

## Unit 4—Dynamic Equilibrium: Other Organisms

### Living Things in Their Environment (Delta Science Modules™ Custom Kit)

#### Essential Question: How is homeostasis maintained in other organisms?

**General Skills:** quoted from the NYS Core Curriculum *(Note: Correlation is provided at the “Hands-on Activity” 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.
6. Develop and use a dichotomous key.
7. Sequence events.
8. Identify cause-and-effect relationships.

**Living Environment Skills:** quoted from the NYS Core Curriculum *(Note: Correlation is provided at the “Hands-on Activity” level.)*

1. Manipulate a compound microscope to view microscopic objects.
2. Determine the size of a microscopic object using a compound microscope.
3. Prepare a wet mount slide.
4. Use appropriate staining techniques.
6. Classify living things according to a student-generated scheme and an established scheme.
9. Identify structure and function relationships in organisms.

**Major Understandings:** quoted from NY State Performance Indicators *(Note: Correlation is provided at the “Hands-on Activity” level.)*

**LE 1.1 Compare and contrast the parts of plants, animals, and one celled organisms.**

- 1.1d Some organisms are single cells; others, including humans are multicellular.
- 1.1f Many plants have roots, stems, leaves, and reproductive structures. These organized groups of tissues are responsible for a plant’s life activities.
- 1.1g Multicellular animals often have similar organs and specialized systems for carrying out major life activities.

## Grade 7

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

- 5.1a Animals and plants have a great variety of body plans and internal structures that contribute to their ability to maintain a balanced condition.
- 5.1b An organism's overall body plan and its environment determine the way that the organism carries out the life processes.
- 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.
- 5.1f Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required for survival. Regulation includes a variety of nervous and hormonal feedback systems.
- 5.1g The survival of an organism depends on its ability to sense and respond to its external environment.

**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.
- 5.2b Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals and water. Each substance is vital to the survival of the organism.
- 5.2c Metabolism is the sum of all chemical reactions in an organism. Metabolism can be influenced by hormones, exercise, diet, and aging.
- 5.2e In order to maintain a balanced state, all organisms have a minimum daily intake of each type of nutrient based on species, size, age, sex, activity, etc. An imbalance in any of the nutrients might result in weight gain, weight loss, or a diseased state.

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

- 6.2a The major source of atmospheric oxygen is photosynthesis. Carbon dioxide is removed from the atmosphere and oxygen is released during photosynthesis.

**ERRATA:**

DSM Living Things in Their Environment Teacher's Guide

Program Introduction p. iii Program Components include:

- A Teacher's Guide.
- Delta Science Readers (**32 copies**).
- Materials and equipment for **5 classes of 32 students**.

## Grade 7

**IMPORTANT NOTES**

**Preview the DSM Living Things in Their Environment Teacher’s Guide:**

**Consult the:**

**Program Introduction, p. iv – v; Assessment Features, p. ix; Communicating About Science, p. xi**

**Science at Home / Connections for DSM™ Living Things in Their Environment:**

Follow-up activities designed for home and ways to integrate activities and ideas are provided at the end of each activity. Suggestions for extra practice with challenging concepts also are included in the “*Reinforcement*” section of the activities. A link to the Student, Parent and Teacher resources that support **DSM™ Living Things in Their Environment** can be found at: [http://www.fossweb.com/NYC/modules6-8/DSM\\_LTE/livingthingsenviroment.html](http://www.fossweb.com/NYC/modules6-8/DSM_LTE/livingthingsenviroment.html)

**Extending the Experience:** “Connections” enrichment activities may be considered AT ANY TIME DURING THE MODULE. These experiences that follow many investigations may be suitable for enrichment, concept review prior to assessment, homework or for a lesson plan to be delivered by a substitute teacher when a hands-on investigation may not be appropriate.

**Review the Module Overview:**

**Overview Chart for Hands-on Activities**, p. 2-3

**Overview Chart for Science Reader**, p.4

**Science Background**, p. 5-6

**Materials List**, p. 7 (Teacher Provided Items, p. 7-8). Note that you will need to plan ahead to order Living Materials using the Living Materials Cards provided in the kit.

A variegated *Coleus* plant (preferably green / white) and 3 geranium plants are needed for each class.

In Activity 7, the *Coleus* plant will be denuded of it’s leaves. One leaf is required for each group Either a large plant which can be pinched back and maintained for future use or a small plant with 8-12 leaves that will be discarded are options.

The Geranium plant is used in Activity 7 and the active Assessment at the end of the unit. 3 plants, with 32 leaves each are required. The plant used in Activity 1 will be denuded of 8 leaves (1 per group); the other two plants will loose one leaf for each student performing the Assessment.

## Grade 7

**Science Materials Supplied by the Teacher/School for DSM™ Living Things in Their Environment:**

The **DSM™ Living Things in Their Environment** Middle School module is designed for use in classrooms where a teacher sees several sections of students working on the same unit of study each day. Typically this takes place in the ‘science lab’ The kit provides two bins of materials shared by all classes and five bins of equipment and consumable materials for five classes of 32 students. (See Materials section of the Teacher Guide, pp. 7-8.) Teachers using this unit will have consumable materials for 160 student uses. Teacher provided items (listed on p. 26) include common classroom supplies and science equipment frequently found in the middle school setting. Additional living plants and perishable materials must be obtained from a biological supply house, nursery or grocery store. Review this list to determine if you need any additional materials.

The section of this Planning Guide called “**Science Materials Supplied by the Teacher**” details the equipment, tools, resources and other significant items needed for the daily lesson. It does not include common classroom supplies like paper, pencils, marking pens, staplers, etc.

**Review the Hands –on Activities:**

**Activity Summary**, p. 9

**Schedule**, p. 10

**Preparing for the Activities**, p. 11-13 including **Advance Preparation Notes for Activity 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.**

**Note: Living Materials Shipments should be ordered 4 weeks before starting the activity. Consult p. 13 for Immediate Care instructions for your shipment.**

**Materials Management**, p. 13. Consider sub-culturing the Euglena culture to increase both the volume of material and the density of the culture. The culture should be obtained at the beginning of the unit if you intend to sub-culture.

**Using the Delta Science Reader: Living Things in Their Environment:**

Use of the student book is prompted in this planning guide at the end of an activity to support and extend experiment content. The readings and/or the questions posed after the readings, “Study Skills,” “My Journal,” and vocabulary study and reflections can all be incorporated into student notebooks and used as homework. **See the “Reader” section of the DSM Living Things in Their Environment Teacher Guide for the Science Reader Living Things in Their Environment Teacher Guide (SRLTTE Teacher Guide).** These teaching pages support guiding the reading, suggestions for pre- and post-reading strategies, summary and assessment questions and end of unit “Writing Link.”

