




# Preparation Guide


## Level 1 Module 2

### ENVIRONMENTS

#### with Spotlight Lessons on Water

**Materials:** This section lists the quantity of each material necessary for the lesson. Lesson materials may be from a *PhD Science® Texas* materials kit, or the materials may be school-supplied items. In addition to having the listed materials, teachers should have access to the following common classroom items: sticky notes, chart paper, pencils, a whiteboard, and markers.

**Resources:** This section lists module resources (from the Module Resources section in the Teacher Edition) and core texts used in the lesson. Classrooms also need daily access to the module's Teacher Edition, Science Logbooks, and, if applicable, digital slides. A symbol () identifies resources that appear in the digital slides. Additional supports and Spanish resources are available in the Implementation Resources and Level Overview sections of the digital platform.

**Preparation:** This section identifies preparation teachers should complete before the lesson, including media teachers must cue before the lesson and activities that require setup. This section also describes advance preparation for upcoming lessons. For example, if teachers need to prepare 1 day in advance for an activity in Lesson 11, an advance preparation note appears in the Preparation section for Lesson 10. A symbol () identifies lessons with advance preparation notes.

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## Environments | Advance Preparation

Some activities in this module require advance preparation. See the lesson resources for more details on material preparation and instructions. A version of this list appears in the Module Overview of the Teacher Edition. The expanded version in this guide identifies all lessons for which preparation may take longer than a planning period. A symbol (†) identifies preparation that can be done earlier than the suggested time.


Lesson	Time in Advance	Investigation	Description
19	1–3 Days	Examine Classroom Trash Activity	Collect and store the trash and recycling generated by the class for 1–3 days. Remove dangerous or unsanitary materials.
21	1 Week†	Engineering Challenge	Begin to collect the six kinds of paper needed for Engineering Challenge demonstrations and activities—printer paper, newspaper, card stock, tissue paper, construction paper, and paper bag paper. The collected paper may be used or new. Avoid glossy paper and dyed paper.
22	1 Week†	Engineering Challenge	Begin to collect toilet paper tubes (13).

# Environments | Lesson Preparation


## Lesson 1

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> None</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 2 requires the class chart from Lesson 1</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 1 Resource A: Gopher Tortoise Photograph </p> <p><input type="checkbox"/> Lesson 1 Resource B: North America Map </p> <p><input type="checkbox"/> Lesson 1 Resource C: Gopher Tortoise Data </p>
<b>Preparation</b>	<p><input type="checkbox"/> Cue gopher tortoise environment video (<a href="http://phdsci.link/1785">http://phdsci.link/1785</a>). </p>





## Lesson 2

<b>Materials</b>	<p><b>Kit Items</b> <input type="checkbox"/> Sticky note arrows (144)</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Glue or tape <input type="checkbox"/> Scissors (1)</p> <p><b>Prepared Items from Previous Lessons</b> <input type="checkbox"/> The class chart started in Lesson 1.</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 2 Resource A: Photographs of Living Things</p> <p><input type="checkbox"/> Lesson 2 Resource B: Class Photographs of Living Things Cards</p> <p><input type="checkbox"/> <i>At Home with the Gopher Tortoise: The Story of a Keystone Species</i> (Dunphy and Rothman 2010)</p>
<b>Preparation</b>	<p><input type="checkbox"/> Cue gopher tortoise environment video (<a href="http://phdsci.link/1785">http://phdsci.link/1785</a>). </p> <p><input type="checkbox"/> Prepare photographs of living things. (See Lesson 2 Resource A.)</p> <p><input type="checkbox"/> Prepare class photographs of living things cards. (See Lesson 2 Resource B.)</p>





## Lesson 3

<b>Materials</b>	<b>Kit Items</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class anchor model components           <ul style="list-style-type: none"> <li>○ Background image (1)</li> <li>○ Florida mouse stickers (2)</li> <li>○ Gopher tortoise stickers (2)</li> <li>○ Indigo snake stickers (2)</li> <li>○ Longleaf pine stickers (5)</li> <li>○ Red-cockaded woodpecker stickers (2)</li> <li>○ Wiregrass stickers (6)</li> </ul> </li> </ul> <b>School-Supplied Items</b> None
<b>Resources</b>	<input type="checkbox"/> Lesson 1 Resource C: Gopher Tortoise Data  <input type="checkbox"/> Lesson 3 Resource: Anchor Model Progression Reference
<b>Preparation</b>	<input type="checkbox"/> For guidance on the progression of the student anchor model and class anchor model, review the anchor model progression reference. (See Lesson 3 Resource.) <input type="checkbox"/> If not using the Module 2 kit, refer to the sample images in the anchor model progression reference to draw the anchor model. (See Lesson 3 Resource.)



## Lesson 4

<b>Materials</b>	<b>Kit Items</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clay, modeling, nonhardening (<math>\frac{1}{4}</math> lb)</li> <li><input type="checkbox"/> Paper umbrellas (54)</li> </ul> <b>Module 1 Kit</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> </ul> <b>School-Supplied Items</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Paper, printer, 8.5" x 11" (12 sheets)</li> </ul> <b>Item Reuse</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 5 requires 36 of the paper umbrellas, 1 of the student forest models with trees close together, and 1 of the student forest models with trees far apart.</li> </ul>
<b>Resources</b>	<input type="checkbox"/> Lesson 1 Resource B: North America Map  <input type="checkbox"/> Lesson 4 Resource A: Wiregrass Photograph  <input type="checkbox"/> Lesson 4 Resource B: Forest Overhead View Drawings  <input type="checkbox"/> Lesson 4 Resource C: Forest Model Classroom Procedures
<b>Preparation</b>	<input type="checkbox"/> Cue forest flyover video ( <a href="http://phdsci.link/1800">http://phdsci.link/1800</a> ).  <input type="checkbox"/> Gather materials for forest models. (See Lesson 4 Resource C.) Prepare one 1" diameter ball of modeling clay for each student pair modeling trees close together. Prepare one 0.5" diameter ball of modeling clay for each student pair modeling trees far apart.



