stories folio, pp. 10-11</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 1: <i>Terrestrial Environments</i> Part 2: <i>Recording Changes</i>, # 1-2</li> <li>– Teacher Guide pages 18-19</li> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 3: <i>Responding to Light</i>, # 1-8</li> <li>– Teacher Guide pages 22-25</li> <li>– Investigation Duplication Master: Student Sheet No. 6</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 3 – Teacher Observation – Controls Variables</li> <li>– Prepare to read FOSS Science Stories: <i>Isopods</i>, page 22. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 3 (continued)</b>	<b>Lesson 12 (45 min) Investigation 1, Day 14</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods and beetles prefer dark environments.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 3: <i>Responding to Light</i>, Materials and Getting Ready, pp. 22-23</li> <li>– Teacher Guide Science Stories folio, pp. 10-11</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 3: <i>Responding to Light</i>, # 9-11</li> <li>– Teacher Guide page 25</li> <li>– Investigation Duplication Master: Student Sheet No. 6</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 3 – Teacher Observation – Controls Variables</li> <li>– Read FOSS Science Stories: <i>Isopods</i>, page 22. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 4</b>	<b>Lesson 13 (45 min) Investigation 1, Day 15</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods prefer moist environments; beetles prefer dry environments.</li> <li>• Isopods and beetles prefer dark environments.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 4: <i>Designing an Animal Investigation</i>, Materials and Getting Ready, pp. 26-27</li> <li>– Teacher Guide Assessment folio, p. 9</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 4: <i>Designing an Animal Investigation</i>, # 1-6</li> <li>– Teacher Guide pages 28-29</li> <li>– Investigation Duplication Master: Student Sheet No. 6</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 4 – Teacher Observation – Designing an Investigation, Student Sheet – Animal Investigations – Draws Conclusions Assessment folio, p. 9</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 4 (continued)</b>	<b>Lesson 14 (45 min) Investigation 1, Day 16</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods prefer moist environments; beetles prefer dry environments.</li> <li>• Isopods and beetles prefer dark environments.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, pp. 1-9</li> <li>– Teacher Guide Inv. 2: <i>Bugs and Beetles</i>, Part 4: <i>Designing an Animal Investigation</i>, Materials and Getting Ready, pp. 26-27</li> <li>– Teacher Guide Assessment folio, p. 9</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 1: <i>Terrestrial Environments</i> Part 2: <i>Recording Changes</i>, # 1-2</li> <li>– Teacher Guide pages 18-19</li> <li>– Investigation 2: <i>Bugs and Beetles</i> Part 4: <i>Designing an Animal Investigation</i>, # 7-10</li> <li>– Teacher Guide pages 29-30</li> <li>– Investigation Duplication Master: Student Sheet No. 6</li> <li>– Assessment - Assessment Chart No. 2 for Investigation 2, Part 4 – Teacher Observation – Designing and Investigation Student Sheet – Animal Investigations – Draws Conclusions Assessment folio, p. 9</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 4 (continued)</b>	<b>Lesson 15 (45 min) Investigation 3, Day 1</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Every organism has a range of tolerance for each factor in its environment.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: <i>Water Tolerance</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 2: <i>Water Tolerance</i>, Part 1: <i>Setting Up the Experiment</i>, Materials and Getting Ready, pp. 8-10</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, to write questions to a scientist, for teaching tips, and other websites to support teaching Environments</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 3: <i>Water Tolerance</i> Part 1: <i>Setting Up the Experiment</i>, # 1-14</li> <li>– Teacher Guide pages 11-13</li> <li>– Investigation Duplication Master: Teacher Sheet No. 8</li> <li>– Investigation Duplication Master: Student Sheet No. 9</li> <li>– Assessment - Assessment Chart for Investigation 3, Part 1 – Teacher Observation – informal notes</li> </ul>	<b>Homework/Extra Practice</b>  Math Extension, Student Sheet No. 25

## Grade 5

<b>WEEK 4 (continued)</b>	<b>Lesson 16 (45 min) Investigation 3, Day 2</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Environment is everything that surrounds and influences an organism.</li> <li>• An environmental factor is one part of an environment. It can be living or nonliving.</li> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods and beetles prefer dark environments.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide, Benchmark Assessment Folio, pp. 22-31, 60</li> <li>– Plan Assessment Review time with class after teacher assessment coding</li> </ul>	<b>Investigation/Activity</b> Benchmark Assessment Packet, Investigation 1, I-Check, pages 1-5	<b>Homework/Extra Practice</b>

