

**Essential Questions**

How can you predict something with many factors?  
How can you know about something you can't see?  
How do rules of physics affect us daily?

- I could teach it
- I somewhat get it
- I need to learn this

**Glue this side into your notebook**



**The things I should know before 8<sup>th</sup> grade:**

- Different types of rocks (igneous, sedimentary, metamorphic) are caused by different mechanisms
- Thermal energy can change properties of matter and all energy can be transferred throughout the Earth and into other forms
- There are different kinds of waves – electromagnetic and seismic are two examples

**The most basic things I should know after this unit**

- The rules of physics affect everything made of matter and energy and can be used to predict things.
- Waves have certain properties and behaviors that can help us understand the inside of the Earth.
- The Earth's interior is made up of different layers with different properties, and each layer is not uniform and transitions to the next.
- Earthquake waves travel differently through different layers of Earth

**The things that are important to know and do for assessments**

a. The refraction and reflection of seismic waves as they move through one type of material to another is used to differentiate the layers of Earth's interior. Earth has an inner and outer core, an upper and lower mantle, and a crust.

- Understand the different properties and behaviors (specifically reflection and refraction) of mechanical waves and use this information to describe seismic waves
- Using data and experiences, explain how seismic waves behave in matter with different properties and predict their direction and/or speed**
- Using data and experiences related to seismic waves, understand the different layers of Earth and their properties (their relative densities and states of matter) and understand how scientists have gained this knowledge of the Earth in this way**

b. The formation of the planet generated heat from gravitational energy and the decay of radioactive elements, which are still present today. Heat released from Earth's core drives convection currents throughout the mantle and the crust.

- Explain how matter and energy are transferred through the interior of the Earth, including thermal, radioactive, and seismic energy and convection currents**
- Using data and experiences, explain what caused the Earth and other planets to form**

**Good to know**

- Know definitions and characteristics of P-waves and S-waves

**Vocabulary to Master**

<input type="checkbox"/> wave	<input type="checkbox"/> reflection
<input type="checkbox"/> refraction	<input type="checkbox"/> diffraction
<input type="checkbox"/> mechanical wave	<input type="checkbox"/> amplitude
<input type="checkbox"/> compression	<input type="checkbox"/> rarefaction
<input type="checkbox"/> period	<input type="checkbox"/> wavelength
<input type="checkbox"/> crest	<input type="checkbox"/> trough
<input type="checkbox"/> frequency	<input type="checkbox"/> inner core
<input type="checkbox"/> outer core	<input type="checkbox"/> crust
<input type="checkbox"/> upper mantle	<input type="checkbox"/> lower mantle
<input type="checkbox"/> lithosphere	<input type="checkbox"/> asthenosphere
<input type="checkbox"/> P-wave	<input type="checkbox"/> S-wave
<input type="checkbox"/> seismic wave	<input type="checkbox"/> thermal energy
<input type="checkbox"/> planetary differentiation	<input type="checkbox"/> radioactive energy
<input type="checkbox"/> seismic profile	<input type="checkbox"/> radiation
<input type="checkbox"/> convection	<input type="checkbox"/> conduction
<input type="checkbox"/> density	<input type="checkbox"/> body/surface wave