



# Preparation Guide

## Level 4 Module 1

### EARTH FEATURES

#### with Spotlight Lessons on Mixtures and Solutions

**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.





## Earth Features | Advance Preparation

Several activities in this module require advance preparation. 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
7	7 days	Plant Station	Prepare plaster of Paris and plant seeds for investigation.
7	2 days	Ice Station	Prepare plaster of Paris and balloons for investigation.
7	1 day	Plant Station	Prepare control for Plant Station.
9	1 day†	Stream Table Setup	Prepare Stream Tables for investigation.
10	1 day†	Cups with Holes Setup	Prepare cups with holes for investigation.
19	1 day†	Colorado River Model	Prepare Colorado River Model stream tables for investigation.
23	1 day†	Land and Water Interactions Investigation Setup Instructions	Prepare materials for land and water interactions investigation.

## Earth Features | Lesson Preparation

### Lesson 1

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> None
<b>Resources</b>	<input type="checkbox"/> Lesson 1 Resource A: John Wesley Powell Information  <input type="checkbox"/> Lesson 1 Resource B: Powell's 1871 Expedition Team Photographs  <input type="checkbox"/> Lesson 1 Resource C: Grand Canyon Painting  <input type="checkbox"/> Lesson 1 Resource D: Present-Day Grand Canyon Photographs 
<b>Preparation</b>	None  <b>Advance Preparation for Lesson 7</b> <input type="checkbox"/> <b>1 Week Before:</b> Start preparation for Plant Station. (See Lesson 7 Resource A.) While planting six to seven days in advance is ideal, the plant station can still be effective in as little as four days.

## Lesson 2

No materials, resources, or preparation required.






Requires advance preparation





in digital slides




## Lesson 3

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clay, modeling, 4 oz of each color (5 colors)</li> <li><input type="checkbox"/> Bags, resealable plastic, 1 qt (5)</li> <li><input type="checkbox"/> Sheet protectors, heavy-duty (12)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Craft sticks or toothpicks (30, optional)</li> <li><input type="checkbox"/> Markers, dry erase, 6 colors (12 of each color)</li> <li><input type="checkbox"/> Objects, small (e.g., cones, ferns, shells, sticks) (5 sets)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 4 requires 1 resealable plastic bag, the annotated rock layer photograph, and the clay rock layers created by students.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 1 Resource D: Present-Day Grand Canyon Photographs–Figure 4 </li> <li><input type="checkbox"/> Lesson 3 Resource A: Grand Canyon Fossil Guide </li> <li><input type="checkbox"/> Lesson 3 Resource B: Grand Canyon Layers–Additional Information for Teachers (optional)</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue “Over the Rim, Into the Canyon” (NPS 2009) video (<a href="http://phdsci.link/1000">http://phdsci.link/1000</a>). </li> <li><input type="checkbox"/> Prepare to distribute a copy of Figure 4 from Present-Day Grand Canyon Photographs (Lesson 1 Resource D) in a heavy-duty sheet protector to each student.</li> <li><input type="checkbox"/> Prepare one section of Grand Canyon Fossil Guide for each group. (See Lesson 3 Resource A.)</li> </ul>





## Lesson 4

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clay, modeling, 4 oz (1 color)</li> <li><input type="checkbox"/> Bag, resealable plastic, 1 qt (1)</li> </ul> <p><b>School-Supplied Items</b></p> <p>None</p> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Annotated rock layer photograph from Lesson 3</li> <li><input type="checkbox"/> Clay rock layers from Lesson 3 (5)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 7 requires the prepared clay model of rock layers.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 1 Resource D: Present-Day Grand Canyon Photographs: Figure 4 </li> <li><input type="checkbox"/> Lesson 4 Resource: Layered Cake Photograph </li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Roll out nonhardening modeling clay to create Rock Layer F.</li> </ul>


## Lesson 5

<p><b>Materials</b></p>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> None</p>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 5 Resource: Palo Duro Canyon Photographs </li> <li><input type="checkbox"/> <i>Grand Canyon</i> (Chin 2017)</li> </ul>
<p><b>Preparation</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue Palo Duro Canyon video (<a href="http://phdsci.link/2380">http://phdsci.link/2380</a>). </li> </ul> <p><b>Advance Preparation for Lesson 7</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>2 Days Before:</b> Prepare plaster of Paris and balloons for investigation. (See Lesson 7 Resource A.)</li> </ul>




