

UNIT 9 – WAVES

A **wave** is described as a _____ that transmits energy from one point to another.

The material through which a wave moves is called a _____.

Examples:

If there is no disturbance, the medium will be at rest or remain in its _____ position.

Waves Categories

1) Electromagnetic Waves

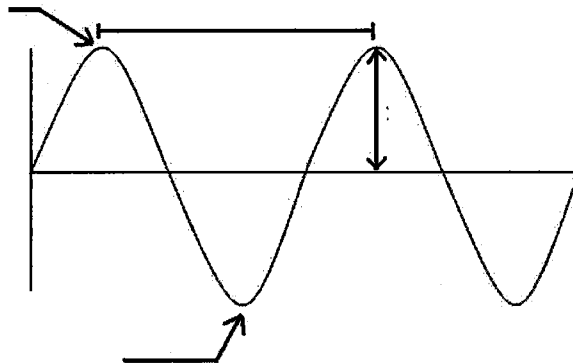
- Capable of transmitting energy through a vacuum (empty space - no medium needed)
- they travel through space at the **speed of light** _____
- they cannot be observed directly
- Examples: _____

2) Mechanical Waves

- Require a medium to transmit energy from one location to another.
- 3 classification of mechanical waves: transverse, longitudinal and surface waves

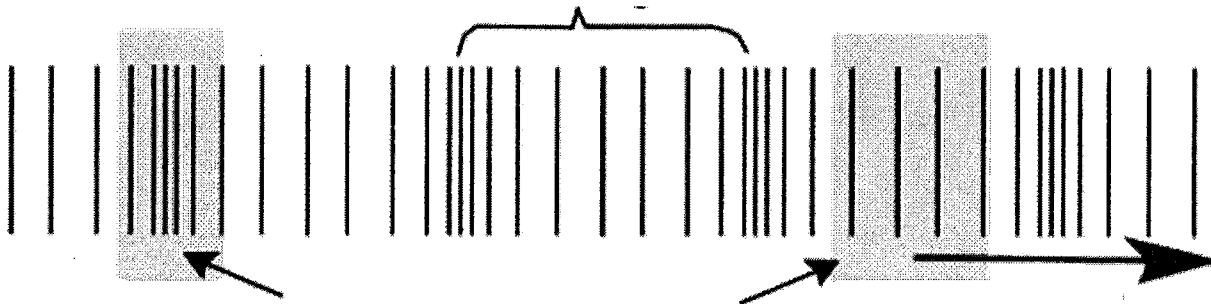
A) Transverse Waves

- The particles of the medium move _____ to the direction of the wave motion.
- Examples: _____



B) Longitudinal Waves

- The particles of the medium move _____ to the direction of the wave motion. The molecules are being compressed and then stretched apart to move the energy from place to place.
- Examples: _____



C) Surface Waves

- Mixture of transverse and longitudinal waves.

Properties of Waves

1) Wavelength

- length for one complete wave cycle
- the distance between adjacent points on a wave (between two crests or troughs)
- symbol _____
- measured in _____

2) Frequency

- Often referred to as how often something happens
- Since all waves are caused by vibrations, we can describe frequency as:

- symbol _____
- measured in _____

3) Period

- Often refers to the time it takes for something to happen.
- Time required for one complete cycle or rotation
 - Example: Earth takes 24 hours for one complete rotation
- symbol _____
- measured in _____

Frequency refers to how often something happens and **period** refers to the time it takes for something to happen.

Relationship between Frequency and Period:

4) Wave Speed

- How fast a crest/trough moves past a fixed point.

Example 1: Freddy the fly flaps his wings back and forth 121 times each second. What is the frequency and period of the wing?

Example 2: A sound wave has a frequency of 262 Hz and a wavelength of 1.29 m. What is the speed of the wave?

Example 3: What is the frequency of a blue light which has a wavelength of 410 nm?