## Lesson 5

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clay, modeling, nonhardening (<math>\frac{1}{4}</math> lb)</li> <li><input type="checkbox"/> Flashlights with batteries (6)</li> <li><input type="checkbox"/> Paper umbrellas (36)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Books or other objects (6 sets, optional)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student forest models from Lesson 4 (1 with trees close together and 1 with trees far apart)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 6 requires 1 of the student forest models with trees close together and 1 of the student forest models with trees far apart.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 4 Resource A: Wiregrass Photograph </li> <li><input type="checkbox"/> Lesson 4 Resource C: Forest Model Classroom Procedures</li> <li><input type="checkbox"/> Lesson 5 Resource A: Bean Plant Photograph </li> <li><input type="checkbox"/> Lesson 5 Resource B: Shadow Photograph </li> <li><input type="checkbox"/> Lesson 5 Resource C: Grid Paper Shadow Photograph </li> <li><input type="checkbox"/> Lesson 5 Resource D: Wiregrass Grid Paper</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Gather materials for sunlit forest models. (See Lesson 4 Resource C.) Prepare one 1" diameter ball of modeling clay for each group. Prepare to distribute a copy of Lesson 5 Resource D to each group.</li> </ul>



## Lesson 6

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class anchor model components             <ul style="list-style-type: none"> <li><input type="radio"/> Sun sticker (1)</li> <li><input type="radio"/> Wiregrass stickers (2)</li> </ul> </li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sentence strips (4)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pocket chart (1)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student forest models from Lesson 4 (1 with trees close together and 1 with trees far apart)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 6 Resource: Forest Floor Photographs </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue forest flyover video (<a href="http://phdsci.link/1800">http://phdsci.link/1800</a>). </li> </ul>


## Lesson 7

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Scissors (1)</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 9 requires the prepared forest dangers class chart.</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 1 Resource A: Gopher Tortoise Photograph </p> <p><input type="checkbox"/> Lesson 7 Resource A: Animal Shelter Photographs </p> <p><input type="checkbox"/> Lesson 7 Resource B: Gopher Tortoise Figures</p>
<b>Preparation</b>	<input type="checkbox"/> Prepare gopher tortoise figures. (See Lesson 7 Resource B.)



## Lesson 8

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student anchor model components <ul style="list-style-type: none"> <li>○ Background image (12)</li> <li>○ Gopher tortoise stickers (12)</li> <li>○ Longleaf pine stickers (36)</li> <li>○ Sun stickers (12)</li> <li>○ Wiregrass stickers (96)</li> </ul> </li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Markers, dry erase, black (12)</li> <li><input type="checkbox"/> Paper towels (12 sheets)</li> </ul> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 9 requires the student anchor models.</p>
<b>Resources</b>	None
<b>Preparation</b>	<input type="checkbox"/> Cue gopher tortoise environment video from Lesson 1 ( <a href="http://phdsci.link/1785">http://phdsci.link/1785</a> )  and gopher tortoise shelter video ( <a href="http://phdsci.link/1803">http://phdsci.link/1803</a> ). 



## Lesson 9

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student anchor model components             <ul style="list-style-type: none"> <li>○ Florida mouse stickers (12)</li> <li>○ Indigo snake stickers (12)</li> </ul> </li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Markers, dry erase, black (12)</li> <li><input type="checkbox"/> Paper towels (12 sheets)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Forest dangers class chart started in Lesson 7 (1)</li> <li><input type="checkbox"/> Student anchor models from Lesson 8 (12)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 12 requires the student anchor models.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>At Home with the Gopher Tortoise: The Story of a Keystone Species</i></li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue other animals in gopher tortoise burrow video (<a href="http://phdsci.link/1830">http://phdsci.link/1830</a>). </li> </ul>




## Lesson 10

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class anchor model component, burrow sticker (1)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sentence strips (2)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Paper towel (1 sheet)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 1 Resource C: Gopher Tortoise Data </li> <li><input type="checkbox"/> <i>At Home with the Gopher Tortoise: The Story of a Keystone Species</i></li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue gopher tortoise environment video from Lesson 1 (<a href="http://phdsci.link/1785">http://phdsci.link/1785</a>). </li> </ul>



## Lesson 11

<b>Materials</b>	<p><b>Kit Items</b></p> <p>None</p> <p><b>School-Supplied Items</b></p> <p>None</p>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 11 Resource A: Garden Photographs </li> <li><input type="checkbox"/> Lesson 11 Resource B: Sunflower Plant and Lettuce Plant Photographs </li> <li><input type="checkbox"/> Lesson 11 Resource C: Conceptual Checkpoint</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare to distribute a color copy of Lesson 11 Resource C to each student.</li> </ul>