## Lesson 6

<p><b>Materials</b></p>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Scissors (1)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 6 Resource A: Animal Track Photograph </li> <li><input type="checkbox"/> Lesson 6 Resource B: Texas Fossil Cards</li> <li><input type="checkbox"/> Lesson 6 Resource C: Map of Texas Fossil Locations</li> <li><input type="checkbox"/> Lesson 6 Resource D: Conceptual Checkpoint Model </li> <li><input type="checkbox"/> Lesson 6 Resource E: Conceptual Checkpoint </li> </ul>
<p><b>Preparation</b></p> 	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare Texas fossil cards and map of Texas fossil locations for each group. (See Lesson 6 Resources B and C.)</li> <li><input type="checkbox"/> Access Google Earth™ mapping service (<a href="http://phdsci.link/1310">http://phdsci.link/1310</a>), and use the Search bar to zoom in on Kettleman Hills, California.</li> <li><input type="checkbox"/> Prepare to distribute a copy of Lesson 6 Resource E to each student.</li> </ul> <p><b>Advance Preparation for Lesson 7</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>1 Day Before:</b> Prepare control for plant station. (See Lesson 7 Resource A.)</li> </ul>



## Lesson 7

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Balloon pump, handheld (1)</li> <li><input type="checkbox"/> Balloons, small (8)</li> <li><input type="checkbox"/> Cups, clear plastic, 9 oz (14)</li> <li><input type="checkbox"/> Knife, plastic (1)</li> <li><input type="checkbox"/> Lima bean seeds (18)</li> <li><input type="checkbox"/> Magnifier, handheld, plastic (1)</li> <li><input type="checkbox"/> Pipettes, disposable (2)</li> <li><input type="checkbox"/> Plaster of Paris (4 lb)</li> <li><input type="checkbox"/> Plates, paper (9)</li> <li><input type="checkbox"/> Rock, small (1)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Shaving foam (1 can)</li> <li><input type="checkbox"/> Sugar cubes (18)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Paper towels (2 sheets)</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"/> Clay model of rock layers from Lesson 4</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 10 requires the balloon pump.</li> <li><input type="checkbox"/> Lesson 20 requires the modeling clay from the prepared clay model of rock layers.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 1 Resource D: Present-Day Grand Canyon Photographs: Figure 3 </li> <li><input type="checkbox"/> Lesson 7 Resource A: Material Interaction Stations Setup Instructions</li> <li><input type="checkbox"/> Lesson 7 Resource B: Material Interaction Stations Procedure Sheets</li> <li><input type="checkbox"/> <i>Grand Canyon</i></li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Set up materials interaction stations, complete with their respective procedure sheets. (See Lesson 7 Resources A and B.)</li> </ul>


## Lesson 8

<p><b>Materials</b></p>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> None</p>
<p><b>Resources</b></p>	<p><input type="checkbox"/> Lesson 1 Resource D: Present-Day Grand Canyon Photographs: Figure 3 </p> <p><input type="checkbox"/> Lesson 8 Resource: Rocks with Holes Photograph </p>
<p><b>Preparation</b></p> 	<p><b>Advance Preparation for Lesson 9</b></p> <p><input type="checkbox"/> <b>1 Day Before:</b> Prepare stream tables. (See Lesson 9 Resource.)</p>

## Lesson 9

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bins, clear plastic, 20" × 12" × 6" (6)</li> <li><input type="checkbox"/> Cups, clear plastic, 9 oz (6)</li> <li><input type="checkbox"/> Gloves, disposable (24 pairs)</li> <li><input type="checkbox"/> Hook and loop fastener (hook side) (12")</li> <li><input type="checkbox"/> Rubber stoppers (6)</li> <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"/> Drill with <math>\frac{1}{4}</math>" drill bit (1)</li> <li><input type="checkbox"/> Natural materials (e.g., leaves, grass, pebbles, sticks) (about 1 gallon, optional)</li> <li><input type="checkbox"/> Sand (12 cups)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Soil (48 cups)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 10 requires the ruler, drill with drill bit, and prepared stream tables.</li> </ul>
<p><b>Resources</b></p>	<p><input type="checkbox"/> Lesson 1 Resource D: Present-Day Grand Canyon Photographs–Figure 3 </p> <p><input type="checkbox"/> Lesson 9 Resource: Stream Table Setup Instructions</p>
<p><b>Preparation</b></p> 	<p><input type="checkbox"/> Prepare stream tables. (See Lesson 9 Resource.)</p> <p><b>Advance Preparation for Lesson 10</b></p> <p><input type="checkbox"/> <b>1 Day Before:</b> Prepare control for plant station. (See Lesson 10 Resource A.)</p>





