17.1 Mechanical Waves

**Unit:** 5 - Waves

### Learning Objectives:

### Define mechanical waves and relate waves to energy.

### Describe transverse, longitudinal and surface waves.

### Identify examples of transverse and longitudinal waves.

### Analyze the motion of a medium as each king of mechanical waves passes through it.

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### Language Objectives:

* Understand and correctly use the terms “Mechanical Wave”, “Medium”, “crest”, “trough”, “transverse wave”, “compression”, “rarefication” “longitudinal wave”, “surface wave”

### Notes: What are mechanical waves?

A **mechanical wave** is a \_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_that carries \_\_\_\_\_\_\_\_\_ from one place to another.

* + The material through which a wave travels is called a **\_\_\_\_\_\_\_\_\_\_**
  + Mechanical waves require a medium to travel through. \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_all can act as mediums.
  + A vibration is a repeating back-and-forth motion

**Why causes a mechanical wave?**

A mechanical wave is created when a source of energy causes a \_\_\_\_\_\_\_\_\_\_\_\_\_\_to travel through a medium.

**Three main types of mechanical waves**

1.

2. 3.

**What is the criteria is used to classify mechanical waves?**

Mechanical waves are classified by the way they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a medium.

**Let’s Talk About Transverse**

When you shake one end of a rope up and down, the vibration causes a wave.

* + The highest point of the wave is the \_\_\_\_\_\_\_\_\_\_
  + The lowest point of the wave is the \_\_\_\_\_\_\_\_\_\_\_\_\_
  + A single point on the rope vibrates up and down between a crest and trough.

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A transverse wave is a wave that causes the medium to vibrate at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the direction in which the wave travels.

The wave carries \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from left to right, in a direction perpendicular to the up-and-down motion of the rope.

**Longitudinal Waves**

In a spring toy, the wave carries energy along the spring.

* + An area where the particles in a medium are spaced close together is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + An area where the particles in a medium are spread out is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



**More on Longitudinal Waves**

As compressions and rarefactions travel along the spring, each coil vibrates back and forth around its rest position.

A longitudinal wave is a wave in which the vibration of the medium is \_\_\_\_\_\_ to the direction the wave travels.

**Surface Waves**

\_\_\_\_\_\_\_\_\_\_\_\_waves are the most familiar kind of surface waves.

A surface wave is a wave that travels along a surface separating two media.

