

**Notes**

Read and select facilitation questions as appropriate to meet your students' needs.

Phase	Instructional Grouping	Materials
<b>Engage</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Engage: Subatomic Particles</b></li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Explore: Bingo Call List</b></li> <li>• <b>Explore: Element Challenge Cards</b></li> <li>• Small, plastic resealable bag</li> <li>• Projector</li> <li>• <b>Explore: Element Challenge Answer Key</b></li> <li>• <b>Explore: Bingo Card</b> (Optional: Make double-sided copies for additional game.)</li> <li>• <b>Explore: Periodic Table</b></li> </ul>
<b>Explain</b>	Whole group Individual	<ul style="list-style-type: none"> <li>• <b>Explore: Periodic Table</b></li> <li>• Science notebook</li> </ul>
<b>Elaborate</b>	Student pairs	<ul style="list-style-type: none"> <li>• <b>Elaborate: Element Cards</b></li> <li>• Small, plastic resealable bag</li> <li>• <b>Elaborate: Reactivity of Elements</b></li> <li>• <b>Explore: Periodic Table</b></li> </ul>
	Teacher-led student group	<ul style="list-style-type: none"> <li>• 18–24 pennies or objects to cover element tiles on the Periodic Table</li> <li>• <b>Explore: Periodic Table</b> (prepared)</li> <li>• Colored pencils</li> </ul>
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Element Identities</b></li> <li>• <b>Explore: Periodic Table</b></li> </ul>

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Phase	Instructional Grouping	Materials
Engage	Individual Student pairs	<ul style="list-style-type: none"> <li>• <b>Engage: Matter Mix-Match-Mingle</b></li> </ul>
Explore	Small groups	<ul style="list-style-type: none"> <li>• <b>Explore: Eggs-tracting the Elements Activity Card</b> per group</li> <li>• 6 small fillable plastic eggs, small containers with lids, or small plastic Petri dishes per group</li> <li>• 4 large pink pony beads, 2 large blue pony beads, 4 large green pony beads, 8 large purple pony beads, 14 large black pony beads, 2 large orange pony beads, 27 large white pony beads per group</li> <li>• 1 paper or plastic plate per group</li> <li>• 1 large resealable plastic bag per group</li> <li>• <b>Explore: Eggs-tracting the Elements</b></li> <li>• Periodic Table</li> </ul>
Explain	Whole group Individual	<ul style="list-style-type: none"> <li>• Periodic Table</li> <li>• Small white board or reusable plastic plate for each student</li> <li>• Dry erase markers</li> <li>• <b>Explain: Counting Atoms</b></li> </ul>
Elaborate	Individual	<ul style="list-style-type: none"> <li>• <b>Elaborate: What's My Chemical Formula?</b></li> <li>• Periodic Table</li> </ul>
	Teacher-led student group	<ul style="list-style-type: none"> <li>• <b>Elaborate: What's My Chemical Formula?*</b></li> <li>• <b>Counting Atoms Chart*</b></li> <li>• Periodic Table</li> </ul>
Evaluate	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Figuring Out Formulas</b></li> </ul>

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Phase	Instructional Grouping	Materials
<b>Engage</b>	Small groups Individual	<ul style="list-style-type: none"> <li>• <b>Engage: Example/Nonexample</b></li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Before and After Setup Instructions Chart</b></li> <li>• <b>Explore: Before and After Mat</b></li> <li>• <b>Explore: Before and After Student Sheet</b></li> <li>• Chemical splash goggles</li> <li>• Permanent marker</li> <li>• Snack-sized resealable plastic bags</li> <li>• 25 mL graduated cylinder</li> <li>• Triple-beam balance</li> <li>• Thermometer</li> <li>• Glue or duct tape (optional)</li> <li>• 10 Petri dishes with lids or resealable plastic bags</li> <li>• Matches</li> <li>• 2 sheets of paper</li> <li>• Food color</li> <li>• Water</li> <li>• 2 steel wool pads</li> <li>• Ice</li> <li>• 6 index cards</li> <li>• 2 glow sticks (may need additional sticks)</li> <li>• 2 clear jars or clear plastic water bottles with lids (large enough to hold a glow stick)</li> <li>• Calcium chloride (can be purchased as a moisture remover at local stores)</li> <li>• Epsom salts</li> <li>• 8 test tubes with stoppers or small, clear containers with lids</li> <li>• 3 test tube racks (optional)</li> <li>• Milk</li> <li>• Vinegar</li> <li>• Vegetable oil</li> <li>• Yeast</li> <li>• Sugar</li> <li>• 2 balloons</li> <li>• Erlenmeyer flask or similar clear container or bottle</li> </ul>