## Lesson 10

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Balloon pumps, handheld (6)</li> <li><input type="checkbox"/> Bins, clear plastic, 6 qt (6)</li> <li><input type="checkbox"/> Bowls, large (6)</li> <li><input type="checkbox"/> Cups, clear plastic, 9 oz (24)</li> <li><input type="checkbox"/> Gloves, disposable (24 pairs)</li> <li><input type="checkbox"/> Hook and loop fastener (loop side) (48")</li> <li><input type="checkbox"/> Pebbles (12 cups)</li> <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"/> Drill with <math>\frac{1}{4}</math>" drill bit or Phillips screwdriver (1)</li> <li><input type="checkbox"/> Grass, 1 qt bags (6)</li> <li><input type="checkbox"/> Ice cubes (6)</li> <li><input type="checkbox"/> Natural materials (e.g., leaves, grass, pebbles, sticks) (about 1 gallon, optional)</li> <li><input type="checkbox"/> Pencil, sharp (1)</li> <li><input type="checkbox"/> Rocks, large (12 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"/> Stream tables from Lesson 9 (6)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 11 requires the balloon pumps, bowls, prepared cups with one, two, and three holes, and prepared stream tables. Remove as much of the student investigation materials as possible from the stream tables while leaving the soil mixture.</li> <li><input type="checkbox"/> Lesson 23 requires the ruler.</li> <li><input type="checkbox"/> Lesson 24 requires the pencil.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 10 Resource A: Cups with Holes Setup Instructions</li> <li><input type="checkbox"/> Lesson 10 Resource B: Gravity Investigation Photographs </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare cups with holes. (See Lesson 10 Resource A.)</li> <li><input type="checkbox"/> Prepare to distribute a copy of Lesson 10 Resource B to each group.</li> </ul>



## Lesson 11

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Balloon pumps, handheld (6)</li> <li><input type="checkbox"/> Bowls, large (6)</li> <li><input type="checkbox"/> Gloves, disposable (24 pairs)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Natural materials (e.g., leaves, grass, pebbles, sticks) (about 1 gallon, optional)</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"/> Stream tables with soil mixture from Lesson 9 (6)</li> <li><input type="checkbox"/> Cups with one, two, and three holes from Lesson 10 (6 sets)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 15 requires the bowls, prepared cups with one, two, and three holes, and the prepared stream tables. Remove as much of the student investigation materials as possible from the stream tables while leaving the soil mixture.</li> </ul>
<b>Resources</b>	None
<b>Preparation</b>	None

## Lesson 12

<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 12 Resource A: Colorado River Map and Photographs </li> <li><input type="checkbox"/> Lesson 12 Resource B: Map of Prehistoric North American Glaciers </li> <li><input type="checkbox"/> Lesson 12 Resource C: Conceptual Checkpoint </li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue the animated glacier video (<a href="http://phdsci.link/2381">http://phdsci.link/2381</a>). </li> <li><input type="checkbox"/> Prepare to distribute a copy of Lesson 12 Resource C to each student.</li> </ul>

## Lesson 13

<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"/> <i>Who Were the Wright Brothers?</i> (Buckley 2014)</li> <li><input type="checkbox"/> Lesson 13 Resource A: Engineering Design Process (optional) </li> <li><input type="checkbox"/> Lesson 13 Resource B: Blank Engineering Design Process Chart (optional)</li> <li><input type="checkbox"/> Lesson 13 Resource C: Engineering Challenge Scenario </li> </ul>
<b>Preparation</b>	None



## Lesson 14

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> None</p>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 13 Resource A: Engineering Design Process (optional)</li> <li><input type="checkbox"/> Lesson 13 Resource C: Engineering Challenge Scenario</li> <li><input type="checkbox"/> Lesson 14 Resource: Engineering Challenge Rubric</li> </ul>
<b>Preparation</b>	None

## Lesson 15

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bowls, large (6)</li> <li><input type="checkbox"/> Clay, modeling, nonhardening (1 lb)</li> <li><input type="checkbox"/> Craft sticks, jumbo (60)</li> <li><input type="checkbox"/> Cups, plastic, 3 oz (24)</li> <li><input type="checkbox"/> Gloves, disposable (24 pairs)</li> <li><input type="checkbox"/> Houses, plastic, small (6)</li> <li><input type="checkbox"/> Plates, paper (6)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Skewers, wooden (60)</li> <li><input type="checkbox"/> Straws, plastic (60)</li> <li><input type="checkbox"/> String (1 spool)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Natural materials (e.g., leaves, grass, pebbles, sticks) (about 1 gallon, optional)</li> <li><input type="checkbox"/> Scissors (6)</li> <li><input type="checkbox"/> Various materials (e.g., cardboard boxes, paper towel rolls, masking tape, building blocks) (6 sets)</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"/> Cups with one, two, and three holes from Lesson 10 (6 sets)</li> <li><input type="checkbox"/> Stream tables with soil mixture from Lesson 11 (6)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 16 requires the prototypes students created, bowls, prepared cups with one, two, and three holes, and remaining prepared Engineering Challenge materials.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 14 Resource: Engineering Challenge Rubric</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Gather materials for the Engineering Challenge, and place them in a central location in the classroom. Replenish materials as necessary.</li> </ul>