**Time on Task in DSM™ Living Things in Their Environment: Activities and DSM Reader**

- For YEAR ONE of the new Science Curriculum adoption the 7<sup>th</sup> grade Planning Calendar has been designed to incorporate **all** parts of the curriculum into the classroom instruction time. Specific comments have been added to note portions of investigations that may be moved out of direct instruction time and used as reinforcement (as homework or at the teacher’s discretion). It is recommended that teachers modulate the use of the variety of instructional experiences to address student learning styles, classroom management and student interest. *The first time user of DSM™ Living Things in Their Environment is encouraged to follow the path of the Teacher Guide. In future years, modifications that will enhance student understanding will be well grounded in curriculum objectives and teacher experiences.*
- Students will likely benefit from the initial use of the DSM Reader during class time. Use of the DSM Reader will **add** variable amounts of time to the lesson. Sections of the DSM Reader are revisited to reinforce concepts. Preview the DSM Reader and Overview Chart for Hands-on Activities (pp. 2-3) to determine your focus for each Lesson.

## Grade 7

**Consult DSM™ Living Things in Their Environment Teacher Guide – Materials List, p. 7-8**

- Inventory all kit boxes and equipment: 2 boxes of materials shared by all classes, 5 boxes of consumable materials (one for each class of 32 students).
- Plan to secure “Materials Supplied by the Teacher,” p. 7-8.

Follow the link [http://www.deltaeducation.com/science/foss/foss\\_msds.aspx](http://www.deltaeducation.com/science/foss/foss_msds.aspx) to download the materials safety data sheets for ethyl alcohol, Lugol’s iodine solution and salt (sodium chloride).

Search by keyword: “Alcohol, ethyl;” “Iodine” or “Lugol’s;” ‘salt’ (or “sodium chloride”)

Visit the New York City FOSS website at [http://www.fossweb.com/NYC/modules6-8/DSM\\_LTE/livingthingsenviroment.html](http://www.fossweb.com/NYC/modules6-8/DSM_LTE/livingthingsenviroment.html) for additional support and links to student, parent and teacher resources.

**NOTE:**

Familiarize yourself with the living materials used in this unit. Living materials cards (if purchased with your order) are found in a white and green striped envelope (7.5 x 10.5 in.) packed with your kit. Included are:

- Activity 3: # 270-2220 Elodea Sprigs (pkg/6)
- Activity 10 # 1288523 Sowbugs (50 ea.)
- Activity 11 #270-4375 Euglena (60 ml jar)

In addition the following items must be obtained locally or through a biological materials supply house or nursery.

- Activity 5: fresh red onion
- Activity 7: geranium plant (1 per class); variegated green and white coleus (1 per class); potato (1 – refrigerate between classes or use a fresh one each day)

**NOTE:**

All activities / experiments / demonstrations are to be conducted in accordance with the NYC DoE Science Safety Manual K-12 (2008) which is available at <http://schools.nycenet.edu/offices/teachlearn/science/ScienceSafetyManual.6.17.08.pdf>

Review the Science Reader *Living Things in Their Environment* Teacher Guide (SRLTTE Teacher Guide) pp. Ti - Tvi prior to Lesson 1.

Refer to Teacher Guide p. 11 for the Advance Preparation for Activities 2 and 3.

Grade 7

<b>WEEK 1</b>	<p><b>Lesson 1 (45 min) Activity 1: Using a Compound Microscope</b></p> <p><b>Objective(s): Students learn how to use a compound microscope safely and how to prepare samples for observation.</b></p> <ul style="list-style-type: none"> <li>• Identify the parts of a compound microscope.</li> <li>• Prepare a wet mount.</li> <li>• Compare and contrast an object with its magnified image.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1</li> <li>• Living Environment Skills: 1, 2, 3</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Review Assessment strategies: See Teacher Guide, Assessment, pp. 141-146, and copymasters.</li> <li>– Make copies of the School-Home Connection copymaster to send home with students.</li> <li>– Teacher Guide, pp. 15-22 taking note of:             <ul style="list-style-type: none"> <li>p. 15 materials.</li> <li>p. 15 preparation.</li> <li>p. 15 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 17-21, Steps # 1-9</li> <li>– Copymaster: Activity Sheet 1</li> </ul> <p><b>Note:</b> To increase student microscope skills consider repeating all or part of this activity on a second day. See the “Reinforcement” section on p. 21. Human hair, clothing fibers, <u>sheer</u> ribbons, colored newsprint or magazine papers are good choices for wet mounts.</p> <p><b>Science at Home:</b> Use hand lenses to practice focusing on small objects. Compare hand/magnifying lenses with other lenses (such as glasses worn to correct vision impairments).</p>

Grade 7

<b>WEEK 1 (continued)</b>	<p><b>Lesson 2 (45 min) Activity 2: A Pond Ecosystem (1 of 3 sessions)</b></p> <p><b>Objective(s):</b> Students establish a miniature pond ecosystem, observe the organisms over time, and determine how each kind of organism gets nutrients and energy to sustain life.</p> <ul style="list-style-type: none"> <li>• Monitor the appearance of different organisms in a miniature pond ecosystem.</li> <li>• Classify the pond organisms as unicellular or multicellular.</li> <li>• Classify the pond organisms according to how they get the energy they need for their survival.</li> <li>• Diagram a simple food chain of pond organisms.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 5</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 23-26 taking note of:                             <ul style="list-style-type: none"> <li>p. 23 schedule</li> <li>p. 23 materials</li> <li>p. 23-25 preparation</li> <li>p. 25-26 background information</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 26-30, Steps # 1-8</li> <li>– Copymaster: Activity Sheet 2</li> <li>– Delta Science Reader: pp. 36-39; 9</li> <li>– SRLTTE Teacher Guide: pp. T36-T39; T5-T10</li> <li>– Science at Home: p. 35</li> </ul> <p><b>Note:</b> The class will return to this activity in Lesson 7 and Lesson Y.</p>	