## Lesson 12

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Knowledge Deck™ cards, Disappearing Longleaf Pine Forests (24)</li> <li><input type="checkbox"/> Knowledge Deck poster, Disappearing Longleaf Pine Forests (1)</li> <li><input type="checkbox"/> Magnifiers, handheld, plastic (12)</li> <li><input type="checkbox"/> Student anchor model component, city building stickers (12)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Markers, dry erase, black (12)</li> <li><input type="checkbox"/> Paper towels (12 sheets)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Tape (partial roll)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student anchor models from Lesson 9 (12)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 13 requires the student anchor models.</li> <li><input type="checkbox"/> Lesson 15 requires the prepared plant and animal cards.</li> <li><input type="checkbox"/> Lesson 19 requires the Disappearing Longleaf Pine Forests Knowledge Deck poster.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 12 Resource A: USS <i>Constitution</i> Engraving </li> <li><input type="checkbox"/> Lesson 12 Resource B: Tallahassee Photographs </li> <li><input type="checkbox"/> Lesson 12 Resource C: Black and White Longleaf Pine Forest Photograph </li> <li><input type="checkbox"/> Lesson 12 Resource D: Plant and Animal Cards</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare plant and animal cards. (See Lesson 12 Resource D.)</li> </ul>

## Lesson 13



<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student anchor model components             <ul style="list-style-type: none"> <li>○ Florida mouse stickers (12)</li> <li>○ Gopher tortoise stickers (12)</li> <li>○ Indigo snake stickers (12)</li> <li>○ Longleaf pine stickers (108)</li> <li>○ Red-cockaded woodpecker stickers (12)</li> <li>○ Wiregrass stickers (60)</li> </ul> </li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Markers, dry erase, black (12)</li> <li><input type="checkbox"/> Paper towels (12 sheets)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student anchor models from Lesson 12 (12)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 16 requires the student anchor model background and stickers.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 6 Resource: Forest Floor Photographs </li> <li><input type="checkbox"/> Lesson 13 Resource: Farm Photographs </li> </ul>
<b>Preparation</b>	None

## Lesson 14





<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class anchor model component, longleaf pine stickers (4)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sentence strips (2)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Marker, dry erase, black (1)</li> <li><input type="checkbox"/> Paper towel (1)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 14 Resource A: Longleaf Pine Forest Maps </li> <li><input type="checkbox"/> Lesson 14 Resource B: Forest Model Photographs </li> </ul>
<b>Preparation</b> 	<p>None</p> <p><b>Advance Preparation for Lessons 21–25</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>1 Week Before:</b> Begin to collect the six kinds of paper needed for Engineering Challenge demonstrations and activities—printer paper, newspaper, card stock, tissue paper, construction paper, and paper bag paper. The collected paper may be used or new. Avoid glossy paper and dyed paper. (See Lesson 21 Resource D.)</li> <li><input type="checkbox"/> <b>1 Week Before:</b> Begin to collect toilet paper or paper towel tubes (13). (See Lesson 22 Resource C.)</li> </ul>





## Lesson 15

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Tape (partial roll)</p> <p><b>Prepared Items from Previous Lessons</b> <input type="checkbox"/> Plant and animal cards from Lesson 12 (1 set)</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 16 requires the prepared class fire effects chart.</p>
<b>Resources</b>	<input type="checkbox"/> Lesson 15 Resource: Fire Time-Lapse Photographs 
<b>Preparation</b>	<input type="checkbox"/> Cue prescribed fire video ( <a href="http://phdsci.link/1838">http://phdsci.link/1838</a> ). 




## Lesson 16

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Student anchor model components <ul style="list-style-type: none"> <li>○ Background image (12)</li> <li>○ Florida mouse stickers (12)</li> <li>○ Gopher tortoise stickers (12)</li> <li>○ Indigo snake stickers (12)</li> <li>○ Longleaf pine stickers (108)</li> <li>○ Red-cockaded woodpecker stickers (12)</li> <li>○ Sun stickers (12)</li> <li>○ Wiregrass stickers (96)</li> </ul> </li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Markers, dry erase, black (12)</li> <li><input type="checkbox"/> Paper towels (12 sheets)</li> <li><input type="checkbox"/> Scissors (1)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class fire effects chart started in Lesson 15 (1)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 16 Resource A: Forest Environment Photographs </li> <li><input type="checkbox"/> Lesson 16 Resource B: Fire Cycle Diagram </li> <li><input type="checkbox"/> Lesson 16 Resource C: Longleaf Pine Forest Storyboard Drawings </li> <li><input type="checkbox"/> <i>At Home with the Gopher Tortoise: The Story of a Keystone Species</i></li> </ul>
<b>Preparation</b> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare longleaf pine forest storyboard drawings. (See Lesson 16 Resource C.)</li> </ul> <p><b>Advance Preparation for Lessons 19–20</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>1–3 Days Before:</b> Collect and store the trash and recycling generated by the class for 1–3 days. Remove dangerous or unsanitary materials. Fill a bucket or small trash can with a variety of the collected trash and recyclable materials (e.g., paper, plastic, metal items).</li> </ul>

## Lesson 17

<b>Materials</b>	<b>Kit Items</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class anchor model components             <ul style="list-style-type: none"> <li><input type="radio"/> Burrow sticker (1)</li> <li><input type="radio"/> Fire sticker (1)</li> <li><input type="radio"/> Florida mouse sticker (1)</li> <li><input type="radio"/> Gopher tortoise sticker (1)</li> <li><input type="radio"/> Indigo snake sticker (1)</li> <li><input type="radio"/> Wiregrass stickers (5)</li> </ul> </li> </ul> <b>Module 1 Kit</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sentence strip (1)</li> </ul> <b>School-Supplied Items</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Paper towel (1 sheet)</li> <li><input type="checkbox"/> Pencils, brown, green, orange (24 sets)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 14 Resource A: Longleaf Pine Forest Maps </li> <li><input type="checkbox"/> Lesson 17 Resource: Planting Longleaf Pines Photographs </li> </ul>
<b>Preparation</b>	None



