

CORE IDEAS	Established Goals	Understanding of Concepts	Essential Questions	Students Outcomes
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GRADE SEVEN and EIGHT

<p>Core Idea: Wave Properties PS4-A</p> <p>Topic: Mechanical Waves</p> <p>Title: <i>Mechanical Waves: Lessons 1 & 2</i></p>	<ul style="list-style-type: none"> • A simple wave has a repeating pattern with a specific wave length, frequency and amplitude. • A sound wave needs a medium to travel through which it is transmitted. 	<ul style="list-style-type: none"> • Wave is distortion or disturbance that carries energy in a material or medium. • Types of waves are mechanical and electromagnetic. • Seismic waves are produced by movement of tectonic plates. 	<ul style="list-style-type: none"> • How do waves behave? • Where can we find waves in our everyday life? 	<ul style="list-style-type: none"> • Identify types of waves. • Explain common characteristics of waves.
<p>Core Idea: Information Technologies and Instrumentation PS4.B; ETS1.A; ETS1.B</p> <p>Topic: Earthquakes and Early Warning Systems</p> <p>Title: <i>Seismic Waves and Early Warning Systems: Lessons 3 & 4</i></p>	<ul style="list-style-type: none"> • Appropriate designed technology make it possible to detect and interpret many types of signals that cannot be sensed directly. • Designers of such devices must understand the system and its interaction with matter. 	<ul style="list-style-type: none"> • Seismic waves can be measured using technological early warning system consisting of seismographs. 	<ul style="list-style-type: none"> • Is understanding and measurement of waves beneficial to society? • Why are earthquakes devastating to society? • How do engineers get messages to individuals and communities about possible earthquakes? • How difficult is it to warn individuals and communities? 	<ul style="list-style-type: none"> • Analyze tools to measure earthquakes. • Build a seismograph. • Interpret data from network of seismographic and longitudinal coordinates. • Triangulate coordinates. • Develop, execute and explain an early warning system.

<p>Core Idea: Communication Engineering PS4.A; ETS1.A; ETS2.B.</p> <p>Topic: Communication Systems</p> <p>Titles: <i>Model of a Communication System, Lesson 1</i> <i>Different Types of Communication Systems, Lesson 2</i> <i>Ancient Forms of Coding, Lesson 3</i> <i>Writing Code for the Telegraph System, Lessons 4 & 5</i></p>	<ul style="list-style-type: none"> • PS4.A • ETS1.A • ETS2.B 	<ul style="list-style-type: none"> • Communication is a critical skill that helps us function in the world, overcome barriers and cooperate with others. • It is how our thoughts, feelings and ideas are understood by other people. • Waves used in transmission of information may be EM waves or mechanical waves. 	<ul style="list-style-type: none"> • What is a communication system? • What are some examples of communication systems? • What aspects make a communication system effective? 	<ul style="list-style-type: none"> • Draw a circuit diagram for a laboratory-based telegraph system. • Explain the elements that make communication systems effective. • Design a two-way communication system, and use Morse Code to encode and decode messages.