Phase	Instructional Grouping	Materials
Explain	Whole-group Individual	<ul style="list-style-type: none"> <li>• <b>Explore: Before and After Student Page</b></li> <li>• Unlined paper or <b>Explain: Folded Model</b></li> <li>• Scissors</li> <li>• Color pencils (optional)</li> </ul>
	Small groups	<ul style="list-style-type: none"> <li>• <b>Elaborate: Camp Out!</b></li> <li>• Red and blue color pencils</li> </ul>
Elaborate	Teacher-led student group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Camp Out!</b></li> <li>• Red and blue color pencils</li> <li>• <b>Elaborate: Bookmark Hints!*</b></li> <li>• Scissors</li> <li>• Tape or glue (optional)</li> </ul>
	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Reacting Chemically</b></li> </ul>

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Phase	Instructional Grouping	Materials
<b>Engage</b>	Individual Whole group	<ul style="list-style-type: none"> <li>• <b>Engage: Force and Motion Anticipation Guide</b></li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Explore: Changing Motion</b></li> <li>• Access to a variety of materials students can use during the investigation (different types of balls, rulers, meter sticks, blocks, etc.)</li> </ul>
<b>Explain</b>	Whole group	<ul style="list-style-type: none"> <li>• <b>Engage: Force and Motion Anticipation Guide</b></li> <li>• Rolling chair</li> </ul>
<b>Elaborate</b>	Individual Small groups	<ul style="list-style-type: none"> <li>• <b>Elaborate: Calculating Forces</b></li> </ul>
	Teacher-led student group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Calculating Forces</b></li> </ul>
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: A Change Is Going to Come</b></li> </ul>

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Phase	Instructional Grouping	Materials
Engage	Small groups	<ul style="list-style-type: none"> <li>• <b>Engage: Going for a Ride</b></li> </ul>
Explore	Small groups	<ul style="list-style-type: none"> <li>• Tennis ball</li> <li>• Small jar or bottle</li> <li>• Embroidery hoop</li> <li>• Coin or washer</li> <li>• Ruler with center groove</li> <li>• 20–30 marbles</li> <li>• Block or book</li> <li>• 4–5 small foam or plastic cups</li> <li>• 2 meter sticks</li> <li>• Small toy car</li> <li>• 3 push/pull spring scales</li> <li>• Flat tray or cookie sheet</li> <li>• Pull-back or wind-up toy car</li> <li>• Piece of cardboard</li> <li>• <b>Explore: Newton's Stations</b></li> </ul>
Explain	Whole group	<ul style="list-style-type: none"> <li>• Blank paper</li> <li>• Scissors</li> <li>• Hole puncher (optional)</li> </ul>
Elaborate	Small groups	<ul style="list-style-type: none"> <li>• <b>Elaborate: Describing Newton's Laws</b></li> </ul>
	Teacher-led small group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Describing Newton's Laws</b></li> </ul>
Evaluate	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Moving Right Along</b></li> </ul>

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<b>Engage</b>	Small groups	<ul style="list-style-type: none"> <li>• Flashlight</li> <li>• Opaque ball such as a tennis ball or baseball</li> <li>• Paper</li> <li>• Ruler (optional)</li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• 8 plastic table tennis or plastic golf balls</li> <li>• Hoop toy or other round frame</li> <li>• 8 hook and loop adhesive circles</li> <li>• Black permanent marker or paint</li> <li>• Hot glue or super glue (optional)</li> <li>• Resealable plastic bag</li> </ul>
<b>Explain</b>	Small groups	<ul style="list-style-type: none"> <li>• Materials from Explore activity</li> <li>• <b>Explain: Modeling Moon Phases</b></li> <li>• <b>Explain: Moon Phase Spinner</b></li> <li>• Brass paper fastener</li> <li>• Scissors</li> </ul>
<b>Elaborate</b>	Small groups	<ul style="list-style-type: none"> <li>• 3 different-sized spheres to represent the Sun, Earth, and Moon</li> <li>• <b>Elaborate: Lunar Phase Dice</b></li> <li>• <b>Elaborate: Lunar Phase Game</b>, laminated</li> <li>• <b>Elaborate: Lunar Phase Game Student Page</b></li> <li>• Scissors</li> <li>• Tape or glue</li> </ul>
	Teacher-led small group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Lunar Phase Game Student Page*</b></li> </ul>
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: It's Just a Phase</b></li> </ul>

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**Lesson 7**  
**Grade 8**

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Phase	Instructional Grouping	Materials
<b>Engage</b>	Individual Whole group	<ul style="list-style-type: none"> <li>• Projector</li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Explore: Fishing in the Universe</b></li> <li>• <b>Explore: Fishing in the Universe Rules</b></li> </ul>
<b>Explain</b>	Small groups Whole group	<ul style="list-style-type: none"> <li>• Chart paper</li> <li>• Markers</li> <li>• Masking tape</li> </ul>
<b>Elaborate</b>	Individual Student pairs	<ul style="list-style-type: none"> <li>• <b>Elaborate: Hertzsprung-Russell Diagram</b></li> <li>• Color pencils</li> </ul>
	Teacher-led small group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Hertzsprung-Russell Diagram</b></li> <li>• Color pencils</li> </ul>
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Trekking through the Universe</b></li> </ul>