## Grade 5

	<p><b>Lesson 17 (45 min) Investigation 3, Day 6</b></p> <p><b>Objective(s):</b> Organisms have specific requirements for successful growth, development and reproduction.</p>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
<b>WEEK 5</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: <i>Water Tolerance</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 2: <i>Water Tolerance</i>, Part 2: <i>Observing Plants at 5 and 8 days</i>, Materials and Getting Ready, p. 14</li> <li>– Teacher Guide Science Stories folio, pp. 12-13</li> <li>– Teacher Guide Assessment folio, p. 10</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: <i>Water Tolerance</i> Part 2: <i>Observing Plants at 5 and 8 Days</i>, # 1- 4</li> <li>– Teacher Guide pages 16-17</li> <li>– Investigation Duplication Master: Student Sheet No. 10, 11</li> <li>– Assessment - Assessment Chart for Investigation 3, Part 2 – Response Sheet – Water Tolerance Assessment folio, p 10, Response Sheet Scoring Guide</li> <li>– Prepare to read FOSS Science Stories: <i>Auntie’s Plants</i>, pages 23-26. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 5 (continued)</b>	<b>Lesson 18 (45 min) Investigation 3, Day 7</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Environment is everything that surrounds and influences an organism.</li> <li>• An environmental factor is one part of an environment. It can be living or nonliving.</li> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods and beetles prefer dark environments.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/Notes to Teachers</b> Teacher Guide, Benchmark Assessment Folio, pp. 22-31, 60	<b>Investigation/Activity</b> Benchmark Assessment Review, Investigation 1-2, I-Check, pages 1-5	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 5 (continued)</b>	<b>Lesson 19 (45 min) Investigation 3, Day 8</b> <b>Objective(s):</b> Organisms have specific requirements for successful growth, development and reproduction.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: <i>Water Tolerance</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 2: <i>Water Tolerance</i>, Part 2: <i>Observing Plants at 5 and 8 days</i>, Materials and Getting Ready, p. 14</li> <li>– Teacher Guide Science Stories folio, pp. 12-13</li> <li>– Teacher Guide Assessment folio, p. 10</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 3: <i>Water Tolerance</i> Part 2: <i>Observing Plants at 5 and 8 Days</i>, # 1-8</li> <li>– Teacher Guide pages 16-17</li> <li>– Investigation Duplication Master: Student Sheet No. 10, 11</li> <li>– Assessment - Assessment Chart for Investigation 3, Part 2 – Response Sheet – Water Tolerance Assessment folio, p. 10, Response Sheet Scoring Guide</li> <li>– Read FOSS Science Stories: <i>Auntie’s Plants</i>, pages 23-26. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>		<b>Homework/Extra Practice</b>  Home/School Connection, Student Sheet No. 31

## Grade 5

<b>WEEK 5 (continued)</b>	<p><b>Lesson 20 (45 min) Investigation 4, Day 1</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Aquatic environments include living and nonliving factors.</li> <li>• Water and temperature are two nonliving environmental factors to consider when setting up goldfish in an aquarium.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>	
	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, Part 1: <i>Goldfish Aquariums</i>, Materials and Getting Ready, pp. 8-10</li> <li>– Teacher Guide Science Stories folio, pp. 14-15</li> <li>– Teacher Guide Assessment folio, p. 12</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, to write questions to a scientist, for teaching tips, and other websites to support teaching Environments.</li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 4: <i>Aquatic Environments</i> Part 1: <i>Goldfish Aquariums</i>, # 1-11</li> <li>– Teacher Guide page 11-12</li> <li>– Investigation Duplication Master: Student Sheet No. 13, 14</li> <li>– Assessment - Assessment Chart for Investigation 4, Part 1 – Teacher Observation – Identifying Living and Nonliving Factors Assessment folio, p. 12, Teacher Observation Scoring Guide</li> <li>– Prepare to read FOSS Science Stories: <i>Aquatic Environments Around the World</i>, pages 27-35. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<p><b>Homework/Extra Practice</b></p>

## Grade 5

	<p><b>Lesson 21 (45 min) Investigation 3, Day 11 or more (Day 13); Investigation 4, Day 5</b></p> <p><b>Objective(s):</b> Within a range of tolerance, there are optimum conditions that produce maximum growth.</p>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
<b>WEEK 6</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 3: <i>Water Tolerance</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 2: <i>Water Tolerance</i>, Part 3: <i>Observing Plants at 11 or more days</i>, Materials and Getting Ready, p. 18</li> <li>– Teacher Guide Assessment folio, p. 11</li> <li>– <b>Inv. 4 Part 1</b> – Teacher Guide Science Stories folio, pp. 14-15</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 3: <i>Water Tolerance</i> Part 3: <i>Observing Plants at 11 or more Days</i>, # 1-11</li> <li>– Teacher Guide pages 16-17</li> <li>– Investigation Duplication Master: Student Sheet No. 12</li> <li>– Assessment - Assessment Chart for Investigation 3, Part 3 – Student Sheet / Journal Entry – Range of Tolerance and Optimum Conditions Assessment folio, p. 11, Scoring Guide</li> <li>– Read FOSS Science Stories: <i>Aquatic Environments Around the World</i>, pages 27-35. The estimated time for this reading is <b>30 minutes</b>.</li> </ul> <p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>TG Inv. 3, Part 3, Step 9. Assign journal entry as homework.</p>	