## Grade 7

<b>WEEK 1 (continued)</b>	<p><b>Lesson 3 (45 min) Activity 3: Plant Cell Structure</b></p> <p><b>Objective(s): Students use a microscope to observe the cells in a plant leaf. They identify cell structures and discuss the function of each.</b></p> <ul style="list-style-type: none"> <li>• Observe an <i>Elodea</i> leaf with and without a microscope.</li> <li>• Identify the major cellular organelles in a plant leaf cell.</li> <li>• Diagram a representative leaf cell to scale.</li> <li>• Discuss the function of plant cell organelles.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d, 1.1f, 5.1c</li> </ul>
	<p><b>Advanced Planning/Notes to Teacher</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 37-38 taking note of: <ul style="list-style-type: none"> <li>p. 37 schedule.</li> <li>p. 37 materials.</li> <li>p. 37 preparation.</li> <li>p. 38 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 39-41, Steps # 1-7</li> <li>– Copymaster: Activity Sheet 3</li> <li>– Delta Science Reader: pp. 5; 9; 16-17; 19; 24; 26; 33</li> <li>– SRLTTE Teacher Guide: pp. T5-T10; T11-T17; T24-T28; T29-T35</li> <li>– Science at Home: p. 42</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Microscope, compound – 1 for every 4 students</li> <li>• Green pencil</li> <li>• Overhead projector</li> </ul>

## Grade 7

	<p><b>Lesson 4 (45 min) Activity 4: Modeling Osmosis</b></p> <p><b>Objective(s): Students build models to explore the movement of water by osmosis.</b></p> <ul style="list-style-type: none"> <li>• Construct models of cells to simulate the selectively-permeable nature of the cell membrane.</li> <li>• Measure the mass of model cells before and after osmosis occurs.</li> <li>• Conclude that water moves from an area of higher water concentration to an area of lower water concentration.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 3, 4, 7, 8</li> <li>• Living Environment Skills: 9</li> <li>• Living Environment: 5.1f, 5.1g</li> </ul>	
WEEK 1 (continued)	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 45-47 taking note of: <ul style="list-style-type: none"> <li>p. 45 schedule.</li> <li>p. 45 materials.</li> <li>p. 45-46 preparation.</li> <li>p. 46 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 47-52, Steps # 1-12</li> <li>– Copymaster: Activity Sheet 4</li> <li>– Delta Science Reader: pp. 13; 19-22</li> <li>– SRLTTE Teacher Guide: pp. T11-T17; T18-T23</li> <li>– Science at Home: p. 52</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• One electronic balance may substitute for several triple-beam balances to facilitate student work.</li> <li>• To conduct this activity over a two-day period, students can prepare the three osmosis “cells” (2 sugar solution and 1 distilled water) through step 5. Test for leaks as explained in step 6. Instead of placing the cells in the cups to determine the mass, place the cells in a large container (sugar cells in sugar solution; distilled water cells in distilled water) overnight. The next day retrieve the cells, blot with paper towels and put in the appropriate cups from step 5. Determine the mass and proceed with steps 7 through 9. This will allow more time for step 7. The Delta Science Reader may be used during this wait time.</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Balance, triple beam – 1 for every 4 students <i>or</i> Electronic balance – 1 for class</li> <li>• 1-liter graduated cylinder</li> <li>• 5 clean bottles with caps for solution preparation (1 liter for 1 class; 1 gallon for multiple classes)</li> <li>• Distilled water</li> </ul>

Grade 7

<p><b>Refer to Teacher Guide, p. 11, for the Advance Preparation for Activities 5, 6, 7, and 8.</b></p>				
<p><b>WEEK 1 (continued)</b></p>	<p><b>Lesson 5 (45 min) Activity 5: Osmoregulation in Plant Cells</b></p> <p><b>Objective(s): Students observe osmoregulation in onion skin cells. They infer that selectively permeable membranes are important in controlling water balance in plant cells and that osmoregulation is necessary for survival.</b></p> <ul style="list-style-type: none"> <li>• Observe shrinkage of a plant cell’s contents when exposed to salt water.</li> <li>• Observe that shrinkage due to a salty environment can be reversed.</li> <li>• Recognize that a cell must sense the conditions in its external environment and regulate the uptake or loss of water to maintain homeostasis.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 4, 7, 8</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d, 5.1a</li> </ul>	
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 55-56 taking note of:                             <ul style="list-style-type: none"> <li>p. 55 schedule.</li> <li>p. 55 materials.</li> <li>p. 55 preparation.</li> <li>p. 56 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 57-60, Steps # 1-9                              Copymaster: Activity Sheet 5                              Delta Science Reader: pp. 2-4; 13; 16-17; 19-21; 31; 33                              SRLTTE Teacher Guide: pp. T1-T4; T11-T17; T18-T23; T29-T35</li> <li>– Science at Home: p. 61</li> </ul> <p><b>Notes:</b>                      Review the Science Connections (p. 62) to reinforce the concepts of osmosis and osmoregulation.</p>		<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Microscope, compound – 1 for every 4 students</li> <li>• Balance, triple beam – 1 for every 4 students                              or                              Electronic balance – 1 for class</li> <li>• Distilled water</li> </ul>
<p><b>NOTE:</b> As with all experiments involving plant growth, teachers will need to be flexible and attentive to the elapsed time between sessions, timing of observations and the progress of the experiments.</p> <p><b>Activity 6:</b> “Plants and Pollution” and <b>Activity 8:</b> “Plant and Nitrogen” each require approximately 4 weeks for plant growth. Recognizing that this Unit takes place at the end of the year and available teaching days may be limited, consider running these Activities IN PARALLEL rather than in sequence. If you teach several sections of Grade 7, also consider setting up “Treatments” that are shared between classes (one class labels materials; the next class prepares the pots; the next class plants the seeds; all classes review the procedure). Allow for extra plantings to serve as “back-ups” in case of accidents or other factors.</p> <p>(Given the anticipated timeframe, this planning guide deviates from the sequence of the TG Schedule on page 10. Activities 10, 11 and 12 are completed before the final sessions of Activities 6 and 8, allowing for an extra week for plant growth. Review the full sequence to insure that the delivery of living materials for Activities 10, 11, and 12 will be timely.</p>				