## Lesson 18

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> None
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 18 Resource A: Different Kinds of Gardens Photographs </li> <li><input type="checkbox"/> Lesson 18 Resource B: Conceptual Checkpoint </li> <li><input type="checkbox"/> Lesson 18 Resource C: City Yard Photographs with Student Comments </li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare to distribute a color copy of Lesson 18 Resource B to each student.</li> </ul>



## Lesson 19

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bucket, plastic, 10 qt (1) or trash can, small (1)</li> <li><input type="checkbox"/> Knowledge Deck posters             <ul style="list-style-type: none"> <li>○ Disappearing Longleaf Pine Forests (1)</li> <li>○ The Problem with Trash (1)</li> </ul> </li> <li><input type="checkbox"/> Tarp (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Collected trash and recycling</li> <li><input type="checkbox"/> Gloves, disposable (1 pair for teacher)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 20 requires the bucket or small trash can containing trash and recycling and the tarp.</li> <li><input type="checkbox"/> Lesson 21 requires The Problem with Trash Knowledge Deck poster.</li> </ul>
<b>Resources</b>	None
<b>Preparation</b>	None




## Lesson 20

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Knowledge Deck cards, The Problem with Trash (24)</li> <li><input type="checkbox"/> Tarp (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Gloves, disposable (1 pair for teacher)</li> <li><input type="checkbox"/> Recycling bin or cardboard box (1)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bucket or small trash can containing trash and recycling from Lesson 19.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 20 Resource A: Optional Instructions for Making a Primary Balance</li> <li><input type="checkbox"/> Lesson 20 Resource B: Objects Made from Recycled Materials Photographs </li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue recycling video (<a href="http://phdsci.link/1887">http://phdsci.link/1887</a>). </li> </ul>


## Lesson 21

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Knowledge Deck poster, The Problem with Trash (1)</li> <li><input type="checkbox"/> Sunflower seed packet (1 seed)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ruler (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Magnet (1, optional)</li> <li><input type="checkbox"/> Paper gathered for Engineering Challenge, enough 8.5" × 11" sheets to provide the three sizes needed (8.5" × 11"; 8.5" × 5.5"; and 4" × 11") and scraps             <ul style="list-style-type: none"> <li><input type="radio"/> Card stock (56 sheets)</li> <li><input type="radio"/> Construction paper (56 sheets)</li> <li><input type="radio"/> Newspaper (57 sheets)</li> <li><input type="radio"/> Paper bag paper (56 sheets)</li> <li><input type="radio"/> Printer paper (83 sheets)</li> <li><input type="radio"/> Tissue paper (56 sheets)</li> </ul> </li> <li><input type="checkbox"/> Paper for Lesson 21             <ul style="list-style-type: none"> <li><input type="radio"/> Printer paper, 8.5" × 11" (25 sheets)</li> </ul> </li> <li><input type="checkbox"/> Seed-starting potting mix with sphagnum peat moss (<math>\frac{1}{2}</math> cup)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Water (3 oz)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 22 requires the prepared class problem and solution chart.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 21 Resource A: Engineering Challenge Rubric</li> <li><input type="checkbox"/> Lesson 21 Resource B: Sunflower Storyboard </li> <li><input type="checkbox"/> Lesson 21 Resource C: Engineering Design Process Visual </li> <li><input type="checkbox"/> Lesson 21 Resource D: Paper Preparation Instructions</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare paper. (See Lesson 21 Resource D.)</li> </ul>


## Lesson 22

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pan, foil, 13" × 9" × 2" (1)</li> <li><input type="checkbox"/> Spray bottle, 8 oz (1)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ruler (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Glue or tape</li> <li><input type="checkbox"/> Magnet (1, optional)</li> <li><input type="checkbox"/> Metal can, unopened, 6 oz (1)</li> <li><input type="checkbox"/> Paper             <ul style="list-style-type: none"> <li><input type="checkbox"/> Card stock, 8.5" × 11" (12 sheets plus scraps)</li> <li><input type="checkbox"/> Construction paper, 8.5" × 11" (12 sheets plus scraps)</li> <li><input type="checkbox"/> Newspaper, 8.5" × 11" (12 sheets plus scraps)</li> <li><input type="checkbox"/> Newspaper, 4" × 11" (1 sheet)</li> <li><input type="checkbox"/> Paper bag paper, 8.5" × 11" (12 sheets plus scraps)</li> <li><input type="checkbox"/> Printer paper, 8.5" × 11" (13 sheets plus scraps)</li> <li><input type="checkbox"/> Tissue paper, 8.5" × 11" (12 sheets plus scraps)</li> </ul> </li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Toilet paper tubes (13)</li> <li><input type="checkbox"/> Water (8 oz)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class problem and solution chart started in Lesson 21 (1)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 23 requires the foil pan, spray bottle, and prepared Yes and No sorting cards.</li> <li><input type="checkbox"/> Lesson 24 requires the metal can and prepared class problem and solution chart.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 21 Resource A: Engineering Challenge Rubric</li> <li><input type="checkbox"/> Lesson 21 Resource C: Engineering Design Process Visual </li> <li><input type="checkbox"/> Lesson 22 Resource A: Flower Pot Photographs </li> <li><input type="checkbox"/> Lesson 22 Resource B: Flower Pot Creation Classroom Procedure</li> <li><input type="checkbox"/> Lesson 22 Resource C: Paper Testing Classroom Procedures</li> <li><input type="checkbox"/> Lesson 22 Resource D: Yes and No Sorting Cards</li> <li><input type="checkbox"/> Lesson 22 Resource E: New Engineering Design Process Visual </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare paper. (See Lesson 21 Resource D.)</li> <li><input type="checkbox"/> Prepare Yes and No sorting cards. (See Lesson 22 Resource D.)</li> </ul>



