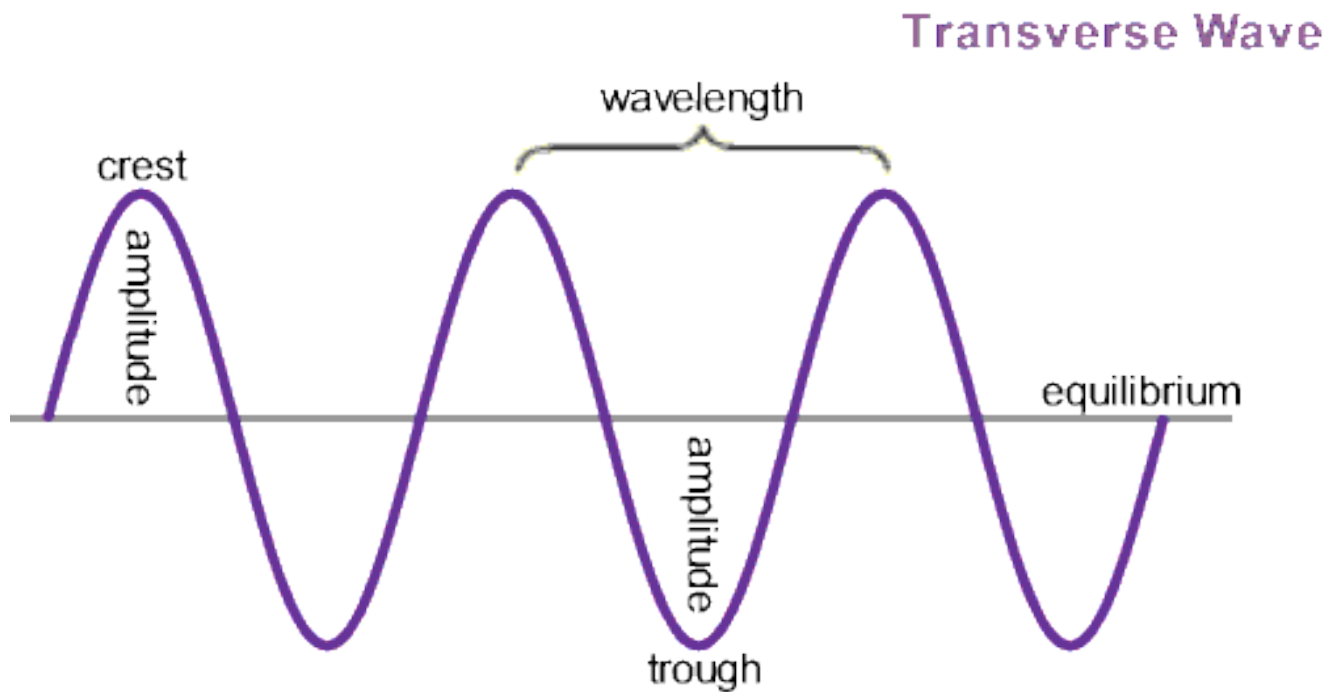


Mechanical Waves

Objects in SHM oscillate with a specific period. An oscillation that appears to *propagate* (or travel forward) is a wave.



Mechanical waves need a medium to travel through.

All waves transfer energy from one location to another. However, the medium of a mechanical wave does not get transferred. It simply oscillates/vibrates.

The oscillations in transverse waves move perpendicular to the forward motion of the wave.

The oscillations in longitudinal waves move parallel to the forward motion of the wave.

Frequency

A measurement of how many wavelengths pass through a given location in a second.

Units

$$\text{Hz} \rightarrow (1/s)$$

Period

A measurement of how much time it takes for a single wavelength to pass through a given location.

Units

$$(s)$$

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

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

Wave speed

$$v = \frac{d}{t}$$

$$v = \frac{\lambda}{T}$$

$$d = \text{wavelength} \\ = \lambda$$

$$t = \text{period} \\ = T$$

$$\boxed{v = \lambda f}$$