Grade 5

<b>WEEK 6 (continued)</b>	<p><b>Lesson 22 (45 min) Investigation 4, Day 6</b>  <b>Review TG Inv. 4, Part 2, p. 14-18 to determine planning – see suggestions below.</b></p> <p><b>Objective(s):</b>                  Carbon dioxide produced by aquatic organisms changes the acidity of the water.</p>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, Part 2: <i>Acid in Water</i>, Materials and Getting Ready, pp. 13-14</li> <li>– Teacher Guide Assessment folio, p. 13</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 4: <i>Aquatic Environments</i> Part 2: <i>Acid in Water</i>, # 1-15</li> <li>– Teacher Guide page 15-17</li> <li>– Investigation Duplication Master: Student Sheet No. 15, 16</li> <li>– Investigation Duplication Master: Response Sheet No. 16</li> <li>– Assessment - Assessment Chart for Investigation 4, Part 2 – Response Sheet – Aquatic Environments Assessment folio, p. 13, Response Sheet Scoring Guide</li> </ul> <p><b>NOTE:</b> In a contained classroom, this experiment can be conducted after the aquariums have been set up for 3 or 4 days.</p> <p>Contained classrooms: Complete Parts 1-9 in the AM; Parts 10-14 I in the PM; assign the Response Sheet for Homework.</p> <p>Cluster or Science Teacher: Have 1<sup>st</sup> class complete Parts 1-8 and set up Step 9 for later classes OR teacher sets up several sets of cups for Step 9 and introduces samples after students complete Step 8; assign the Response Sheet for Homework.</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Home/School Connection, Student Sheet No. 32</p>

## Grade 5

<b>WEEK 6 (continued)</b>	<p><b>Lesson 23 (45 min) next day: Investigation 4, Day 7</b></p> <p><b>Objective(s):</b> Carbon dioxide produced by aquatic organisms changes the acidity of the water.</p>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, Part 2: <i>Acid in Water</i>, Materials and Getting Ready, pp. 13-14</li> <li>– Teacher Guide Assessment folio, p. 13</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 4: <i>Aquatic Environments</i> Part 2: <i>Acid in Water</i>, # 16-18</li> <li>– Teacher Guide page 18</li> <li>– Investigation Duplication Master: Student Sheet No. 15, 16</li> <li>– Investigation Duplication Master: Response Sheet No. 16</li> <li>– Assessment - Assessment Chart for Investigation 4, Part 2 – Response Sheet – Aquatic Environments Assessment folio, p. 13, Response Sheet Scoring Guide</li> </ul> <p><b>NOTE:</b> Be sure to keep cups in darkness until student observation.</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Math Connection, Student Sheet No. 26</p>

## Grade 5

<b>WEEK 6 (continued)</b>	<b>Lesson 24 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Every organism has a range of tolerance for each factor in its environment.</li> <li>• Organisms have specific requirements for successful growth, development and reproduction.</li> <li>• Within a range of tolerance, there are optimum conditions that produce maximum growth.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> <li>• Gathering and organizing data.</li> <li>• Interpreting data and building explanations.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide, Benchmark Assessment Folio, pp. 32-41, 60</li> <li>– Plan Assessment Review time with class after teacher assessment coding.</li> </ul>	<b>Investigation/Activity</b> Benchmark Assessment Packet, Investigation 3, I-Check, pages 1-5	<b>Homework/Extra Practice</b>

## REVISION NOTE: Teacher Guide, Inv. 5, Part 1, Getting Ready, Step 6: Test Your Water and Eggs Ahead of Time

see: <http://www.fossweb.com/modules3-6/Environments/index.html>

### Module Teaching Notes in the Teacher Resources section of the Environments module page

#### Revisions for Investigation 5: Brine Shrimp Hatching

The salt concentration for Investigation 5 should be changed as follows.

1. Investigation 5, Part 1, Getting Ready, page 9, step 6 Test brine shrimp eggs a week or so before you plan to teach Investigation 5. Dissolve 5-ml of kosher salt in 150 ml of water. Add one minispoon of brine shrimp eggs. In two days you should have a little swarm of pinpoint-sized hatchlings moving around in the cup.
2. Investigation 5, Part 1, Guiding the Investigation, page 12, step 6 Modify the brine shrimp hatching experiment procedure and student sheet no. 17, *Hatching Brine Shrimp*, by cutting the amount of salt in half. You should still use the 5-ml spoon and 150 ml of water, but use only half as many spoons of salt. The cups should be labeled 0 spoons, 1 spoon, 2 spoons, and 3 spoons.