## Grade 7

	<p><b>Lesson 6 (45 min) Activity 6: Plants and Pollution (Session 1)</b></p> <p><b>Objective(s):</b> Students investigate the effect of chemical pollutants on the growth of radish seedlings.</p> <ul style="list-style-type: none"> <li>• Observe the effects of different environmental pollutants on the growth of established radish seedlings.</li> <li>• Compare the mass of seedlings exposed to pollutants with the mass of a control group.</li> <li>• Construct graphs illustrating the effects of pollution on the growth rate of radish seedlings.</li> <li>• Conclude that environmental pollutants can influence a plant’s growth and development .</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 3, 4, 7, 8</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d, 5.1g; 5.2c, 5.2e</li> </ul>	
<b>WEEK 2</b>	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 63-65 taking note of: <ul style="list-style-type: none"> <li>p. 63 schedule.</li> <li>p. 63 materials.</li> <li>p. 63-64 preparation.</li> <li>p. 64-65 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 66-72, Steps # 1-4; <u>read ahead to prepare for Steps # 5-8 over the next 14-30 days</u>; Step # 9-12 are conducted as a separate session.</li> <li>– Copymaster: Activity Sheet 6, Part A</li> <li>– Delta Science Reader: pp. 2-4; 29-34</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T29-T35</li> <li>– Science at Home: p. 73</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• One class period may be devoted to the transitional day for the experiment (Step #7).</li> <li>• Observation sessions (10-15 min) twice per week for 4 weeks.</li> </ul>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>Balance, triple beam – 1 for every 4 students <i>or</i> Electronic balance – 1 for class</li> <li>• 4 plastic gallon jugs</li> <li>• Distilled water</li> </ul>

## Grade 7

<b>WEEK 2 (continued)</b>	<p><b>Lesson 7 (45 min) Activity 2: A Pond Ecosystem (2 of 3 sessions)</b></p> <p><b>Objective(s): Students establish a miniature pond ecosystem, observe the organisms over time, and determine how each kind of organism gets nutrients and energy to sustain life.</b></p> <ul style="list-style-type: none"> <li>• Monitor the appearance of different organisms in a miniature pond ecosystem.</li> <li>• Classify the pond organisms as unicellular or multicellular.</li> <li>• Classify the pond organisms according to how they get the energy they need for their survival.</li> <li>• Diagram a simple food chain of pond organisms.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 5</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 23-26 taking note of: <ul style="list-style-type: none"> <li>p. 23 schedule.</li> <li>p. 23 materials.</li> <li>p. 23-25 preparation – Session II.</li> <li>p. 25-26 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 26-30, Steps # 9-11</li> <li>– Copymaster: Activity Sheet 2</li> <li>– Delta Science Reader: pp. 36-39; 9</li> <li>– SRLTTE Teacher Guide: pp. T29-T35; T5-T10</li> <li>– Science at Home: p. 35</li> </ul> <p><b>Note:</b> The class will return to this activity in Lesson 13.</p>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <p>Microscope, compound – 1 for every 4 students</p>

## Grade 7

<b>WEEK 2 (continued)</b>	<p><b>Lesson 8 (45 min) Activity 7: Food Production in Plants (Session 1)</b></p> <p><b>Objective(s): Students determine that plants need both chlorophyll and light to produce food by photosynthesis.</b></p> <ul style="list-style-type: none"> <li>• Test two kinds of plant leaves for the presence of starch (food)</li> <li>• Observe that only the areas of a leaf that contain chlorophyll produce food</li> <li>• Demonstrate that plant leaves make food in light but not in the dark</li> <li>• Conclude that both light energy and chlorophyll are needed for food production in plants</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 4, 8</li> <li>• Living Environment Skills: 4</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d; 6.2a</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 75-77 taking note of: <ul style="list-style-type: none"> <li>p. 75 schedule.</li> <li>p. 75 materials.</li> <li>p. 75-76 preparation.</li> <li>p. 76-77 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 78-83, Steps # 1-8; read ahead to prepare for Steps # 9-13 in Session II.</li> <li>– Copymaster: Activity Sheet 7, Part A</li> <li>– Delta Science Reader: pp. 17; 24-26; 33</li> <li>– SRLTTE Teacher Guide: pp. T11-T17; T24-T28; T29-T35</li> <li>– Science at Home: p. 86</li> </ul> <p><b>Notes:</b> Session 2 should take place about 6 days after Session 1.</p>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Potato</li> <li>• Coleus plant and Geranium plant</li> <li>• Electric hot plate</li> <li>• Distilled water</li> </ul>

## Grade 7

<b>WEEK 2 (continued)</b>	<p><b>Lesson 9 (45 min) Activity 8: Plants and Nitrogen (Session 1)</b></p> <p><b>Objective(s): Students grow radish plants under nitrogen-deficient conditions and determine that plants need nitrogen for healthy growth.</b></p> <ul style="list-style-type: none"> <li>• Observe differences between plants grown with and without nitrogen.</li> <li>• Compare the biomass of plants grown with and without nitrogen.</li> <li>• Construct a graph illustrating the effects of nitrogen deficiency on plant height.</li> <li>• Identify the role of nitrogen in plant growth and development.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 7, 8</li> <li>• Living Environment Skills: 9</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d; 5.2a, 5.2b</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 89-91 taking note of: <ul style="list-style-type: none"> <li>p. 89 schedule.</li> <li>p. 89 materials.</li> <li>p. 89-90 preparation.</li> <li>p. 90 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 91-95, Steps # 1-5; read ahead to prepare for Steps # 6-9 in Session II and Step # 10 in Session III.</li> <li>– Copymaster: Activity Sheet 8, Part A</li> <li>– Delta Science Reader: pp. 1-3; 29-34 SRLTTE Teacher Guide: pp. T1-T4; T29-T35</li> <li>– Science at Home: p. 98</li> </ul> <p><b>Notes:</b> Session II &amp; III take place about 28 days after Session I. Students record observations twice per week for four weeks.</p>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Balance – triple beam 1 per 4 students <i>or</i> Electronic balance</li> <li>• Plastic gallon containers</li> <li>• Distilled water</li> </ul>
<p><b>Refer to Teacher Guide p. 11 for the Advance Preparation for Activities 9, 10, 11, and 12.</b></p>			

## Grade 7

<b>WEEK 2 (continued)</b>	<p><b>Lesson 10 (45 min) Activity 9: Plants Tropisms (Session 1)</b></p> <p><b>Objective(s): Students experiment with plants and determine that roots exhibit positive gravitropism and shoots exhibit positive phototropism.</b></p> <ul style="list-style-type: none"> <li>• Observe the effect of gravity on the growth of plant roots.</li> <li>• Observe the effect of light on the growth of plant shoots.</li> <li>• Infer the reasons why different plant parts respond as they do to external stimuli.</li> <li>• Recognize that the survival of a plant depends on its ability to sense and respond to its external environment.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 8</li> <li>• Living Environment Skills:</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d, 5.1g; 6.2a</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 101-103 taking note of: <ul style="list-style-type: none"> <li>p. 101 schedule.</li> <li>p. 101 materials.</li> <li>p. 101-102 preparation.</li> <li>p. 102 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 103-105, Steps # 1-5; read ahead to prepare for Session II, Steps # 6-9; Session III, Steps #10-11 and Session IV, Steps # 12-13.</li> <li>– Copymaster: Activity Sheet 9, Part A</li> <li>– Delta Science Reader: pp. 1-3; 24-26; 29-35</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T24-T28; T29-T35</li> <li>– Science at Home: p. 110</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Session 2 takes place about 3-5 days after Session 1.</li> <li>• 10-minute Observations are recorded every day.</li> <li>• Session 3 takes place about 7 days after Session 2.</li> <li>• 10-minute Observations are recorded every other day.</li> <li>• Session 4 takes place about 4 days after Session 3.</li> </ul>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Cardboard box</li> <li>• Plastic gallon containers</li> <li>• A grow light may be needed if your classroom does not have strong natural light.</li> </ul>