## Lesson 16

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bowls, large (6)</li> <li><input type="checkbox"/> Gloves, disposable (24 pairs)</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"/> Water (access)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cups with one, two, and three holes from Lesson 10 (6 sets)</li> <li><input type="checkbox"/> Prototypes from Lesson 15 (6)</li> <li><input type="checkbox"/> Remaining Engineering Challenge materials from Lesson 15</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 17 requires the prototypes students created, bowls, prepared cups with one, two, and three holes, and remaining Engineering Challenge materials.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 14 Resource: Engineering Challenge Rubric</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Gather materials for the Engineering Challenge, and place them in a central location in the classroom. Replenish materials as necessary.</li> </ul>




## Lesson 17

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bowls, large (6)</li> <li><input type="checkbox"/> Gloves, disposable (24 pairs)</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"/> Water (access)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cups with one, two, and three holes from Lesson 10 (6 sets)</li> <li><input type="checkbox"/> Prototypes from Lesson 16 (6)</li> <li><input type="checkbox"/> Remaining Engineering Challenge materials from Lesson 16</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 18 requires the prototypes students created.</li> <li><input type="checkbox"/> Lesson 19 requires the prepared cups with three holes.</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 14 Resource: Engineering Challenge Rubric</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Gather materials for the Engineering Challenge, and place them in a central location in the classroom. Replenish materials as necessary.</li> </ul>





## Lesson 18

<b>Materials</b>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Paper, half sheets, or sticky notes (24)</p> <p><b>Prepared Items from Previous Lessons</b> <input type="checkbox"/> Prototypes from Lesson 17 (6)</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 19 requires the prepared stream tables and bowls. Disassemble students' prototypes. Remove as much of the Engineering Challenge materials as possible from the stream tables while leaving the soil mixture. <input type="checkbox"/> Lesson 20 requires the modeling clay.</p>
<b>Resources</b>	<input type="checkbox"/> Lesson 14 Resource: Engineering Challenge Rubric
<b>Preparation</b>	None

## Lesson 19

<b>Materials</b>	<p><b>Kit Items</b> <input type="checkbox"/> Bowls, large (6) <input type="checkbox"/> Gloves, disposable (1 pair) <input type="checkbox"/> Rubber stoppers (6)</p> <p><b>School-Supplied Items</b> <input type="checkbox"/> Sand and soil, extra (optional) <input type="checkbox"/> Water (access)</p> <p><b>Prepared Items from Previous Lessons</b> <input type="checkbox"/> Cups with three holes from Lesson 10 (6) <input type="checkbox"/> Stream tables with soil mixture from Lesson 11 (6)</p> <p><b>Item Reuse</b> <input type="checkbox"/> Lesson 20 requires the bowls and prepared river models.</p>
<b>Resources</b>	<p><input type="checkbox"/> Lesson 19 Resource A: Theodore Roosevelt Dam Photograph </p> <p><input type="checkbox"/> Lesson 19 Resource B: Pre-1903 Colorado River System Map </p> <p><input type="checkbox"/> Lesson 19 Resource C: Model the Colorado River Setup Instructions</p> <p><input type="checkbox"/> Lesson 19 Resource D: Model the Colorado River Procedure Sheet</p>
<b>Preparation</b>	<p><input type="checkbox"/> Cue beaver dam video (<a href="http://phdsci.link/1002">http://phdsci.link/1002</a>). </p> <p><input type="checkbox"/> Prepare river models for Colorado River investigation. (See Lesson 19 Resource C.)</p> <p><input type="checkbox"/> Prepare to distribute procedure sheets for Colorado River investigation. (See Lesson 19 Resource D.)</p>