Student sheet no. 17 should be modified in a similar fashion. A PDF version of the revised sheet can be downloaded here:

[http://lhsfoss.org/fossweb/worksheets/unprotected/Environments17\\_BrineShrimp.pdf](http://lhsfoss.org/fossweb/worksheets/unprotected/Environments17_BrineShrimp.pdf)

Grade 5

	<p><b>Lesson 25 (45 min) Investigation 4, Day 12</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• The chain of feeding relationships between a series of organisms is called a food chain.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>	
<b>WEEK 7</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, Part 3: <i>New Organisms</i>, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 16-17, 18-19</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 4: <i>Aquatic Environments</i> Part 3: <i>New Organisms</i>, # 1-6</li> <li>– Teacher Guide page 21-22</li> <li>– Assessment - Assessment Chart for Investigation 4, Part 3 – Teacher Observation – informal notes</li> <li>– Prepare to read FOSS Science Stories: <i>Water Pollution: The Lake Erie Story</i>, page 36. <i>Sources of Water Pollution</i>, page 37. The estimated time for these readings is <b>30 minutes</b>.</li> <li><i>What is an Ecosystem</i>, pages 38 – 41. The estimated time for this reading is <b>TWO 30-minute sessions</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 7 (continued)</b>	<p><b>Lesson 26 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Every organism has a range of tolerance for each factor in its environment.</li> <li>• Organisms have specific requirements for successful growth, development and reproduction.</li> <li>• Within a range of tolerance, there are optimum conditions that produce maximum growth.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> <li>• Gathering and organizing data.</li> <li>• Interpreting data and building explanations.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 7.1a</li> <li>• General Skills: 1, 3, 4, 8, 9</li> </ul>	
	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, Benchmark Assessment Folio, pp. 32-41, 60</li> <li>– Plan Assessment Review time with class after teacher assessment coding</li> </ul>	<p><b>Investigation/Activity</b></p> <p>Benchmark Assessment Review, Investigation 3, I-Check, pages 1-5</p>	<p><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 7 (continued)</b>	<b>Lesson 27 (45 min) Investigation 4, Day 14</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• The chain of feeding relationships between a series of organisms is called a food chain.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, Part 3: <i>New Organisms</i>, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 16-17</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 4: <i>Aquatic Environments</i> Part 3: <i>New Organisms</i>, # 1-6 and 9</li> <li>– Teacher Guide page 21-22</li> <li>– Assessment - Assessment Chart for Investigation 4, Part 3 – Teacher Observation – informal notes</li> <li>– Read FOSS Science Stories: <i>Water Pollution: The Lake Erie Story</i>, page 36; <i>Sources of Water Pollution</i>, page 37.</li> </ul> <p>The estimated time for these readings is <b>30 minutes</b>.</p>	<b>Homework/Extra Practice</b>

Grade 5

<b>WEEK 7 (continued)</b>	<p><b>Lesson 28 (45 min) Investigation 4, Day 15</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• The chain of feeding relationships between a series of organisms is called a food chain.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Aquatic Environments</i>, Part 3: <i>New Organisms</i>, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 18-19</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 4: <i>Aquatic Environments</i> Part 3: <i>New Organisms</i>, # 1-8 and 9</li> <li>– Teacher Guide page 21-22</li> <li>– Assessment - Assessment Chart for Investigation 4, Part 3 – Teacher Observation – informal notes</li> <li>– Read FOSS Science Stories: <i>What is an Ecosystem</i>, pages 38-41.</li> </ul> <p>The estimated time for this reading is <b>TWO 30-minute sessions.</b></p>		<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Complete Science Stories: What is an Ecosystem?</p>

## Grade 5

	<p><b>Lesson 29 (45 min) Investigation 5, Day 1</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• An environmental factor is one part of an environment. It can be living or nonliving.</li> <li>• Every organism has a range of tolerance for each factor in its environment.</li> <li>• Brine shrimp are crustaceans that live in marine or salt-pond environments.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 6.1b, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>	
<b>WEEK 8</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 1: <i>Setting Up the Environment</i>, Materials and Getting Ready, pp. 8-9.</li> <li>– Teacher Guide Science Stories folio, pp. 20-21</li> <li>– <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a> – Check website for interactive simulations, to write questions to a scientist, for teaching tips, and other websites to support teaching Environments.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 5: <i>Brine Shrimp Hatching</i> Part 1: <i>Setting Up the Experiment</i>, # 1-12</li> <li>– Teacher Guide page 11-13</li> <li>– Investigation Duplication Master: download REVISED Teacher Sheet No. 8 (see NOTE above)</li> <li>– Assessment - Assessment Chart for Investigation 5, Part 1 – Teacher Observation – informal notes</li> <li>– Read FOSS Science Stories: <i>Brine Shrimp</i>, page 42. The estimated time for this reading is <b>20 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/ Extra Practice</b></p>

