

## Wave Properties

**Wave** - Disturbance or oscillation (of a physical quantity), that travels through matter or space, accompanied by a transfer of energy.

Two main types of waves:

1) \_\_\_\_\_ travel as a deformation through a *medium*

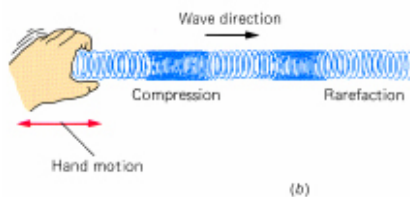
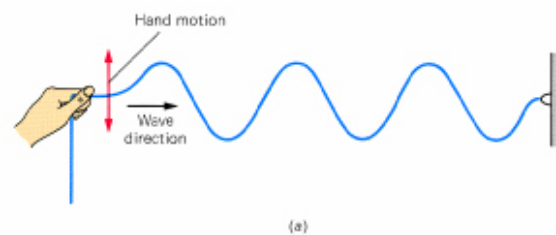
Examples:

2) \_\_\_\_\_ Periodic oscillations of electric and magnetic fields generated by charged particles

-Do not require a *medium*

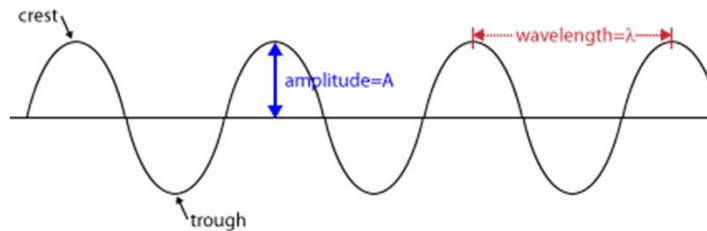
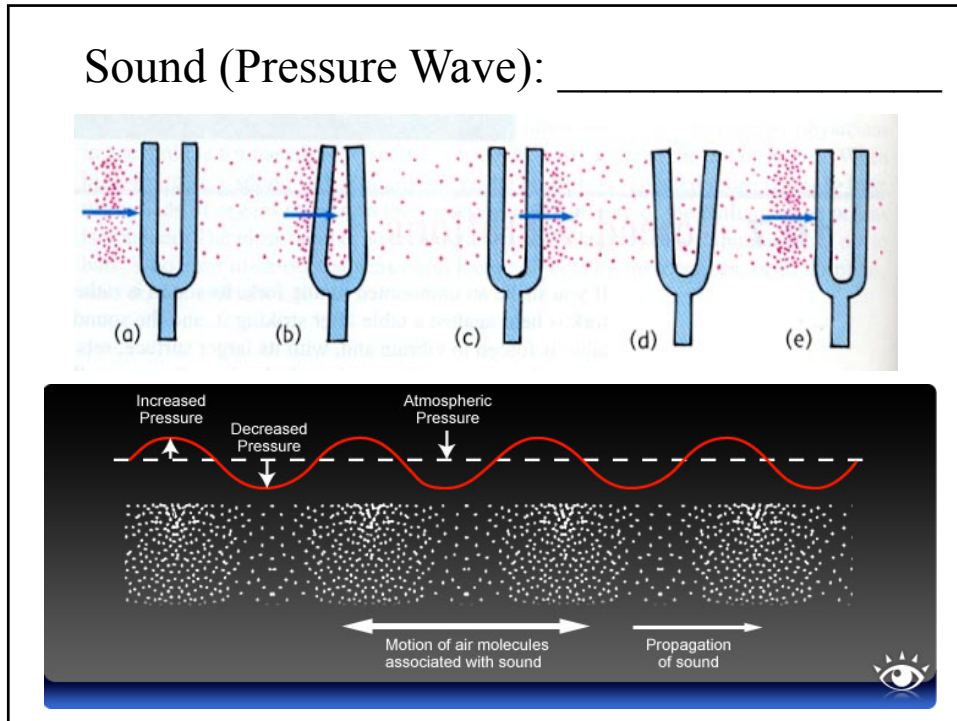
Examples:

\_\_\_\_\_ Oscillations occur perpendicular to the direction of the wave's motion



\_\_\_\_\_ Oscillations occur parallel to the direction of the wave's motion

## Sound (Pressure Wave): \_\_\_\_\_



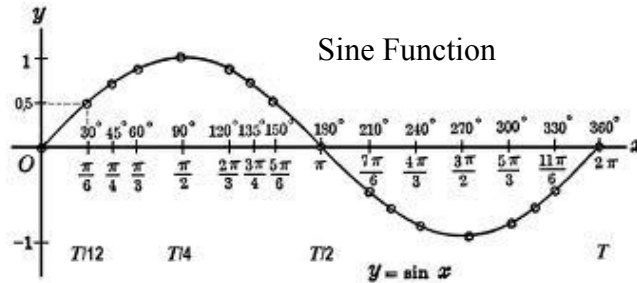
\_\_\_\_\_ The distance over which the wave's distance repeats, e.g. crest to crest, trough to trough, ...

\_\_\_\_\_ The maximum extent of an oscillation measured from equilibrium.

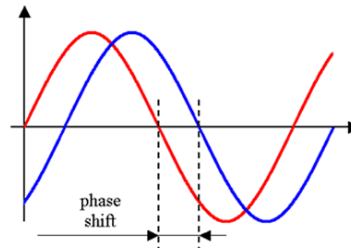
\_\_\_\_\_ Time required for one full wavelength to travel past a give point in space (\_\_\_\_\_).

\_\_\_\_\_ Number of full wavelengths that pass a given point in space each second (\_\_\_\_\_).

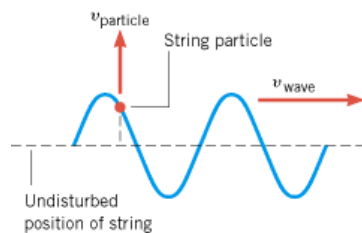
# Trigonometry



Conversion:  $2\pi$  radians =  $360^\circ$



**Wave Speed** – Distance traveled by a fixed point in a given interval of time.



$$v_{\text{wave}} = f\lambda$$

## SI Units

Wavelength:  $[\lambda] = \text{m}$  (meters)

Frequency:  $[f] = 1/\text{s} = \text{s}^{-1} = \text{Hz}$  (Hertz)

Period:  $[T] = \text{s}$

Amplitude:  $[A] = \text{m}$

Speed:  $[v_{\text{wave}}] = \text{m/s}$

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

## Wave Interference



**Destructive**



+



=



**Constructive**



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