## Lesson 20

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Bowls, large (6)</li> <li><input type="checkbox"/> Clay, modeling, nonhardening (1 <math>\frac{1}{2}</math> lb)</li> <li><input type="checkbox"/> Cutting boards, thin plastic, 15" × 11" (2)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Hole punch, one-hole (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"/> River models from Lesson 19 (6)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 19 Resource B: Pre-1903 Colorado River System Map </li> <li><input type="checkbox"/> Lesson 20 Resource A: Effects of a Dam on a River Investigation Setup Instructions</li> <li><input type="checkbox"/> Lesson 20 Resource B: Dam Gates Photograph </li> <li><input type="checkbox"/> Lesson 20 Resource C: Effects of a Dam on a River Investigation Procedure Sheet</li> <li><input type="checkbox"/> Lesson 20 Resource D: Effects of a Dam on a River Investigation Photographs </li> <li><input type="checkbox"/> Lesson 20 Resource E: Present-Day Colorado River System Map </li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare plastic dams for effects of a dam on a river investigation. (See Lesson 20 Resource A.)</li> <li><input type="checkbox"/> Prepare to distribute procedure sheets for effects of a dam on a river investigation. (See Lesson 20 Resource C.)</li> </ul>





## Lesson 21

<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"/> Index cards (72)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 21 Resource A: Additional Theodore Roosevelt Dam Photographs</li> <li><input type="checkbox"/> Lesson 21 Resource B: Excerpts from “The Hoover Dam: Controlling Water in the West” (Adapted) (Lusted 2016)</li> <li><input type="checkbox"/> Lesson 21 Resource C: “The Hoover Dam: Controlling Water in the West” (Adapted)</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare to distribute a copy of Lesson 21 Resource B to each student.</li> </ul>




## Lesson 22

<p><b>Materials</b></p>	<p><b>Kit Items</b> None</p> <p><b>School-Supplied Items</b> None</p>
<p><b>Resources</b></p>	<p><input type="checkbox"/> Lesson 22 Resource A: Excerpts for Jigsaw Reading</p> <p><input type="checkbox"/> Lesson 22 Resource B: Wave Power Article</p>
<p><b>Preparation</b></p> 	<p><input type="checkbox"/> Obtain texts for Jigsaw reading. (See Lesson 22 Resource A.)</p> <p><input type="checkbox"/> Prepare to distribute copies of Lesson 22 Resource B for Jigsaw reading.</p> <p><b>Advance Preparation for Lesson 23</b></p> <p><input type="checkbox"/> <b>1 Day Before:</b> Prepare materials for land and water interactions investigation. (See Lesson 23 Resource A.)</p>







## Lesson 23

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clay, powdered (2 cups)</li> <li><input type="checkbox"/> Coffee filters (18)</li> <li><input type="checkbox"/> Cups, 9 oz (6)</li> <li><input type="checkbox"/> Food coloring, blue (3 drops)</li> <li><input type="checkbox"/> Graduated cylinder, 100 mL (1)</li> <li><input type="checkbox"/> Graduated cylinders, 50 mL (6)</li> <li><input type="checkbox"/> Gravel (2 cups)</li> <li><input type="checkbox"/> Jars with lids, clear plastic, 8 oz (3)</li> <li><input type="checkbox"/> Magnifiers, handheld, plastic (6)</li> <li><input type="checkbox"/> Measuring cup, 1 L (1)</li> <li><input type="checkbox"/> Measuring cup, dry, 1 cup (1)</li> <li><input type="checkbox"/> Measuring spoon, 1 tbsp (1)</li> <li><input type="checkbox"/> Rulers, metric (6)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Sand, coarse (2 cups)</li> <li><input type="checkbox"/> Spoon, plastic (1)</li> <li><input type="checkbox"/> Timers, digital (6)</li> <li><input type="checkbox"/> Water bottles, clear plastic, 16.9 oz (18)</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"/> Paper clips (54)</li> <li><input type="checkbox"/> Paper towels (12 sheets)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Tape, masking (partial roll)</li> <li><input type="checkbox"/> Water (900 mL)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 24 requires the food coloring and 1 L measuring cup.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 23 Resource A: Land and Water Interactions Investigation Setup Instructions</li> <li><input type="checkbox"/> Lesson 23 Resource B: Land and Water Interactions Investigation Procedure Sheet</li> <li><input type="checkbox"/> Lesson 23 Resource C: Underground Water Storage Demonstration Instructions</li> <li><input type="checkbox"/> Lesson 23 Resource D: Aquifer Diagram </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue             <ul style="list-style-type: none"> <li><input type="checkbox"/> Grand Canyon springs video (<a href="http://phdsci.link/2362">http://phdsci.link/2362</a>) ,</li> <li><input type="checkbox"/> rain pooling on pavement video (<a href="http://phdsci.link/2383">http://phdsci.link/2383</a>) , and</li> <li><input type="checkbox"/> rain absorbed by dirt video (<a href="http://phdsci.link/2384">http://phdsci.link/2384</a>) .</li> </ul> </li> <li><input type="checkbox"/> Prepare materials for land and water interactions investigation. (See Lesson 23 Resources A and B.)</li> <li><input type="checkbox"/> Prepare materials for underground water storage demonstration. (See Lesson 23 Resource C.)</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"/> Bin, clear plastic, 6 qt (1)</li> <li><input type="checkbox"/> Chenille stem, 12" (1)</li> <li><input type="checkbox"/> Cup, plastic, 3 oz (1)</li> <li><input type="checkbox"/> Food coloring, blue (5 drops)</li> <li><input type="checkbox"/> Gravel (5 cups)</li> <li><input type="checkbox"/> Measuring cup, 1 L (1)</li> <li><input type="checkbox"/> Spoon, plastic (1)</li> <li><input type="checkbox"/> Syringe, 60 mL (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pencil, sharp (1)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Water (1 L)</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 24 Resource A: Santa Cruz Riverbank Photographs </li> <li><input type="checkbox"/> Lesson 24 Resource B: Water Well Photographs </li> <li><input type="checkbox"/> Lesson 24 Resource C: Groundwater Extraction Demonstration Setup Instructions and Procedure</li> <li><input type="checkbox"/> Lesson 24 Resource D: Water Conservation Article </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare for the groundwater extraction demonstration. (See Lesson 24 Resource C.)</li> <li><input type="checkbox"/> Prepare to distribute a copy of Lesson 24 Resource D to each student.</li> </ul>