## Grade 5

<b>WEEK 8 (continued)</b>	<b>Lesson 30 (45 min) Investigation 5, Day 2</b> <b>Objective(s):</b> – Within a range of tolerance, there are optimum conditions that produce maximum growth. – Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 6.1b, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> – Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i> , pp. 1-7 – Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i> , Part 2: <i>Determining Range of Tolerance</i> , Materials and Getting Ready, pp. 14-15 – Teacher Guide Science Stories folio, pp. 22-23	<b>Investigation/Activity</b> – Investigation 5: <i>Brine Shrimp Hatching</i> Part 2: <i>Determining Range of Tolerance</i> , # 1-4 – Teacher Guide pages 16-18 – Investigation Duplication Master: download REVISED Student Sheet No. 17 (see NOTE above) – Assessment - Assessment Chart for Investigation 5, Part 1 – Teacher Observation – informal notes  – Read FOSS Science Stories: <i>The Mono Lake Story</i> , pages 43-45 The estimated time for this reading is <b>30 minutes</b> .	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 8 (continued)</b>	<b>Lesson 31 (45 min) Investigation 5, Day 3</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Within a range of tolerance, there are optimum conditions that produce maximum growth.</li> <li>• Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 6.1b, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 4: <i>Free Lunch</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 4: <i>Free Lunch</i>, Part 2: <i>Choosing Your Own Investigation</i>, Materials and Getting Ready, pp. 16-18</li> <li>– Teacher Guide Science Stories folio, pp. 18-23</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 5: <i>Brine Shrimp Hatching</i> Part 2: <i>Determining Range of Tolerance</i>, # 1-4</li> <li>– Teacher Guide pages 16-18</li> <li>– Investigation Duplication Master: download REVISED Student Sheet No. 17 (see NOTE above)</li> <li>– Assessment - Assessment Chart for Investigation 5, Part 2 –Teacher Observation – informal notes</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 8 (continued)</b>	<b>Lesson 32 (45 min) Investigation 5, Day 4</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>• Within a range of tolerance, there are optimum conditions that produce maximum growth.</li> <li>• Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 6.1b, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching, Part 2: Determining Range of Tolerance</i>, Materials and Getting Ready, pp. 14-15</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 5: <i>Brine Shrimp Hatching Part 2: Determining Range of Tolerance</i>, # 5-13</li> <li>– Teacher Guide pages 16-18</li> <li>– Investigation Duplication Master: download REVISED Student Sheet No. 17 (see NOTE above)</li> <li>– Assessment - Assessment Chart for Investigation 5, Part 2 –Teacher Observation – informal notes</li> </ul>	<b>Homework/ Extra Practice</b>  Math Connection, Student Sheet No. 27

## Grade 5

**NOTE:** Monitor the brine shrimp cultures between sessions. You may need to provide fresh Day 5 brine shrimp cultures for Lesson 33: Inv. 5, Part 3: Determining Viability.

	<p><b>Lesson 33 (45 min) Investigation 5, Day 8</b></p> <p><b>Objective(s):</b> By altering the environment to optimum salt concentration, brine shrimp eggs that were once dormant can hatch.</p>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 6.1b, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>	
<b>WEEK 9</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 3: <i>Determining Viability</i>, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 24-25</li> <li>– Teacher Guide Assessment folio, pp. 14-15</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Investigation 5: <i>Brine Shrimp Hatching</i> Part 3: <i>Determining Viability</i>, # 1-4</li> <li>– Teacher Guide pages 11-13</li> <li>– Investigation Duplication Master: Response Sheet No. 18</li> <li>– Assessment - Assessment Chart for Investigation 5, Part 3 – Student Sheet -Aquatic Environments Journal - Assessment folio, p. 14</li> <li>– Assessment Chart for Investigation 5, Part 3 – Response Sheet – Brine Shrimp Assessment folio, p. 15 – Response Sheet Scoring Guide</li> <li>– Prepare to read FOSS Science Stories: <i>Shrimp Aquaculture</i>, page 46 The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 9 (continued)</b>	<b>Lesson 34 Optional (45 min) Investigation 5, Day 9</b> <b>Objective(s):</b> By altering the environment to optimum salt concentration, brine shrimp eggs that were once dormant can hatch.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 6.1b, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 3: <i>Determining Viability</i>, Materials and Getting Ready, pp. 19-20</li> <li>– Teacher Guide Science Stories folio, pp. 24-25</li> <li>– Teacher Guide Assessment folio, pp. 14-15</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 5: <i>Brine Shrimp Hatching</i> Part 3: <i>Determining Viability</i>, # 5-10</li> <li>– Teacher Guide pages 11-13</li> <li>– Investigation Duplication Master: Response Sheet No. 18</li> <li>– Assessment -            Assessment Chart for Investigation 5, Part 3 – Student Sheet            -Aquatic Environments Journal - Assessment folio, p. 14            Assessment Chart for Investigation 5, Part 3 – Response Sheet – Brine Shrimp            Assessment folio, p 15 – Response Sheet Scoring Guide</li> <li>– Read FOSS Science Stories: <i>Shrimp Aquaculture</i>, page 46.            The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>  Response Sheet No. 18, Brine Shrimp