## Lesson 23

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pans, foil, 13" × 9" × 2" (13)</li> <li><input type="checkbox"/> Spray bottles, 8 oz (5)</li> <li><input type="checkbox"/> Weights of 25 g (13)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ruler (1)</li> <li><input type="checkbox"/> Spray bottles, 8 oz (7)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Glue sticks (24)</li> <li><input type="checkbox"/> Magnet (1, optional)</li> <li><input type="checkbox"/> Paper <ul style="list-style-type: none"> <li><input type="radio"/> Card stock, 8.5" × 5.5" (12 sheets plus scraps)</li> <li><input type="radio"/> Construction paper, 8.5" × 5.5" (12 sheets plus scraps)</li> <li><input type="radio"/> Newspaper, 8.5" × 5.5" (12 sheets plus scraps)</li> <li><input type="radio"/> Paper bag paper, 8.5" × 5.5" (12 sheets plus scraps)</li> <li><input type="radio"/> Printer paper, 8.5" × 5.5" (13 sheets plus scraps)</li> <li><input type="radio"/> Tissue paper, 8.5" × 5.5" (12 sheets plus scraps)</li> </ul> </li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Water (access)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Yes and No sorting cards from Lesson 22 (12 sets)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 24 requires the foil pans and spray bottles.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 21 Resource A: Engineering Challenge Rubric</li> <li><input type="checkbox"/> Lesson 22 Resource C: Paper Testing Classroom Procedures</li> <li><input type="checkbox"/> Lesson 22 Resource E: New Engineering Design Process Visual </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare paper. (See Lesson 21 Resource D.)</li> </ul>

## Lesson 24


<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cups, paper, 12 oz (25)</li> <li><input type="checkbox"/> Pans, foil, 13" × 9" × 2" (13)</li> <li><input type="checkbox"/> Spoons (13)</li> <li><input type="checkbox"/> Spray bottles, 8 oz (5)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ruler (1)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Spray bottles, 8 oz (7)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Magnet (1, optional)</li> <li><input type="checkbox"/> Metal cans, unopened, 6 oz (12)</li> <li><input type="checkbox"/> Paper <ul style="list-style-type: none"> <li><input type="radio"/> Card stock, 4" × 11" (36 sheets)</li> <li><input type="radio"/> Construction paper, 4" × 11" (36 sheets)</li> <li><input type="radio"/> Newspaper, 4" × 11" (37 sheets)</li> <li><input type="radio"/> Paper bag paper, 4" × 11" (36 sheets)</li> <li><input type="radio"/> Printer paper, 4" × 11" (36 sheets)</li> <li><input type="radio"/> Tissue paper, 4" × 11" (36 sheets)</li> </ul> </li> <li><input type="checkbox"/> Seed-starting potting mix with sphagnum peat moss (13 cups)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Water (access)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class problem and solution chart started in Lesson 21 (1)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 25 requires 12 sets of the prepared flower pot creation and testing materials and the prepared class problem and solution chart.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 21 Resource A: Engineering Challenge Rubric</li> <li><input type="checkbox"/> Lesson 22 Resource B: Flower Pot Creation Classroom Procedure</li> <li><input type="checkbox"/> Lesson 22 Resource E: New Engineering Design Process Visual </li> <li><input type="checkbox"/> Lesson 24 Resource: Flower Pot Testing Setup Instructions and Classroom Procedure</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare paper. (See Lesson 21 Resource D.)</li> <li><input type="checkbox"/> Prepare cups of seed-starting potting mix with sphagnum peat moss and cups of water for flower pot testing. (See Lesson 24 Resource.)</li> </ul>

## Lesson 25






<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sunflower seed packet (12 seeds, optional)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ruler (1)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Glue sticks (24)</li> <li><input type="checkbox"/> Magnet (1, optional)</li> <li><input type="checkbox"/> Paper             <ul style="list-style-type: none"> <li><input type="checkbox"/> Card stock, 4" × 11" (36 sheets plus scraps)</li> <li><input type="checkbox"/> Construction paper, 4" × 11" (36 sheets plus scraps)</li> <li><input type="checkbox"/> Newspaper, 4" × 11" (36 sheets plus scraps)</li> <li><input type="checkbox"/> Paper bag paper, 4" × 11" (36 sheets plus scraps)</li> <li><input type="checkbox"/> Printer paper, 4" × 11" (36 sheets plus scraps)</li> <li><input type="checkbox"/> Tissue paper, 4" × 11" (36 sheets plus scraps)</li> </ul> </li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Seed-starting potting mix with sphagnum peat moss (12 cups)</li> <li><input type="checkbox"/> Water (access)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Class problem and solution chart started in Lesson 21 (1)</li> <li><input type="checkbox"/> Flower pot creation and testing materials from Lesson 24 (12 sets)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 21 Resource A: Engineering Challenge Rubric</li> <li><input type="checkbox"/> Lesson 21 Resource B: Sunflower Storyboard </li> <li><input type="checkbox"/> Lesson 22 Resource E: New Engineering Design Process Visual </li> <li><input type="checkbox"/> Lesson 24 Resource: Flower Pot Testing Setup Instructions and Classroom Procedure</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare paper. (See Lesson 21 Resource D.)</li> <li><input type="checkbox"/> Prepare cups of seed-starting potting mix with sphagnum peat moss and cups of water for flower pot testing. (See Lesson 24 Resource.)</li> </ul>