## Lesson 25

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <p>None</p> <p><b>School-Supplied Items</b></p> <p>None</p>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 25 Resource A: Grand Canyon National Park Visitor Center Photograph </li> <li><input type="checkbox"/> Lesson 25 Resource B: Map Highlighting Rhode Island's Location in the United States </li> <li><input type="checkbox"/> Lesson 25 Resource C: Rhode Island Energy Use Chart </li> <li><input type="checkbox"/> Lesson 25 Resource D: Map of Fossil Fuel Locations in the United States </li> <li><input type="checkbox"/> Lesson 25 Resource E: Conceptual Checkpoint </li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue aerial video of Providence, Rhode Island (<a href="http://phdsci.link/2391">http://phdsci.link/2391</a>). </li> <li><input type="checkbox"/> Prepare to distribute a copy of Lesson 25 Resource E to each student.</li> </ul>

## Lesson 26

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> <input type="checkbox"/> Glue sticks (24) <input type="checkbox"/> Scissors (24)
<b>Resources</b>	None
<b>Preparation</b>	None

## Lesson 27

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> None
<b>Resources</b>	<input type="checkbox"/> Lesson 27 Resource: Mississippi River Drainage Basin Map 
<b>Preparation</b>	None




## Lesson 28

<b>Materials</b>	<b>Kit Items</b> None  <b>School-Supplied Items</b> <input type="checkbox"/> Pencils or pens in 2 different colors (24 of each color) <input type="checkbox"/> Scissors (1)
<b>Resources</b>	<input type="checkbox"/> Lesson 28 Resource A: Module Concept Statements <input type="checkbox"/> Lesson 28 Resource B: Recurring Themes and Concepts
<b>Preparation</b>	<input type="checkbox"/> Score End-of-Module Assessments and write individual feedback. <input type="checkbox"/> Select End-of-Module Assessment responses to share with students. <input type="checkbox"/> Prepare visual for student connections between module learning and content standards. (See Lesson 28 Resources A and B.)




# Mixtures and Solutions | Lesson Preparation




## Lesson 1

<b>Materials</b>	<b>Kit Items</b> None <b>School-Supplied Items</b> None
<b>Resources</b>	<input type="checkbox"/> Lesson 1 Resource A: Turtle with Trash Photograph  <input type="checkbox"/> Lesson 1 Resource B: Environmental Scientist Photograph  <input type="checkbox"/> Lesson 1 Resource C: Pollution Photographs  <input type="checkbox"/> Lesson 1 Resource D: Water Pollution Articles
<b>Preparation</b>	<input type="checkbox"/> Print enough copies of water pollution texts for each student pair to receive one of the texts during the lesson. Half of the pairs should receive “The Problem with Plastics” (McGrath 2018). The other half should receive “Major Oil Spill” (Katzman 2021). (See Lesson 1 Resource D.)