## Grade 5

<b>WEEK 9 (continued)</b>	<b>Lesson 35 (45 min) Investigation 6, Day 1</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>Organisms have ranges of tolerance for environmental factors.</li> <li>In a controlled experiment, one variable is manipulated while all others are held constant.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>LE 7.2b, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 5, 8, 9</li> <li>Living Environment Skills: 6</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 6: <i>Salt of the Earth</i>, pp. 1-7</li> <li>Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 1: <i>Setting Up the Experiment</i>, Materials and Getting Ready, pp. 8-10</li> <li>Teacher Guide Science Stories folio, pp. 26-27</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>Investigation 6: <i>Salt of the Earth</i> Part 1: <i>Setting Up the Experiment</i>, # 1-12</li> <li>Teacher Guide pages 11-13</li> <li>Investigation Duplication Master: Teacher Sheet No. 8</li> <li>Investigation Duplication Master: Student Sheet No. 9</li> <li>Assessment - Assessment Chart for Investigation 6, Part 1 – Teacher Observation – informal notes</li> <li>Read FOSS Science Stories: <i>Breeding Plants</i>, pages 47-48. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 9 (continued)</b>	<b>Lesson 36 (45 min) Investigation 6, Day 2</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>Organisms have ranges of tolerance for environmental factors.</li> <li>In a controlled experiment, one variable is manipulated while all others are held constant.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>LE 7.2b, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 5, 8, 9</li> <li>Living Environment Skills: 6</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 6: <i>Salt of the Earth</i>, pp. 1-7</li> <li>Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 1: <i>Setting Up the Experiment</i>, Materials and Getting Ready, pp. 8-10</li> <li>Teacher Guide Science Stories folio, pp. 26-27</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>Investigation 6: <i>Salt of the Earth</i> Part 1: <i>Setting Up the Experiment</i>, # 13-16</li> <li>Teacher Guide pages 11-13</li> <li>Investigation Duplication Master: Teacher Sheet No. 8</li> <li>Investigation Duplication Master: Student Sheet No. 9</li> <li>Assessment - Assessment Chart for Investigation 6, Part 1 – Teacher Observation – informal notes</li> <li>Read FOSS Science Stories: <i>Breeding Plants</i>, pages 47-48. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 10</b>	<p><b>Lesson 37 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Aquatic environments include living and nonliving factors.</li> <li>• Water and temperature are two nonliving environmental factors to consider when setting up goldfish in an aquarium.</li> <li>• Carbon dioxide produced by aquatic organisms changes the acidity of the water.</li> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• Brine shrimp are crustaceans that live in marine or salt-pond environments.</li> <li>• Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.</li> <li>• By altering the environment to optimum salt concentration, brine shrimp eggs that were once dormant can hatch.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> <li>• Gathering and organizing data.</li> <li>• Interpreting data and building explanations.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, Benchmark Assessment Folio, pp. 42-49, 60</li> <li>– Plan Assessment Review time with class after teacher assessment coding.</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <p>Benchmark Assessment Packet, Investigation 4-5, I-Check, pages 1-4.</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p> <p>Home/School Connection, Student Sheet No. 33</p>