## Grade 7

<b>WEEK 3</b>	<p><b>Lesson 11 (45 min) Activity 7: Food Production in Plants (Session 2)</b></p> <p><b>Objective(s): Students determine that plants need both chlorophyll and light to produce food by photosynthesis.</b></p> <ul style="list-style-type: none"> <li>• Test two kinds of plant leaves for the presence of starch (food).</li> <li>• Observe that only the areas of a leaf that contain chlorophyll produce food.</li> <li>• Demonstrate that plant leaves make food in light but not in the dark.</li> <li>• Conclude that both light energy and chlorophyll are needed for food production in plants.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 4, 8</li> <li>• Living Environment Skills: 4</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d; 6.2a</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 75-77 taking note of: <ul style="list-style-type: none"> <li>p. 75 schedule.</li> <li>p. 75 materials.</li> <li>p. 75-76 preparation.</li> <li>p. 76-77 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 83-86, Steps # 9-13</li> <li>– Copymaster: Activity Sheet 7, Part B</li> <li>– Delta Science Reader: pp. 17; 24-26; 33</li> <li>– SRLTTE Teacher Guide: pp. T11-T17; T24-T28; T29-T35</li> <li>– Science at Home: p. 86</li> </ul> <p><b>Note:</b> Session 2 should take place about 6 days after Session 1.</p>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Coleus plant and Geranium plant</li> <li>• Electric hot plate</li> <li>• Distilled water</li> </ul>

## Grade 7

<b>WEEK 3 (continued)</b>	<p><b>Lesson 12 (45 min) Activity 9: Plant Tropisms (Session 2)</b></p> <p><b>Objective(s): Students experiment with plants and determine that roots exhibit positive gravitropism and shoots exhibit positive phototropism.</b></p> <ul style="list-style-type: none"> <li>• Observe the effect of gravity on the growth of plant roots.</li> <li>• Observe the effect of light on the growth of plant shoots.</li> <li>• Infer the reasons why different plant parts respond as they do to external stimuli.</li> <li>• Recognize that the survival of a plant depends on its ability to sense and respond to its external environment.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 8</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d, 5.1g; 6.2a</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 101-103 taking note of: <ul style="list-style-type: none"> <li>p. 101 schedule.</li> <li>p. 101 materials.</li> <li>p. 101-102 preparation.</li> <li>p. 102 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 105-108, Steps # 6-9; read ahead to prepare for Session III, Steps #10-11 and Session IV, Steps # 12-13.</li> <li>– Copymaster: Activity Sheet 9, Part A</li> <li>– Delta Science Reader: pp. 1-3; 24-26; 29-35</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T24-T28; T29-T35</li> <li>– Science at Home: p. 110</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• 10-minute Observations are recorded every day.</li> <li>• Session 3 takes place about 7 days after Session 2.</li> <li>• 10-minute Observations are recorded every other day.</li> <li>• Session 4 takes place about 4 days after Session 3.</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Cardboard box</li> <li>• Plastic gallon containers</li> <li>• A grow light may be needed if your classroom does not have strong natural light.</li> </ul>

## Grade 7

<b>WEEK 3 (continued)</b>	<p><b>Lesson 13 (45 min) Activity 2: A Pond Ecosystem (3 of 3 sessions)</b></p> <p><b>Objective(s):</b> Students establish a miniature pond ecosystem, observe the organisms over time, and determine how each kind of organism gets nutrients and energy to sustain life.</p> <ul style="list-style-type: none"> <li>• Monitor the appearance of different organisms in a miniature pond ecosystem.</li> <li>• Classify the pond organisms as unicellular or multicellular.</li> <li>• Classify the pond organisms according to how they get the energy they need for their survival.</li> <li>• Diagram a simple food chain of pond organisms.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 5</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 23-26 taking note of:             <ul style="list-style-type: none"> <li>p. 23 schedule.</li> <li>p. 23 materials.</li> <li>p. 23-25 preparation – Session II.</li> <li>p. 25-26 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 31-34, Steps # 12-16</li> <li>– Copymaster: Activity Sheet 2</li> <li>– Delta Science Reader: pp. 36-39; 9</li> <li>– SRLTTE Teacher Guide: pp. T36-T39; T5-T10</li> <li>– Science at Home: p. 35</li> </ul> <p><b>Note:</b> You may wish to maintain this Pond Life culture for future viewing and use.</p>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <p>Microscope, compound – 1 for every 4 students</p>
	<p><b>Check <i>Euglena</i> culture to determine if the density of the culture is sufficiently concentrated. See page 121 of the Teacher Guide.</b></p>		

## Grade 7

<b>WEEK 3 (continued)</b>	<b>Lesson 14 (45 min) Activity 9: Plant Tropisms (Session 3)</b>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 8</li> <li>• Living Environment Skills:</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d, 5.1g; 6.2a</li> </ul>
	<b>Objective(s): Students experiment with plants and determine that roots exhibit positive gravitropism and shoots exhibit positive phototropism.</b> <ul style="list-style-type: none"> <li>• Observe the effect of gravity on the growth of plant roots.</li> <li>• Observe the effect of light on the growth of plant shoots.</li> <li>• Infer the reasons why different plant parts respond as they do to external stimuli.</li> <li>• Recognize that the survival of a plant depends on its ability to sense and respond to its external environment.</li> </ul>		
	<b>Advanced Planning/Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 101-103 taking note of: <ul style="list-style-type: none"> <li>p. 101 schedule.</li> <li>p. 101 materials.</li> <li>p. 101-102 preparation.</li> <li>p. 102 background information.</li> </ul> </li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 108-109, Steps #10-11 read ahead to prepare for Session IV, Steps # 12-13.</li> <li>– Copymaster: Activity Sheet 9, Part B</li> <li>– Delta Science Reader: pp. 1-3; 24-26; 29-35</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T24-T28; T29-T35</li> <li>– Science at Home: p. 110</li> </ul> <b>Notes:</b> <ul style="list-style-type: none"> <li>• 10-minute Observations are recorded every other day.</li> <li>• Session 4 takes place about 4 days after Session 3.</li> </ul>	<b>Science Materials Supplied by the Teacher</b> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Cardboard box</li> <li>• Plastic gallon containers</li> <li>• A grow light may be needed if your classroom does not have strong natural light.</li> </ul>

