

Core Ideas, Topics and Titles	Established Goals	Understandings of Concepts	Essential Questions	Students will be able to: (Outcomes)
<b>GRADE FOUR</b>				
<p><b>Core Idea: Wave Properties, PS4A</b></p> <p><b>Topic: Waves</b></p> <p><b>Title: <i>Earth Waves: What is a Wave?</i>- Lesson 1</b></p>	<ul style="list-style-type: none"> <li>Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.</li> </ul>	<ul style="list-style-type: none"> <li>A wave is a repeating pattern of motion that transfers energy.</li> <li>The two types of waves are transverse and longitudinal waves.</li> </ul>	<ul style="list-style-type: none"> <li>What is a wave?</li> <li>What are the two types of waves?</li> </ul>	<ul style="list-style-type: none"> <li>Students will demonstrate the difference between transverse and longitudinal waves using a slinky.</li> </ul>
<p><b>Core Idea: Wave Properties, PS4A</b></p> <p><b>Topic: Waves</b></p> <p><b>Title: <i>Earth Waves: What is an Earthquake?</i> – Lesson 2</b></p>	<ul style="list-style-type: none"> <li>Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.</li> <li>Earthquakes cause seismic waves, which are waves of motion in the Earth’s crust.</li> </ul>	<ul style="list-style-type: none"> <li>Seismic waves consist of longitudinal, transverse and surface waves.</li> <li>The longitudinal waves are called P waves.</li> <li>The transverse waves are called S waves.</li> <li>As seismic waves radiate outward from the source they dissipate.</li> <li>Surface waves move along the surface and are the slowest waves and most dangerous.</li> </ul>	<ul style="list-style-type: none"> <li>What causes an earthquake?</li> <li>Why do people feel vibrations when there is an earthquake?</li> <li>What are longitudinal, transverse and surface waves?</li> </ul>	<ul style="list-style-type: none"> <li>Students will explain what causes an earthquake.</li> <li>Students will explain why people feel vibrations when an earthquake occurs.</li> <li>Students will explain what an epicenter is.</li> </ul>
<p><b>Core Idea: Wave Properties, PS4A, 5.3</b></p> <p><b>Topic: Waves</b></p> <p><b>Title: <i>Earth Waves: Plate Tectonics</i> – Lesson 3</b></p>	<ul style="list-style-type: none"> <li>Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.</li> <li>Earthquakes cause seismic waves, which are waves of motion in Earth’s crust.</li> </ul>	<ul style="list-style-type: none"> <li>A divergent boundary is when plates move away from each other and new crust is developed.</li> <li>A convergent boundary is when plates move toward each other and volcanoes and mountains are formed.</li> <li>A transform boundary is when plates rub against each other and one moves up while the other moves down.</li> </ul>	<ul style="list-style-type: none"> <li>What are plate tectonics?</li> <li>What are the three boundaries which occur when plates move?</li> <li>How can plates move?</li> </ul>	<ul style="list-style-type: none"> <li>Students will demonstrate the three ways plates can move using graham crackers.</li> </ul>

<p><b>Core Idea: Electromagnetic Radiation, PS4B</b></p> <p><b>Topic: Light</b></p> <p><b>Title: <i>Seeing Colors</i></b></p>	<ul style="list-style-type: none"> <li>• An object can be seen when light reflected from its surface enters the eyes.</li> <li>• The color people see depends on the color of the available light sources, as well as the properties of the surface.</li> </ul>	<ul style="list-style-type: none"> <li>• Light travels in waves.</li> <li>• You can see an object because light is reflecting off of its surface and entering your eyes.</li> <li>• The color people see depends on the color of the available light source.</li> </ul>	<ul style="list-style-type: none"> <li>• Can you change how an object looks by changing the color of it?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will create a secret message that can only be read through the use of light.</li> </ul>
<p><b>Core Idea: Electromagnetic Radiation, PS4B</b></p> <p><b>Topic: Light Waves</b></p> <p><b>Title: <i>Magnified Objects</i></b></p>	<ul style="list-style-type: none"> <li>• Because lenses bend light beams, they can be used singly or in combination, to provide magnified images of objects too small or too far away to be seen with the naked eye.</li> </ul>	<ul style="list-style-type: none"> <li>• Lenses bend light and make it appear larger.</li> <li>• Lenses can be used singly or in combination to magnify images of objects too small or too far away to be seen with the naked eye.</li> </ul>	<ul style="list-style-type: none"> <li>• How can you use lenses to see things that are too small or too far away to be seen clearly?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will construct a device that will allow them to read a message too small to be seen by the naked eye.</li> </ul>
<p><b>Core Idea: Information Technologies and Instrumentation, PS4C</b></p> <p><b>Topic: Communication</b></p> <p><b>Title: <i>Quicker Communication: What is a Code? – Lesson 1</i></b></p>	<ul style="list-style-type: none"> <li>• Communication systems, many of which use digitized signals, is a more reliable way to convey information.</li> <li>• Signals that humans cannot sense directly can be detected by appropriately designed devices.</li> <li>• When in digitized form, information can be recorded, stored for future recovery, and transmitted over long distances without significant degradation.</li> </ul>	<ul style="list-style-type: none"> <li>• Morse code is a method of communication.</li> <li>• A telegraph works by breaking the circuit</li> <li>• Through the use of a telegraph, coded messages can be sent over a distance.</li> </ul>	<ul style="list-style-type: none"> <li>• What is a code?</li> <li>• What are the steps for communicating?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to explain how the telegraph is a communication system, how it transmits a message by interrupting a circuit, and the benefits of the telegraph.</li> </ul>

<p><b>Core Idea: Information Technologies and Instrumentation, PS4C</b></p> <p><b>Topic: Communication</b></p> <p><b>Title: <i>Quicker Communication: The Telegraph – Lesson 2</i></b></p>	<ul style="list-style-type: none"> <li>• Communication systems, many of which use digitized signals, is a more reliable way to convey information.</li> <li>• Signals that humans cannot sense directly can be detected by appropriately designed devices.</li> <li>• When in digitized form, information can be recorded, stored for future recovery, and transmitted over long distances without significant degradation.</li> </ul>	<ul style="list-style-type: none"> <li>• Morse code is a method of communication.</li> <li>• A telegraph works by breaking the circuit.</li> <li>• Through the use of a telegraph, coded messages can be sent over a distance.</li> </ul>	<ul style="list-style-type: none"> <li>• How does a communication system send and receive a message?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to explain what a code is.</li> <li>• Students will be able to name the steps of a communication system.</li> </ul>
<p><b>Core Idea: Information Technologies and Instrumentation, PS4C</b></p> <p><b>Topic: Communication</b></p> <p><b>Title: <i>Quicker Communication: Exploring the Telegraph – Lesson 3</i></b></p>	<ul style="list-style-type: none"> <li>• Communication systems, many of which use digitized signals, is a more reliable way to convey information.</li> <li>• Signals that humans cannot sense directly can be detected by appropriately designed devices.</li> <li>• When in digitized form, information can be recorded, stored for future recovery, and transmitted over long distances without significant degradation.</li> </ul>	<ul style="list-style-type: none"> <li>• Morse code is a method of communication.</li> <li>• A telegraph works by breaking the circuit.</li> <li>• Through the use of a telegraph, coded messages can be sent over a distance.</li> </ul>	<ul style="list-style-type: none"> <li>• How does a communication system send and receive a message?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will be able to explain how the telegraph is a communications system, how it transmits a message by interrupting a circuit, and the benefits of the telegraph.</li> </ul>