## Grade 5

<b>WEEK 10 (continued)</b>	<b>Lesson 38 (45 min) Investigation 6, Day 7</b> <b>Objective(s):</b> Plants have different tolerances for salt.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 5, 8, 9</li> <li>• Living Environment Skills: 6</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 6: <i>Salt of the Earth</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 2: <i>Observing Plants</i>, Materials and Getting Ready, pp. 14-15</li> <li>– Teacher Guide Science Stories folio, pp. 28-29</li> <li>– Teacher Guide Assessment folio, p. 16</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 6: <i>Salt of the Earth</i> Part 2: <i>Observing Plants</i>, # 1-2, 13</li> <li>– Teacher Guide pages 16-17</li> <li>– Investigation Duplication Master: Student Sheet No. 10, 12</li> <li>– Investigation Duplication Master: Response Sheet No. 19</li> <li>– Assessment - Assessment Chart for Investigation 6, Part 2 – Response Sheet – <i>Salt of the Earth</i> Assessment folio, p. 16</li> <li>– Read FOSS Science Stories: <i>What Happens When Ecosystems Change?</i>, pages 49-52. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 10 (continued)</b>	<p><b>Lesson 39 (45 min)</b></p> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Aquatic environments include living and nonliving factors.</li> <li>• Water and temperature are two nonliving environmental factors to consider when setting up goldfish in an aquarium.</li> <li>• Carbon dioxide produced by aquatic organisms changes the acidity of the water.</li> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• Brine shrimp are crustaceans that live in marine or salt-pond environments.</li> <li>• Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.</li> <li>• By altering the environment to optimum salt concentration, brine shrimp eggs that were once dormant can hatch.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> <li>• Gathering and organizing data.</li> <li>• Interpreting data and building explanations.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 8, 9</li> <li>• Living Environment Skills: 7</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <p>Teacher Guide, Benchmark Assessment Folio, pp. 1-21, 60</p>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <p>Benchmark Assessment Review (selected items)</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 10 (continued)</b>	<b>Lesson 40 (45 min) Investigation 6, Day 6</b> <b>Objective(s):</b> Plants have different tolerances for salt.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 5, 8, 9</li> <li>• Living Environment Skills: 6</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 6: <i>Salt of the Earth</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 2: <i>Observing Plants</i>, Materials and Getting Ready, pp. 14-15</li> <li>– Teacher Guide Science Stories folio, pp. 30-31</li> <li>– Teacher Guide Assessment folio, p. 16</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 6: <i>Salt of the Earth</i> Part 2: <i>Observing Plants</i>, # 2-3, 13</li> <li>– Teacher Guide pages 16-17</li> <li>– Investigation Duplication Master: Student Sheet No. 10, 12</li> <li>– Investigation Duplication Master: Response Sheet No. 19</li> <li>– Assessment - Assessment Chart for Investigation 6, Part 2 – Response Sheet – Salt of the Earth Assessment folio, p. 16</li> <li>– Read FOSS Science Stories: <i>How Organisms Depend on Each Other</i>, pages 53-55. The estimated time for this reading is <b>30 minutes</b>.</li> </ul>	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 11</b>	<p><b>Lesson 41</b> (6 sessions, 45 min each) (2 sessions each for planning, experimentation, and presentations). More time may be desirable if student presentations include posters/charts/graphics.</p> <p><b>Objective(s):</b> FOSS® encourages the use of student projects in Choosing Your Own Investigation. Students develop investigation plans, do systematic work to complete investigations and support conclusions with evidence. While it may not be possible to complete projects in every FOSS® unit, creative management and interdisciplinary opportunities will allow students to gain experience in manageable independent projects. In Environments FOUR to SIX SESSIONS may be incorporated to complete Investigation 6.</p> <ul style="list-style-type: none"> <li>Apply environmental concepts.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>LE 7.2b, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 5, 8, 9</li> <li>Living Environment Skills: 6</li> </ul>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>Teacher Guide Inv. 6: <i>Salt of the Earth</i>, pp. 1-7</li> <li>Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 3: <i>Choosing Your Own Investigation</i>, Materials and Getting Ready, pp. 18-20</li> <li>Teacher Guide Assessment folio, p. 17-18</li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Investigation 6: <i>Salt of the Earth</i> Part 3: <i>Choosing Your Own Investigation</i>, # 1-6</li> <li>Teacher Guide pages 21 - 22</li> <li>Investigation Duplication Master: Student Sheet No. 20, 21, 22</li> <li>Assessment - Assessment Chart for Investigation 6, Part 3 – Student Sheet – Project Proposal; Teacher Observation – Independent Investigation and Research, Presentation Assessment folio, p. 17-18</li> </ul>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 11 (continued)</b>	<b>Lesson 42 (45 min) Investigation 6, Day 13</b> <b>Objective(s):</b> Plants have different tolerances for salt.		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• LE 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 3, 4, 5, 8, 9</li> <li>• Living Environment Skills: 6</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide Inv. 6: <i>Salt of the Earth</i>, pp. 1-7</li> <li>– Teacher Guide Inv. 5: <i>Brine Shrimp Hatching</i>, Part 2: <i>Observing Plants</i>, Materials and Getting Ready, pp. 14-15</li> <li>– Teacher Guide Assessment folio, p. 16</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Investigation 6: <i>Salt of the Earth</i> Part 2: <i>Observing Plants</i>, # 4-12</li> <li>– Teacher Guide pages 16-17</li> <li>– Investigation Duplication Master: Student Sheet No. 10, 12</li> <li>– Investigation Duplication Master: Response Sheet No. 19</li> <li>– Assessment - Assessment Chart for Investigation 6, Part 2 – Response Sheet – <i>Salt of the Earth</i> Assessment folio, p. 16</li> </ul>	<b>Homework/Extra Practice</b>  Response Sheet No. 19, <i>Salt of the Earth</i>

