Properties of Waves

Think about the last time you experienced a wave. It may have been at the beach, from an earthquake, or even just standing outside in the sun!

All of those waves have one thing in common: they are all a transfer of energy. In a wave, it is not matter that is being transferred from one place to another; it is just energy that is transferring. There are mechanical waves, like the ones in the ocean or the ground. These waves require a medium (substance) in order to travel. That medium can be a solid, liquid, or a gas. The

The particles of the medium vibrate back and forth in the same area as the energy travels through. This is why a duck floating in the middle of a lake just bobs up and down as a wave passes by, instead of ending up at the shore.

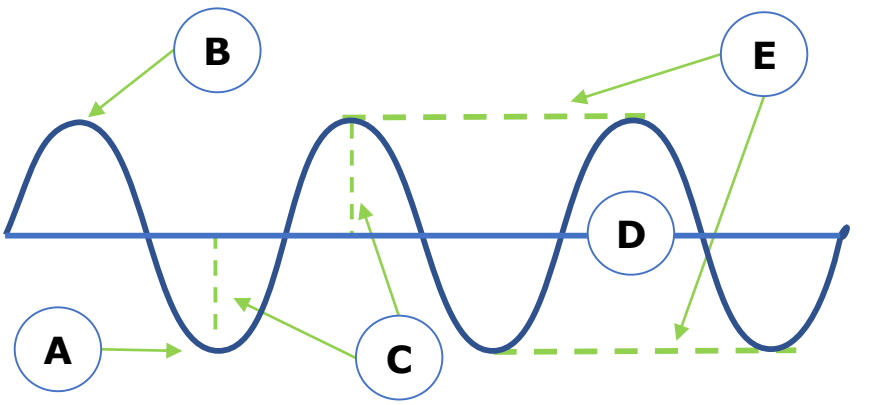
The waves from the Sun are electromagnetic waves; they do not require a medium. This means that they do not require matter in order to travel.

1. How can you tell the waves from the Sun are electromagnetic waves?

We are going to focus on two types of mechanical waves today: transverse and longitudinal waves. In a transverse wave, the vibrating matter moves at right angles to the direction the energy is traveling. So if the energy is traveling to the right, the matter will be vibrating up and down. In a longitudinal wave, the vibrating matter moves in the same direction as the energy. So if the energy is traveling to the right, the particles will be vibrating back and forth to the left and right. There are several parts to each type of wave.

Transverse Waves

Label the following parts of the transverse wave to the right:



____ **2. Rest Position -** where the medium shows no disturbance; the midline of the wave.

____ **3. Crest -** The highest point on a wave

____ **4. Trough -** The lowest point on a wave

____ **5. Amplitude -** A measure of the amount of energy in a wave. Measured from the rest position to either a crest or a trough.

____ **6. Wavelength -** The distance between two similar points on a wave. Ex: crest to crest or trough to trough.

Which way could the energy be moving?

7 . _____

Which way would the particles be moving?

8. _____