## Lesson 26

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Scissors (1)</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 1 Resource A: Gopher Tortoise Photograph </p> <p><input type="checkbox"/> Lesson 26 Resource: Key Term Cards</p>
<b>Preparation</b>	<p><input type="checkbox"/> Prepare key term cards. (See Lesson 26 Resource.)</p>

## Lesson 27

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> None</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 27 Resource A: Joshua Tree National Park Sign Photograph </p> <p><input type="checkbox"/> Lesson 27 Resource B: Greater Roadrunner and Costa's Hummingbird Photographs </p> <p><input type="checkbox"/> Lesson 27 Resource C: Scientists Observing Water Photograph </p> <p><input type="checkbox"/> Student End-of-Module Assessment </p>
<b>Preparation</b>	<p><input type="checkbox"/> Cue Hidden Valley Trail video (<a href="http://phdsci.link/1875">http://phdsci.link/1875</a>). </p> <p><input type="checkbox"/> Prepare to distribute a copy of the End-of-Module Assessment to each student.</p>

## Lesson 28

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Scissors (1)</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 28 Resource: Recurring Themes and Concepts Cards </p> <p><input type="checkbox"/> End-of-Module Assessment Sample Responses</p> <p><input type="checkbox"/> End-of-Module Assessment Rubric</p>
<b>Preparation</b>	<p><input type="checkbox"/> Cue Hidden Valley Trail video (<a href="http://phdsci.link/1875">http://phdsci.link/1875</a>). </p> <p><input type="checkbox"/> Score End-of-Module Assessment and write individual feedback.</p> <p><input type="checkbox"/> Select at least one End-of-Module Assessment item for the class to debrief, and prepare a sample response for that item to share with students.</p> <p><input type="checkbox"/> Prepare Recurring Themes and Concepts cards. (See Lesson 28 Resource.)</p>



## Water | Advance Preparation

An activity in these lessons requires advance preparation. A version of this list appears in the Spotlight Overview of the Teacher Edition. The expanded version in this guide identifies all lessons for which preparation may take longer than a planning period. A symbol (†) identifies preparation that can be done earlier than the suggested time.




Lesson	Time in Advance	Investigation	Description
3	3–4 Days	Compare Fresh Water and Salt Water	Prepare water samples and dry samples for comparing fresh water and salt water.
4	1 day†	Water Color and Clarity Investigation	Prepare water color and clarity samples.

## Water | Lesson Preparation





### Lesson 1

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>Module 1 Kit</b> <input type="checkbox"/> Sentence strips (3)</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Glue or tape <input type="checkbox"/> Pocket chart (1) <input type="checkbox"/> Scissors (1)</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 3 requires the water use class chart.</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 1 Resource A: Photographs of Living Things Interacting with Water </p> <p><input type="checkbox"/> Lesson 1 Resource B: Water Use Cards</p> <p><input type="checkbox"/> <i>Water Rolls, Water Rises (El agua rueda, el agua sube)</i> (Mora and So 2020)</p>
<b>Preparation</b> 	<p><input type="checkbox"/> Prepare water use cards. (See Lesson 1 Resource B.)</p> <p><b>Advance Preparation for Lesson 3</b> <input type="checkbox"/> Prepare water samples and dry samples for fresh water and salt water comparison 3 or 4 days before Lesson 3. (See Lesson 3 Resource C.)</p>




## Lesson 2

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clay, modeling, nonhardening, blue (3 lb)</li> <li><input type="checkbox"/> Sheet protectors, clear, 8.5" × 11" (24)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Construction paper, brown, 9" × 12" (24 sheets)</li> <li><input type="checkbox"/> Glue or tape</li> <li><input type="checkbox"/> Scissors (1)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 2 Resource A: World Map </li> <li><input type="checkbox"/> Lesson 2 Resource B: Instructions for Using the Texas Watershed Viewer</li> <li><input type="checkbox"/> Lesson 2 Resource C: Texas Water Bodies Cards</li> <li><input type="checkbox"/> Lesson 2 Resource D: Map of Texas with Photographs </li> <li><input type="checkbox"/> Lesson 2 Resource E: Texas Water Bodies Cards Key (Optional)</li> <li><input type="checkbox"/> Lesson 2 Resource F: Water Body Model Procedure Sheets</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue Texas Watershed Viewer on ArcGIS (<a href="http://phdsci.link/2461">http://phdsci.link/2461</a>). (See Lesson 2 Resource B.) </li> <li><input type="checkbox"/> Prepare Texas water bodies cards. (See Lesson 2 Resource C.)</li> <li><input type="checkbox"/> Prepare water body model procedure sheets. (See Lesson 2 Resource F.)</li> </ul>