Grade 7

<b>WEEK 3 (continued)</b>	<p><b>Lesson 15 (45 min) Activity 9: Plant Tropisms (Session 4)</b></p> <p><b>Objective(s): Students experiment with plants and determine that roots exhibit positive gravitropism and shoots exhibit positive phototropism.</b></p> <ul style="list-style-type: none"> <li>• Observe the effect of gravity on the growth of plant roots.</li> <li>• Observe the effect of light on the growth of plant shoots.</li> <li>• Infer the reasons why different plant parts respond as they do to external stimuli.</li> <li>• Recognize that the survival of a plant depends on its ability to sense and respond to its external environment.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 8</li> <li>• Living Environment Skills:</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d, 5.1g; 6.2a</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 101-103 taking note of: <ul style="list-style-type: none"> <li>p. 101 schedule.</li> <li>p. 101 materials.</li> <li>p. 101-102 preparation.</li> <li>p. 102 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 109-110, Steps # 12-13</li> <li>– Copymaster: Activity Sheet 9, Part B</li> <li>– Delta Science Reader: pp. 1-3; 24-26; 29-35</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T24-T28; T29-T35</li> <li>– Science at Home: p. 110</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• 10-minute Observations are recorded every other day.</li> <li>• Session 4 takes place about 4 days after Session 3.</li> </ul>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Cardboard box</li> <li>• Plastic gallon containers</li> <li>• A grow light may be needed if your classroom does not have strong natural light.</li> </ul>

## Grade 7

<b>WEEK 4</b>	<p><b>Lesson 16 (45 min) Activity 10: Animal Responses to the Environment (Session 1)</b></p> <p><b>Objective(s): Students investigate the behavior of sowbugs in response to stimuli in their external environment.</b></p> <ul style="list-style-type: none"> <li>• Observe the behavior of sowbugs.</li> <li>• Determine wet or dry habitat preference in sowbugs.</li> <li>• Graph the location of sowbugs in wet and in dry habitats over time.</li> <li>• Recognize that the survival of an animal depends on its ability to sense and respond to its external environment.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 4, 7, 8</li> <li>• Living Environment Skills: 9</li> <li>• Living Environment: 1.1d, 1.1g, 5.1a, 5.1b, 5.1f, 5.1g;</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 113-114 taking note of: <ul style="list-style-type: none"> <li>p. 113 schedule.</li> <li>p. 113 materials.</li> <li>p. 113-114 preparation.</li> <li>p. 114 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 115, Steps # 1-4</li> <li>– Copymaster: Activity Sheet 10, Part A</li> <li>– Delta Science Reader: pp. 2-4; 27</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T24-T28</li> <li>– Science at Home: p. 119</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• 10-minute Observations are recorded every other day.</li> <li>• Session 4 takes place about 4 days after Session 3.</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Graph paper</li> <li>• Color pencils: red, green blue</li> <li>• Clock / watch / stopwatch to count seconds</li> </ul>

## Grade 7

<b>WEEK 4 (continued)</b>	<p><b>Lesson 17 (45 min) Activity 10: Animal Responses to the Environment (Session 2)</b></p> <p><b>Objective(s): Students investigate the behavior of sowbugs in response to stimuli in their external environment.</b></p> <ul style="list-style-type: none"> <li>• Observe the behavior of sowbugs.</li> <li>• Determine wet or dry habitat preference in sowbugs.</li> <li>• Graph the location of sowbugs in wet and in dry habitats over time.</li> <li>• Recognize that the survival of an animal depends on its ability to sense and respond to its external environment.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 4, 7, 8</li> <li>• Living Environment Skills: 9</li> <li>• Living Environment: 1.1d, 1.1g, 5.1a, 5.1b, 5.1f, 5.1g</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 113-114 taking note of:             <ul style="list-style-type: none"> <li>p. 113 schedule.</li> <li>p. 113 materials.</li> <li>p. 113-114 preparation.</li> <li>p. 114 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 115-118, Steps # 5-10</li> <li>– Copymaster: Activity Sheet 10, Part B</li> <li>– Delta Science Reader: pp. 2-4; 27</li> <li>– SRLTTE Teacher Guide: pp. T2-T4; T24-T28</li> <li>– Science at Home: p. 119</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Graph paper</li> <li>• Color pencils: red, green blue</li> <li>• Clock / watch / stopwatch to count seconds</li> </ul>
	<p><b>Determine if you will continue to Activity 11: <i>Euglena</i> and Light and Activity 12: <i>Euglena</i> and Other Stimuli or complete Activity 6: Plants and Pollution and Activity 8: Plants and Nitrogen.</b></p>		

## Grade 7

<b>WEEK 4 (continued)</b>	<p><b>Lesson 18 (45 min) Activity 11: <i>Euglena</i> and Light (Session 1)</b></p> <p><b>Objective(s):</b> Students observe <i>Euglena</i>'s response to light and relate that behavior to the organisms' need for light energy in order to make food.</p> <ul style="list-style-type: none"> <li>Investigate the effect of light on a <i>Euglena</i> culture.</li> <li>Hypothesize why <i>Euglena</i> responds to light.</li> <li>Identify <i>Euglena</i> as a unicellular organism.</li> </ul>	<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>General Skills: 1, 2, 3, 4, 7, 8</li> <li>Living Environment Skills: 1, 2, 3, 9</li> <li>Living Environment: 1.1d, 5.1a, 5.1b, 5.1d, 5.1f, 5.1g; 5.2a, 5.2c</li> </ul>
	<p><b>Advanced Planning/Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>Teacher Guide, p. 11</li> <li>Teacher Guide, pp. 121-123 taking note of: <ul style="list-style-type: none"> <li>p. 121 schedule.</li> <li>p. 121 materials.</li> <li>p. 121-122 preparation.</li> <li>p. 122-123 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Teacher Guide: Guiding the Activity, pp. 123-126, Steps # 1-6</li> <li>Copymaster: Activity Sheet 11, Part A</li> <li>Delta Science Reader: pp. 17; 24-26; 37-39</li> <li>SRLTTE Teacher Guide: pp. T11-T17; T24-T28; T36-T39</li> <li>Science at Home: p. 128</li> </ul>