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Phase	Instructional Grouping	Materials
<b>Engage</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Engage: Land Feature Cards</b></li> <li>• <b>Engage: Land Feature Photographs</b></li> <li>• Resealable envelope or plastic resealable bag</li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Explore: Description Cards</b></li> <li>• Play dough</li> <li>• Wax paper</li> <li>• Video recording device (such as a digital camera)</li> <li>• Digital or overhead projector</li> </ul>
<b>Explain</b>	Small groups Whole group	<ul style="list-style-type: none"> <li>• Land feature model from Explore</li> <li>• Projector or document camera</li> <li>• Wax paper</li> <li>• <b>Engage: Land Feature Photographs</b></li> <li>• Satellite views of land features from the Internet</li> <li>• <b>Explore: Description Cards</b></li> </ul>
<b>Elaborate</b>	Individual Student pairs	<ul style="list-style-type: none"> <li>• <b>Elaborate: Predicting Land Changes</b></li> <li>• <b>Engage: Land Feature Photographs</b> (optional)</li> </ul>
	Teacher-led student group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Predicting Land Changes</b></li> <li>• <b>Elaborate: Choices*</b></li> <li>• Glue</li> <li>• Scissors</li> <li>• Additional play dough (optional)</li> <li>• Play dough model of mountain</li> <li>• Play dough model of canyon</li> </ul>
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Land over Time</b></li> </ul>

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<b>Engage</b>	Individual	<ul style="list-style-type: none"> <li>• Number cubes</li> <li>• <b>Engage: Create Your Ecosystem</b></li> <li>• Highlighter or light-colored marker</li> </ul>
<b>Explore</b>	Individual Small groups	<ul style="list-style-type: none"> <li>• Completed <b>Engage: Create Your Ecosystem</b></li> <li>• <b>Explore: Creature Features</b></li> <li>• Color pencils</li> </ul>
<b>Explain</b>	Small groups	<ul style="list-style-type: none"> <li>• Completed <b>Engage: Create Your Ecosystem</b></li> </ul>
<b>Elaborate</b>	Individual Small groups	<ul style="list-style-type: none"> <li>• <b>Elaborate: Island Guide</b></li> <li>• <b>Elaborate: Island Guide Instructions</b></li> <li>• <b>Elaborate: Islands' Characteristics</b></li> </ul>
	Teacher-led student group	<ul style="list-style-type: none"> <li>• <b>Elaborate: Island Guide*</b></li> <li>• <b>Elaborate: Island Guide Instructions*</b></li> <li>• <b>Elaborate: Islands' Characteristics</b></li> </ul>
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Dependence and Competition</b></li> </ul>

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<b>Engage</b>	Whole group	<ul style="list-style-type: none"> <li>• <b>Engage: Environmental Changes</b></li> </ul>
<b>Explore</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Explore: Survival Stations</b></li> <li>• <b>Explore: Survival Stations Lab Cards</b></li> <li>• 6 types of dried beans (choose a variety of colors and sizes)</li> <li>• Small containers or resealable plastic bags</li> <li>• Tape</li> <li>• Flat disposable grill pan with holes or similar container tray with holes</li> <li>• 3 flat trays</li> <li>• Light-colored cloth or surface</li> <li>• Dark-colored cloth or surface</li> <li>• 3–4 disposable spoon straws</li> <li>• 3 timers</li> <li>• Red, yellow, and green color pencils</li> </ul>
<b>Explain</b>	Whole group Small groups or student pairs	<ul style="list-style-type: none"> <li>• Completed <b>Explore: Survival Stations</b></li> <li>• <b>Explain: Venn Folded Model</b></li> <li>• Scissors</li> </ul>
<b>Elaborate</b>	Small groups	<ul style="list-style-type: none"> <li>• <b>Elaborate: Traits in Subsequent Populations</b></li> <li>• <b>Elaborate: Long-Term Environmental Changes</b></li> <li>• 6 types of dried beans (choose a variety of colors and sizes)</li> <li>• Small containers or resealable plastic bags</li> <li>• Tape</li> <li>• Patterned cloth or surface per group</li> <li>• 2–3 pairs of laboratory tongs or kitchen tongs with scissor-style handle</li> <li>• Flat tray per group</li> <li>• Timer per group</li> <li>• Red, yellow, and green color pencils</li> </ul>
	Teacher-led student group	
<b>Evaluate</b>	Individual	<ul style="list-style-type: none"> <li>• <b>Evaluate: Who's a Survivor?</b></li> </ul>