

Waves



A Wave is....

- a disturbance, a transfer of energy that travels from one place to another.

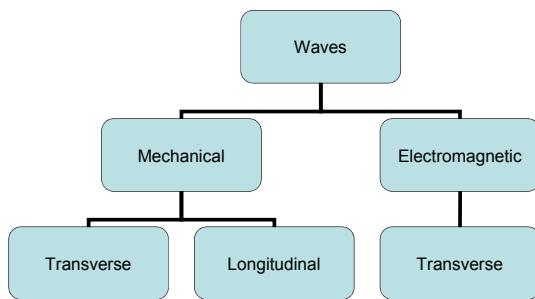
Wave Pulse

- A single disturbance that moves through the medium.

Periodic Wave

- A continuous disturbance traveling through the medium.

Types of Waves



Mechanical Waves

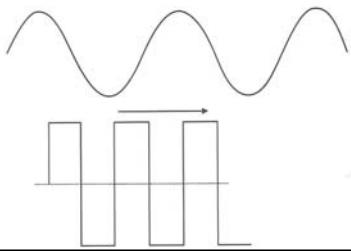
- Require a medium
 - Water
 - Sound

Electromagnetic Waves

- Can travel in a vacuum (no medium is required)
 - Light
 - Radio and TV signals

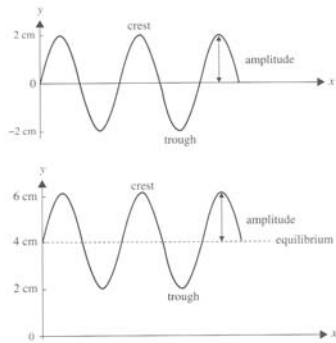
Transverse Waves

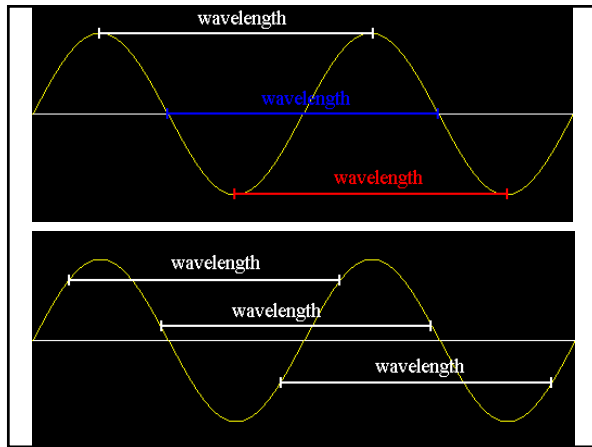
- The particles move perpendicular to the wave motion.



<http://www.schulphysik.de/suren/Applets/Waves/Twave01/Twave01Applet.html>
<https://ngsir.netfirms.com/englishhtm/TwaveA.htm>
<http://surendranath.tripod.com/Applets/Waves/TWave01/TW01.html>

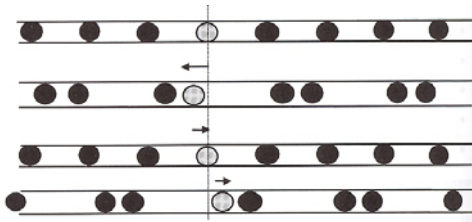
Characteristics





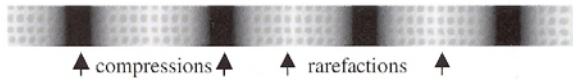
Longitudinal Waves

- The particles move parallel to the wave motion.



<http://www.schulphysik.de/suren/Applets/Waves/L.wave01/L.wave01Applet.html>

Characteristics



Period and Frequency

- Period, T
 - The time needed to produce one full wave.
- Frequency, f
 - The number of waves passing a given point per second
 - Units: Hertz, Hz

$$T = \frac{1}{f}$$

Speed of a Wave

$$v = \frac{\Delta d}{\Delta t} \quad \begin{array}{l} \Delta d = \lambda \quad (\text{wavelength}) \\ \Delta t = T(\text{period}) \end{array}$$

$$v = \frac{\lambda}{T} \quad f = \frac{1}{T}$$

$$v = f\lambda$$