## Lesson 3

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Containers, clear plastic, round, 8 oz (12)</li> <li><input type="checkbox"/> Graduated cylinder, 100 mL (1)</li> <li><input type="checkbox"/> Jars with lids, clear plastic, 4 oz (12)</li> <li><input type="checkbox"/> Magnifiers, handheld, plastic (6)</li> <li><input type="checkbox"/> Measuring cup, 1 L (1)</li> <li><input type="checkbox"/> Spoon (1)</li> <li><input type="checkbox"/> Table salt (1 cup)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Marker, permanent (1)</li> <li><input type="checkbox"/> Plastic wrap, enough to cover the 1 L measuring cup (1 piece)</li> <li><input type="checkbox"/> Tape, masking (partial roll)</li> <li><input type="checkbox"/> Water (access)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Water use class chart started in Lesson 1</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 4 requires the 1 L measuring cup.</li> <li><input type="checkbox"/> Lesson 6 requires the water use class chart.</li> <li><input type="checkbox"/> Lesson 8 requires the 100 mL graduated cylinder.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 2 Resource B: Instructions for Using the Texas Watershed Viewer</li> <li><input type="checkbox"/> Lesson 2 Resource D: Map of Texas with Photographs </li> <li><input type="checkbox"/> Lesson 3 Resource A: Birds Drinking from a Puddle Photograph </li> <li><input type="checkbox"/> Lesson 3 Resource B: Gulf of Mexico and Lake Houston Photographs </li> <li><input type="checkbox"/> Lesson 3 Resource C: Water and Evaporation Samples Setup Instructions</li> <li><input type="checkbox"/> Lesson 3 Resource D: Texas Water Bodies Posters</li> <li><input type="checkbox"/> <i>Water Rolls, Water Rises (El agua rueda, el agua sube)</i></li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue Texas Watershed Viewer on ArcGIS (<a href="http://phdsci.link/2461">http://phdsci.link/2461</a>). (See Lesson 2 Resource B.) </li> <li><input type="checkbox"/> Identify six areas of the classroom to use for a Question Corners routine. Prepare a copy of each Texas water body poster. Before the lesson, place one poster in each area. (See Lesson 3 Resource D.)</li> </ul>









## Lesson 4

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Food coloring (10 drops)</li> <li><input type="checkbox"/> Hot chocolate powder (5 tbsp)</li> <li><input type="checkbox"/> Measuring cup, 1 L (1)</li> <li><input type="checkbox"/> Spoons (2)</li> <li><input type="checkbox"/> Test tubes with caps, clear plastic, 40 mL (36)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Sentence strips (4)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Tape, masking (partial roll)</li> <li><input type="checkbox"/> Water (access)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 2 Resource D: Map of Texas with Photographs </li> <li><input type="checkbox"/> Lesson 4 Resource A: Water Scientist Photograph </li> <li><input type="checkbox"/> Lesson 4 Resource B: Water Color and Clarity Samples Setup Instructions</li> <li><input type="checkbox"/> Lesson 4 Resource C: Underwater Swimmer Photograph </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare water color and clarity samples. (See Lesson 4 Resource B.)</li> </ul>


## Lesson 5

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bin, clear plastic, 16 qt (1)</li> <li><input type="checkbox"/> Cups, clear plastic, 3.5 oz (12)</li> <li><input type="checkbox"/> Gravel (2 cups)</li> <li><input type="checkbox"/> Knife, putty (1)</li> <li><input type="checkbox"/> Sand, fine (2 cups)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cup, 16 oz (1)</li> <li><input type="checkbox"/> Topsoil (2 cups)</li> <li><input type="checkbox"/> Water (access)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 5 Resource A: Lake Houston in 2016 and 2017 Photographs </li> <li><input type="checkbox"/> Lesson 5 Resource B: River, Stream, and Lake Houston Photograph </li> <li><input type="checkbox"/> Lesson 5 Resource C: Labeled River, Stream, and Lake Houston Photographs </li> <li><input type="checkbox"/> Lesson 5 Resource D: Lake Houston Model Setup Instructions</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue river flowing into a lake video (<a href="http://phdsci.link/2451">http://phdsci.link/2451</a>). </li> <li><input type="checkbox"/> Prepare Lake Houston model. (See Lesson 5 Resource D.)</li> </ul>





## Lesson 6

<p><b>Materials</b></p>	<p><b>Kit Items</b> None</p> <p><b>Module 1 Kit</b> <input type="checkbox"/> Sentence strips (2)</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Paper, small piece (1) <input type="checkbox"/> Pencils, colored, blue (24) <input type="checkbox"/> Water (access) <input type="checkbox"/> Watering can (1)</p> <p><b>Prepared Items from Previous Lessons</b> <input type="checkbox"/> Water use class chart started in Lesson 1</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 8 requires the water use class chart.</p>
<p><b>Resources</b></p>	<p><input type="checkbox"/> Lesson 6 Resource A: Trash in Lake Houston Photograph </p> <p><input type="checkbox"/> Lesson 6 Resource B: Trash on Sidewalk Photograph </p> <p><input type="checkbox"/> Lesson 6 Resource C: Illustration of Storm Drain in Schoolyard </p>
<p><b>Preparation</b></p>	<p><input type="checkbox"/> Prepare for rainwater demonstration. Identify a paved, outdoor area in or near the schoolyard, such as a sidewalk, where students can safely observe the demonstration. Fill a watering can or another container with water. Tear a small piece from a sheet of paper.</p> <p><input type="checkbox"/> Cue</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> rainwater on a sidewalk video (<a href="http://phdsci.link/2452">http://phdsci.link/2452</a>), </li> <li><input type="checkbox"/> storm drain inlet video 1 (<a href="http://phdsci.link/2453">http://phdsci.link/2453</a>), </li> <li><input type="checkbox"/> storm drain inlet video 2 (<a href="http://phdsci.link/2454">http://phdsci.link/2454</a>), </li> <li><input type="checkbox"/> storm drain inlet video 3 (<a href="http://phdsci.link/2455">http://phdsci.link/2455</a>),  and</li> <li><input type="checkbox"/> raindrop path simulation (<a href="http://phdsci.link/2456">http://phdsci.link/2456</a>). </li> </ul>