## Lesson 2

<p><b>Materials</b></p>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Aluminum foil (partial roll)</li> <li><input type="checkbox"/> Bags, resealable plastic, clear, 1 gal (6)</li> <li><input type="checkbox"/> Bins, clear plastic, 6 qt (6)</li> <li><input type="checkbox"/> Bottles with caps, clear plastic, 16.9 oz (6)</li> <li><input type="checkbox"/> Cardboard, 2" × 2" (6)</li> <li><input type="checkbox"/> Coffee filters (6)</li> <li><input type="checkbox"/> Magnets (6)</li> <li><input type="checkbox"/> Plastic wrap (partial roll)</li> <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"/> Screws, steel (6)</li> <li><input type="checkbox"/> Straws, plastic (2)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Paper towels (6 sheets)</li> <li><input type="checkbox"/> Polystyrene foam, small pieces (6)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Water (access)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 3 requires 1 plastic bin, 1 plastic bottle, 2 polystyrene foam pieces, and plastic wrap.</li> </ul>
<p><b>Resources</b></p>	<p>None</p>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue plastic pollution in the ocean video (<a href="http://phdsci.link/2368">http://phdsci.link/2368</a>). </li> <li><input type="checkbox"/> Prepare materials for the observe and describe properties of matter investigation. Cut straws into 2" pieces. Cut coffee filter, plastic wrap, aluminum foil, and cardboard to size if necessary, and place a sample of each in a resealable plastic bag. Add bottle, polystyrene foam, and screw to the bag. Fill the plastic bin halfway with water. Prepare one bag of objects and one plastic container with water for each student group.</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"/> Bin, clear plastic, 6 qt (1)</li> <li><input type="checkbox"/> Bottle with cap, clear plastic, 16.9 oz (1)</li> <li><input type="checkbox"/> Cardboard, 2" × 2" (1)</li> <li><input type="checkbox"/> Containers of apple cider vinegar, black pepper, table salt, vegetable oil, and water (1 of each, for display)</li> <li><input type="checkbox"/> Cups, clear plastic, 9 oz (2)</li> <li><input type="checkbox"/> Plastic wrap (partial roll)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Scale, digital (1)</li> <li><input type="checkbox"/> Spoon, plastic (1)</li> <li><input type="checkbox"/> Straw, plastic (1)</li> </ul> <p><b>School-Supplied Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Paper towels (2 sheets)</li> <li><input type="checkbox"/> Pencil (1)</li> <li><input type="checkbox"/> Scissors (1)</li> <li><input type="checkbox"/> Polystyrene foam, small pieces (2)</li> <li><input type="checkbox"/> Water (access)</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 4 requires the prepared water pollution model and digital scale.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 1 Resource A: Turtle with Trash Photograph </li> <li><input type="checkbox"/> Lesson 1 Resource C: Pollution Photographs: Photographs 1 and 3 </li> <li><input type="checkbox"/> Lesson 3 Resource A: Mixtures Investigation Setup Instructions</li> <li><input type="checkbox"/> Lesson 3 Resource B: Water Pollution Model Setup Instructions</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue wastewater flowing into a water body video (<a href="http://phdsci.link/2372">http://phdsci.link/2372</a>). </li> <li><input type="checkbox"/> Prepare materials for mixtures investigation. (See Lesson 3 Resource A.)</li> <li><input type="checkbox"/> Prepare to display each material for mixtures investigation. (See Lesson 3 Resource A.)</li> <li><input type="checkbox"/> Prepare materials for measuring mass demonstration.</li> <li><input type="checkbox"/> Prepare materials for water pollution model. (See Lesson 3 Resource B.)</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"/> Black pepper, ground (60 g)</li> <li><input type="checkbox"/> Cups, clear plastic, 9 oz (25)</li> <li><input type="checkbox"/> Food coloring, green (3 drops)</li> <li><input type="checkbox"/> Magnifiers, handheld, plastic (6)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Scales, digital (6)</li> <li><input type="checkbox"/> Spoons, plastic (14)</li> <li><input type="checkbox"/> Table salt (80 g)</li> <li><input type="checkbox"/> Thermometer, Celsius (1)</li> <li><input type="checkbox"/> Vegetable oil (20 fl oz)</li> <li><input type="checkbox"/> Vinegar, apple cider (8 fl oz)</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"/> Paper towels (8 sheets)</li> <li><input type="checkbox"/> Water (16 fl oz)</li> <li><input type="checkbox"/> Water, cold (4 fl oz)</li> <li><input type="checkbox"/> Water, hot (8 fl oz)</li> </ul> <p><b>Prepared Items from Previous Lessons</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Water pollution model from Lesson 3</li> </ul> <p><b>Item Reuse</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 5 requires the permanent marker.</li> </ul>
<p><b>Resources</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 1 Resource C: Pollution Photographs: Photograph 2 </li> <li><input type="checkbox"/> Lesson 4 Resource A: Mixture Cards</li> <li><input type="checkbox"/> Lesson 4 Resource B: Water and Dye Mixture Demonstration Setup Instructions</li> </ul>
<p><b>Preparation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare to distribute mixture cards to groups for the mixtures investigation. (See Lesson 4 Resource A.)</li> <li><input type="checkbox"/> Prepare materials for the salt and water mixture demonstration by adding 20 g of table salt to one cup and 4 fl oz of water to a second cup.</li> <li><input type="checkbox"/> Prepare materials for the water and dye mixture demonstration. (See Lesson 4 Resource B.)</li> </ul>