## Grade 7

<b>WEEK 4 (continued)</b>	<p><b>Lesson 19 (45 min) Activity 11: <i>Euglena</i> and Light (Session 2)</b></p> <p><b>Objective(s): Students observe <i>Euglena</i>'s response to light and relate that behavior to the organisms' need for light energy in order to make food.</b></p> <ul style="list-style-type: none"> <li>Investigate the effect of light on a <i>Euglena</i> culture.</li> <li>Hypothesize why <i>Euglena</i> responds to light.</li> <li>Identify <i>Euglena</i> as a unicellular organism.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>General Skills: 1, 2, 3, 4, 7, 8</li> <li>Living Environment Skills: 1, 2, 3, 9</li> <li>Living Environment: 1.1d, 5.1a, 5.1b, 5.1d, 5.1f, 5.1g; 5.2a, 5.2c</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>Teacher Guide, p. 11</li> <li>Teacher Guide, pp. 121-123 taking note of: <ul style="list-style-type: none"> <li>p. 121 schedule.</li> <li>p. 121 materials.</li> <li>p. 121-122 preparation.</li> <li>p. 122-123 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>Teacher Guide: Guiding the Activity, pp. 123-126, Steps # 7-10</li> <li>Copymaster: Activity Sheet 11, Part B</li> <li>Delta Science Reader: pp. 17; 24-26; 37-39</li> <li>SRLTTE Teacher Guide: pp. T11-T17; T24-T28; T36-T39</li> <li>Science at Home: p. 128</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>Microscope, compound – 1 for every 4 students</li> <li>Hole punch</li> <li>Light source</li> <li>Overhead projector</li> </ul>

## Grade 7

<b>WEEK 4 (continued)</b>	<p><b>Lesson 20 (45 min) Activity 12: Euglena and Other Stimuli (Session 1)</b></p> <p><b>Objective(s): Students design and carry out an experiment to investigate <i>Euglena</i>'s responses to an external stimulus.</b></p> <ul style="list-style-type: none"> <li>• Observe a method for testing <i>Euglena</i>'s response to a chemical stimulus.</li> <li>• Formulate a hypothesis about how <i>Euglena</i> will respond to an external stimulus.</li> <li>• Design and carry out an experiment to determine how <i>Euglena</i> responds to the stimulus.</li> <li>• Infer the reason for <i>Euglena</i>'s behavioral response.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 3, 4, 7, 8</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d, 5.1b, 5.1c, 5.1d, 5.1f, 5.1g;</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 131-133 taking note of: <ul style="list-style-type: none"> <li>p. 131 schedule.</li> <li>p. 131 materials.</li> <li>p. 131-132 preparation.</li> <li>p. 132 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 133-137, Steps # 1-8</li> <li>– Copymaster: Activity Sheet 12, Part A</li> <li>– Delta Science Reader: pp. 37-39</li> <li>– SRLTTE Teacher Guide: pp. T36-T39</li> <li>– Science at Home: p. 139</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Microscope, compound – 1 for every 4 students</li> <li>• Insulated container</li> <li>• Ice chips</li> <li>• Overhead projector</li> <li>• Distilled water</li> </ul>

## Grade 7

<b>WEEK 5</b>	<p><b>Lesson 21 (45 min) Activity 12: Euglena and Other Stimuli (Session 2)</b></p> <p><b>Objective(s): Students design and carry out an experiment to investigate <i>Euglena</i>'s responses to and external stimulus.</b></p> <ul style="list-style-type: none"> <li>• Observe a method for testing <i>Euglena</i>'s response to a chemical stimulus.</li> <li>• Formulate a hypothesis about how <i>Euglena</i> will respond to and external stimulus.</li> <li>• Design and carry out an experiment to determine how <i>Euglena</i> responds to the stimulus.</li> <li>• Infer the reason for <i>Euglena</i>'s behavioral response.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 3, 4, 7, 8</li> <li>• Living Environment Skills: 1, 2, 3, 9</li> <li>• Living Environment: 1.1d, 5.1b, 5.1c, 5.1d, 5.1f, 5.1g;</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 131-133 taking note of:             <ul style="list-style-type: none"> <li>p. 131 schedule.</li> <li>p. 131 materials.</li> <li>p. 131-132 preparation.</li> <li>p. 132 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>• Teacher Guide: Guiding the Activity, pp. 137-139, Steps # 9-13</li> <li>• Copymaster: Activity Sheet 12, Part B</li> <li>• Delta Science Reader: pp. 37-39</li> <li>• SRLTTE Teacher Guide: pp. T36-T39</li> <li>• Science at Home: p. 139</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Microscope, compound – 1 for every 4 students</li> <li>• Insulated container</li> <li>• Ice chips</li> <li>• Overhead projector</li> <li>• Distilled water</li> </ul>

## Grade 7

<b>WEEK 5 (continued)</b>	<b>Lesson 22 (45 min) Activity 6: Plants and Pollutions (Session 2)</b> <b>Objective(s): Students investigate the effect of chemical pollutants on the growth of radish seedlings.</b> <ul style="list-style-type: none"> <li>Observe the effects of different environmental pollutants on the growth of established radish seedlings.</li> <li>Compare the mass of seedlings exposed to pollutants with the mass of a control group.</li> <li>Construct graphs illustrating the effects of pollution on the growth rate of radish seedlings.</li> <li>Conclude that environmental pollutants can influence a plant's growth and development.</li> </ul>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>General Skills: 1, 3, 4, 7, 8</li> <li>Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d, 5.1g; 5.2c, 5.2e</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>Teacher Guide, p. 11</li> <li>Teacher Guide, pp. 63-65 taking note of: <ul style="list-style-type: none"> <li>p. 63 schedule.</li> <li>p. 63 materials.</li> <li>p. 63-64 preparation.</li> <li>p. 64-65 background information.</li> </ul> </li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>Teacher Guide: Guiding the Activity, pp. 70-72, Steps # 9-12</li> <li>Copymaster: Activity Sheet 6, Part B</li> <li>Delta Science Reader: pp. 2-4; 29-34 SRLTTE Teacher Guide: pp. T1-T4; T29-T35</li> <li>Science at Home: p. 73</li> </ul>	<b>Science Materials Supplied by the Teacher</b> <ul style="list-style-type: none"> <li>Safety goggles</li> <li>Balance, triple beam – 1 per 4 students <i>or</i> Electronic balance – 1 for class</li> <li>4 plastic gallon jugs</li> <li>Distilled water</li> </ul>