## Grade 5

<b>WEEK 11 (continued)</b>	<b>Lesson 43 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>Organisms have ranges of tolerance for environmental factors.</li> <li>In a controlled experiment, one variable is manipulated while all others are held constant.</li> <li>Plants have different tolerances for salt.</li> <li>Apply environmental concepts.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>LE 7.2b, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 5, 8, 9</li> <li>Living Environment Skills: 6</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide, Benchmark Assessment Folio, pp. 50-59, 60</li> <li>Plan Assessment Review time with class after teacher assessment coding.</li> </ul>	<b>Investigation/Activity</b> Benchmark Assessment Packet, Investigation 6, I-Check, pages 1-5.	<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 11 (continued)</b>	<b>Lesson 44 (45 min)</b> <b>Objective(s):</b> <ul style="list-style-type: none"> <li>Organisms have ranges of tolerance for environmental factors.</li> <li>In a controlled experiment, one variable is manipulated while all others are held constant.</li> <li>Plants have different tolerances for salt.</li> <li>Apply environmental concepts.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>LE 7.2b, 7.2c, 7.2d</li> <li>General Skills: 1, 3, 4, 5, 8, 9</li> <li>Living Environment Skills: 6</li> </ul>	
	<b>Advanced Planning/ Notes to Teachers</b> Teacher Guide, Benchmark Assessment Folio, pp. 1-21, 60	<b>Investigation/Activity</b> Benchmark Assessment Review (selected items)		<b>Homework/Extra Practice</b>

## Grade 5

<b>WEEK 12</b>	<p><b>Lesson 45 (45 min)</b></p> <p><b>Objective(s):</b> Survey / Post-test</p> <ul style="list-style-type: none"> <li>• Environment is everything that surrounds and influences an organism.</li> <li>• An environmental factor is one part of an environment. It can be living or nonliving.</li> <li>• A relationship exists between a number of environmental factors (such as how much water plants get) and how well organisms grow.</li> <li>• Environments change over time.</li> <li>• Every organism has a set of preferred environmental conditions.</li> <li>• Isopods and beetles prefer dark environments.</li> <li>• Every organism has a range of tolerance for each factor in its environment.</li> <li>• Organisms have specific requirements for successful growth, development and reproduction.</li> <li>• Within a range of tolerance, there are optimum conditions that produce maximum growth.</li> <li>• Aquatic environments include living and nonliving factors.</li> <li>• Water and temperature are two nonliving environmental factors to consider when setting up goldfish in an aquarium.</li> <li>• Carbon dioxide produced by aquatic organisms changes the acidity of the water.</li> <li>• An aquatic environment can contain many different organisms.</li> <li>• Organisms of different kinds living together form a community.</li> <li>• Brine shrimp are crustaceans that live in marine or salt-pond environments.</li> <li>• Brine shrimp can hatch in a range of salt concentrations, but more hatch in environments with optimum salt concentration.</li> <li>• By altering the environment to optimum salt concentration, brine shrimp eggs that were once dormant can hatch.</li> <li>• Designing an investigation involves controlling the variables so that the effect of one factor can be observed.</li> <li>• Gathering and organizing data.</li> <li>• Interpreting data and building explanations.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>• General Skills: 1, 2, 3, 4, 5, 8, 9</li> <li>• Living Environment Skills: 6, 7</li> </ul>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, Benchmark Assessment Folio, pp. 1-21, 60</li> <li>– Download optional tool: Benchmark and I-Check Assessment coding sheets at <a href="http://www.fossweb.com/NYC">www.fossweb.com/NYC</a></li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <p>Benchmark Assessment Packet, Survey/Post-test, pages 1-5</p>	<p style="text-align: center;"><b>Homework/Extra Practice</b></p>

## Grade 5

<b>WEEK 12 (continued)</b>	<b>Lesson 44 (45 min)</b> <b>Objective(s):</b> Survey / Pre-assessment <ul style="list-style-type: none"> <li>Apply environmental concepts.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>LE 3.2a, 5.1c, 5.1d, 5.1e, 5.2a, 6.1a, 6.1b, 6.2a, 7.1a, 7.2b, 7.2c, 7.2d</li> <li>General Skills: 1, 2, 3, 4, 5, 8, 9</li> <li>Living Environment Skills: 6, 7</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> Teacher Guide, Benchmark Assessment Folio, pp. 1-21, 60	<b>Investigation/Activity</b> Benchmark Assessment Review (selected items)	<b>Homework/Extra Practice</b>