## Lesson 7

<p><b>Materials</b></p>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Glue stick (1) <input type="checkbox"/> Scissors (1) <input type="checkbox"/> Tape (partial roll)</p>
<p><b>Resources</b></p>	<p><input type="checkbox"/> Lesson 7 Resource A: Trash in a Water Body Illustration </p> <p><input type="checkbox"/> Lesson 7 Resource B: Protect Water Bodies Poster Setup Instructions</p>
<p><b>Preparation</b></p>	<p><input type="checkbox"/> Prepare protect water bodies posters. (See Lesson 7 Resource B.)</p> <p><input type="checkbox"/> Identify areas in and around the school building (e.g., playground, sidewalk, cafeteria, classroom) where students can look for solutions that help prevent trash from entering water bodies.</p>






## Lesson 8

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Food coloring, blue (10 drops)</li> <li><input type="checkbox"/> Graduated cylinders, 100 mL (2)</li> <li><input type="checkbox"/> Pipette, disposable, 3 mL (1)</li> </ul> <p><b>Module 1 Kit</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Sentence strips (3)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Glue sticks (24)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Tape, masking (partial roll)</li> <li><input type="checkbox"/> Water (access)</li> <li><input type="checkbox"/> Water jug, 1 gal (1)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Water use class chart started in Lesson 1</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 2 Resource A: World Map</li> <li><input type="checkbox"/> Lesson 8 Resource A: Relative Volume of Fresh Water and Salt Water Demonstration Setup Instructions</li> <li><input type="checkbox"/> Lesson 8 Resource B: Water Jug Tower Image </li> <li><input type="checkbox"/> Lesson 8 Resource C: Water Use Comparison Cards</li> <li><input type="checkbox"/> Lesson 8 Resource D: Gallon Symbols</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare for relative volume of fresh water and salt water demonstration. (See Lesson 8 Resource A.)</li> <li><input type="checkbox"/> Cue dripping faucet video (<a href="http://phdsci.link/2458">http://phdsci.link/2458</a>). </li> <li><input type="checkbox"/> Cue handwashing video 1 (<a href="http://phdsci.link/2470">http://phdsci.link/2470</a>)  and handwashing video 2 (<a href="http://phdsci.link/2471">http://phdsci.link/2471</a>). </li> <li><input type="checkbox"/> Prepare water use comparison cards. (See Lesson 8 Resource C.)</li> <li><input type="checkbox"/> Prepare gallon symbols. (See Lesson 8 Resource D.)</li> </ul>


## Lesson 9

<b>Materials</b>	<p><b>Kit Items</b></p> <p>None</p> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Scissors (1)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 9 Resource A: Term Cards</li> <li><input type="checkbox"/> Lesson 9 Resource B: Exploration Green Photographs </li> <li><input type="checkbox"/> Student End-of-Spotlight Assessment Part A</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare term cards. (See Lesson 9 Resource A.)</li> <li><input type="checkbox"/> Prepare to distribute a copy of the End-of-Spotlight Assessment Part A to each student.</li> </ul>

## Lesson 10

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> None
<b>Resources</b>	<input type="checkbox"/> Lesson 9 Resource B: Exploration Green Photographs  <input type="checkbox"/> Lesson 10 Resource A: Retention Pond Before and After Heavy Rain Models  <input type="checkbox"/> Lesson 10 Resource B: Water Sample Photographs  <input type="checkbox"/> Lesson 10 Resource C: Storm Drain System and Retention Pond System Models  <input type="checkbox"/> Lesson 10 Resource D: Lake Houston in 2010 and 2011 Photographs  <input type="checkbox"/> Student End-of-Spotlight Assessment Parts B and C
<b>Preparation</b>	<input type="checkbox"/> Prepare to distribute copies of the End-of-Spotlight Assessment Parts B and C to each student.

## Lesson 11

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> <input type="checkbox"/> Scissors (1)
<b>Resources</b>	<input type="checkbox"/> Lesson 9 Resource B: Exploration Green Photographs  <input type="checkbox"/> Lesson 11 Resource: Recurring Themes and Concepts Card <input type="checkbox"/> End-of-Spotlight Assessment Sample Responses <input type="checkbox"/> End-of-Spotlight Assessment Rubric
<b>Preparation</b>	<input type="checkbox"/> Score End-of-Spotlight Assessment and write individual feedback. <input type="checkbox"/> Select at least one End-of-Spotlight Assessment item for the class debrief, and prepare a sample response for that item to provide to students. <input type="checkbox"/> Prepare Recurring Themes and Concepts card. (See Lesson 11 Resource.)



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## Environments | Works Cited

Dunphy, Madeleine, and Michael Rothman (illustrator). 2010. *At Home with the Gopher Tortoise: The Story of a Keystone Species*. Berkeley, CA: Web of Life Children's Books. [All references to *At Home with the Gopher Tortoise* are from this source.]

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## Water | Works Cited

Mora, Pat, and Meilo So. 2020. *Water Rolls, Water Rises (El agua rueda, el agua sube)*. Translated by Adriana Domínguez and Pat Mora. New York: Children's Book Press.