## Lesson 5

<b>Materials</b>	<p><b>Kit Items</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Corn syrup (1 <math>\frac{1}{2}</math> cups)</li> <li><input type="checkbox"/> Cups, plastic, 3 oz (21)</li> <li><input type="checkbox"/> Cups, clear plastic, 9 oz (21)</li> <li><input type="checkbox"/> Marble, glass (1)</li> <li><input type="checkbox"/> Safety goggles, student (24)</li> <li><input type="checkbox"/> Safety goggles, teacher (1)</li> <li><input type="checkbox"/> Sand, coarse (1 <math>\frac{1}{2}</math> cups)</li> <li><input type="checkbox"/> Spoon, plastic (1)</li> <li><input type="checkbox"/> Vegetable oil (1 <math>\frac{1}{2}</math> cups)</li> <li><input type="checkbox"/> Washer, metal (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"/> Water (access)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 5 Resource A: Charles River Photograph </li> <li><input type="checkbox"/> Lesson 5 Resource B: Describe Relative Density Stations Setup Instructions</li> <li><input type="checkbox"/> Lesson 5 Resource C: Describe Relative Density Stations Procedure Sheets</li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Set up describe relative density stations. (Lesson 5 Resources B and C.)</li> </ul>

## Lesson 6

<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"/> Glue sticks (6)</li> <li><input type="checkbox"/> Scissors (1)</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Lesson 6 Resource A: Oil Spill Photograph </li> <li><input type="checkbox"/> Lesson 6 Resource B: Deepwater Horizon Map and Photograph </li> <li><input type="checkbox"/> Lesson 6 Resource C: Oil Spill Model </li> <li><input type="checkbox"/> Lesson 6 Resource D: Oil in the Environment Photographs </li> <li><input type="checkbox"/> Lesson 6 Resource E: Oil Burning Photograph </li> </ul>
<b>Preparation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cue oil spill video (<a href="http://phdsci.link/2398">http://phdsci.link/2398</a>). </li> <li><input type="checkbox"/> Prepare to distribute a color copy of Lesson 6 Resource C to each student.</li> </ul>

## Lesson 7

<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 7 Resource A: Content Standards</p> <p><input type="checkbox"/> Lesson 7 Resource B: Recurring Themes and Concepts</p>
<b>Preparation</b>	<p><input type="checkbox"/> Score End-of-Spotlight Assessment and write individual feedback.</p> <p><input type="checkbox"/> Select End-of-Spotlight Assessment responses to share with students for additional support. If selecting student responses, remember to remove identifying information and choose diverse student responses.</p> <p><input type="checkbox"/> Prepare visual for student connections between content standards and recurring themes and concepts. (See Lesson 7 Resources A and B.)</p>

## Earth Features | Works Cited

Buckley, James, Jr. 2014. *Who Were the Wright Brothers?* New York: Grosset & Dunlap.

Chin, Jason. 2017. *Grand Canyon*. New York: Roaring Brook Press.

Lusted, Marcia Amidon. 2016. "The Hoover Dam: Controlling Water in the West." *Cobblestone*. April 2016, 16–19. Adapted with permission.

National Park Service (NPS). 2009. "Over the Rim, Into the Canyon." NPS.gov: Grand Canyon National Park, video, 0:58. <https://www.nps.gov/media/video/view.htm?id=C2A43648-155D-451F-6722A3EAFE93E679>.

## Mixtures and Solutions | Works Cited

Katzman, Rebecca. 2021. "Major Oil Spill." *Time for Kids*. October 15, 2021. Adapted with permission.

McGrath, Brian S. 2018. "The Problem with Plastics." *Time for Kids*. April 13, 2018. Adapted with permission.