## Grade 7

<b>WEEK 5 (continued)</b>	<p><b>Lesson 23 (45 min) Activity 8: Plants and Nitrogen (Session 2)</b></p> <p><b>Objective(s): Students grow radish plants under nitrogen-deficient conditions and determine that plants need nitrogen for healthy growth.</b></p> <ul style="list-style-type: none"> <li>• Observe differences between plants grown with and without nitrogen.</li> <li>• Compare the biomass of plants grown with and without nitrogen.</li> <li>• Construct a graph illustrating the effects of nitrogen deficiency on plant height.</li> <li>• Identify the role of nitrogen in plant growth and development.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 7, 8</li> <li>• Living Environment Skills: 9</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d; 5.2a, 5.2b</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 89-91 taking note of: <ul style="list-style-type: none"> <li>p. 89 schedule.</li> <li>p. 89 materials.</li> <li>p. 89-90 preparation.</li> <li>p. 90 background information.</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 95-96, Steps # 6-9 read ahead to prepare for Step # 10 in Session 3</li> <li>– Copymaster: Activity Sheet 8, Part B</li> <li>– Delta Science Reader: pp. 1-3; 29-34</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T29-T35</li> <li>– Science at Home: p. 98</li> </ul> <p><b>Notes:</b> Session 3 takes place about 28 days after Session 1. Students record observations twice per week for four weeks.</p>	<p style="text-align: center;"><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Safety goggles</li> <li>• Balance – triple beam 1 per 4 students <i>or</i> Electronic balance</li> <li>• Plastic gallon containers</li> <li>• Distilled water</li> </ul>

## Grade 7

<b>WEEK 5 (continued)</b>	<p><b>Lesson 24 (45 min) Activity 8: Plants and Nitrogen (Session 3)</b></p> <p><b>Objective(s): Students grow radish plants under nitrogen-deficient conditions and determine that plants need nitrogen for healthy growth.</b></p> <ul style="list-style-type: none"> <li>• Observe differences between plants grown with and without nitrogen.</li> <li>• Compare the biomass of plants grown with and without nitrogen.</li> <li>• Construct a graph illustrating the effects of nitrogen deficiency on plant height.</li> <li>• Identify the role of nitrogen in plant growth and development.</li> </ul>		<p><b>Alignment with NYS Core Curriculum:</b></p> <ul style="list-style-type: none"> <li>• General Skills: 1, 2, 3, 4, 7, 8</li> <li>• Living Environment Skills: 9</li> <li>• Living Environment: 1.1d, 1.1f, 5.1a, 5.1b, 5.1c, 5.1d; 5.2a, 5.2b</li> </ul>
	<p><b>Advanced Planning/ Notes to Teachers</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide, p. 11</li> <li>– Teacher Guide, pp. 89-91 taking note of: <ul style="list-style-type: none"> <li>p. 89 schedule.</li> <li>p. 89 materials.</li> <li>p. 89-90 preparation.</li> <li>p. 90 background information.</li> </ul> </li> </ul>	<p><b>Investigation/Activity</b></p> <ul style="list-style-type: none"> <li>– Teacher Guide: Guiding the Activity, pp. 97, Steps # 10</li> <li>– Copymaster: Activity Sheet 8, Part B</li> <li>– Delta Science Reader: pp. 1-3; 29-34</li> <li>– SRLTTE Teacher Guide: pp. T1-T4; T29-T35</li> <li>– Science at Home: p. 98</li> </ul>	<p><b>Science Materials Supplied by the Teacher</b></p> <ul style="list-style-type: none"> <li>• Graph paper</li> <li>• Balance – triple beam 1 per 4 students or Electronic balance</li> <li>• Plastic gallon containers</li> <li>• Distilled water</li> </ul>

## Grade 7

WEEK 5 (continued)

**Lesson 25 (45 min) Assessment**

**Objective(s):** Measure student understanding of the content material presented in *Living Things in Their Environment*.

**Section 1: Hands On**

**Students:**

- observe two leaves and predict which has been exposed to more sunlight.
- recall and implement a test to confirm or refute their prediction.
- record and analyze results of their test.

**Section 2: Visual Analysis**

**Students:**

- label the parts of a plant cell.
- apply their knowledge of osmosis to label the direction of water flow in a diagram.
- correct and label pictures of phototropism and gravitropism.

**Section 3: Critical Thinking**

**Students:**

- infer the effects of salt pollution on plant and animal populations.
- explain why producers are likely to be found near the surface of a pond.
- explain why plants need nutrients even though they produce food.
- analyze data about the habitat preference of earthworms.

**Alignment with NYS Core Curriculum:**

- General Skills: 1, 4, 7, 8
- Living Environment Skills: 4, 6
- Living Environment: 1.1d, 1.1f, 1.1g, 5.1a, 5.1b, 5.1d, 5.1f, 5.1g;

**Advanced Planning/  
Notes to Teachers**

- Teacher Guide, p. ix
- Teacher Guide, pp. 141-143 taking note of:
  - p. 141 schedule.
  - p. 141 materials.
  - p. 141-142 preparation.
  - p. 142 background information.
  - p. 142-143 assessment procedure.
  - p. 143 scoring.

**Investigation/Activity**

- Teacher Guide: Guiding the Assessment, pp. 144-146
- Copymasters:
  - Assessment Activity Sheets 1, 2A, 2B, 3A, 3B
  - Assessment Summary Chart

**Science Materials Supplied  
by the Teacher**

- Clock or watch with a second hand / stopwatch
- Geranium plant
- Alcohol bath as in Activity 7
- Safety goggles

## Grade 7

<b>WEEK 6</b>	<b>Lesson 26 (45 min)</b> <b>Objective(s): Science Vocabulary and Content</b>		<b>Alignment with NYS Core Curriculum:</b> <ul style="list-style-type: none"> <li>• General Skills:</li> <li>• Living Environment Skills: 1</li> <li>• Living Environment: 1.1d, 5.1c, 5.1d, 5.1f, 5.1g; 6.2a</li> </ul>
	<b>Advanced Planning/ Notes to Teachers</b> <ul style="list-style-type: none"> <li>– Teacher Guide, p. ix</li> <li>– Teacher Guide, pp. 149-150</li> </ul>	<b>Investigation/Activity</b> <ul style="list-style-type: none"> <li>– Teacher Guide: Unit Test, pp. 149-150</li> <li>– Copymaster: Unit Test, Part A, Part B (4 pp.)</li> </ul>	<b>Science Materials Supplied by the Teacher</b>