Waves Notes

*Waves carry Energy

Speed of a wave → Determined by the medium of the wave

① speed = distance / time

$$v = d/t$$

Ex. A wave pulse travels 15 m in 3 s. How fast is it traveling?

$$v = \frac{d}{t} = \frac{(15\text{m})}{3\text{s}} = 5\ \text{m/s}$$

② speed = wavelength × frequency

$$v = \lambda f$$

Ex. What is the speed of a wave 12 m long and a frequency of 9 Hz.

$$v = \lambda f = (12\text{m})(9\text{Hz}) = 108\ \text{m/s}$$

③ speed = wavelength divided by period

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

Ex. It takes 12 s for one 48 m long wave to pass a point. How fast is the wave moving?

$$v = \frac{\lambda}{T} = \frac{48\text{m}}{12\text{s}} = 4\ \text{m/s}$$

Period and Frequency

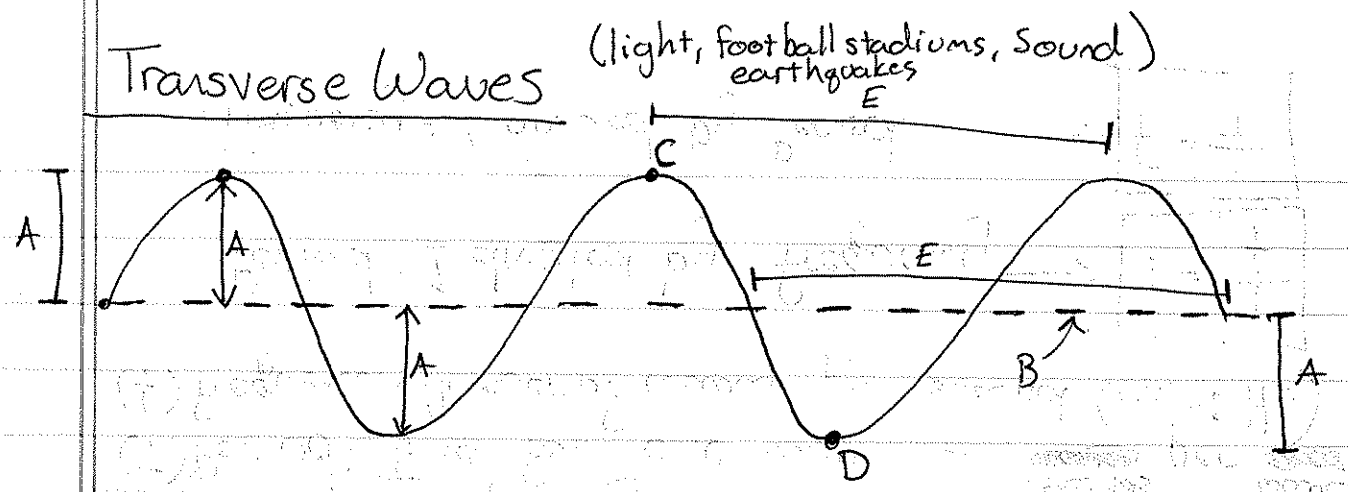
(T) Period: Time for one wave or # seconds per wave

(f) frequency: Number of waves per second (unit: Hz)

Period = 1 divided by frequency → $T = \frac{1}{f}$

Frequency = 1 divided by Period → $f = \frac{1}{T}$

Transverse Waves (light, football stadiums, Sound earthquakes)



A: Amplitude = height of wave

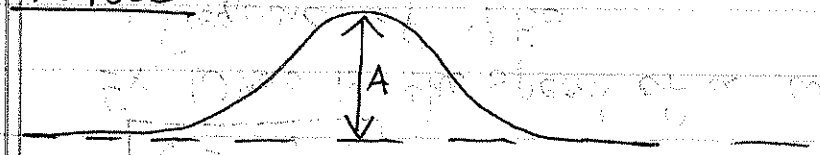
B: Equilibrium Position = where the stuff that's waving would be if there was no wave.

C: Crest or Peak = highest part of a wave

D: Valley or trough = lowest Part of a wave

E: (λ) wavelength = Distance from one part of one wave to THE SAME PART on the NEXT Wave

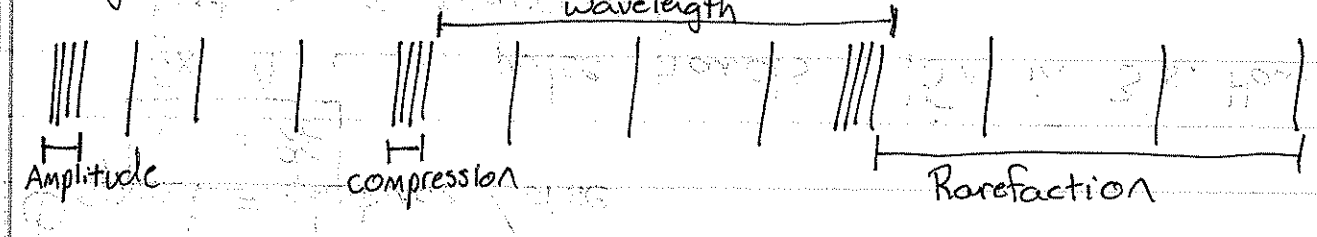
Pulses



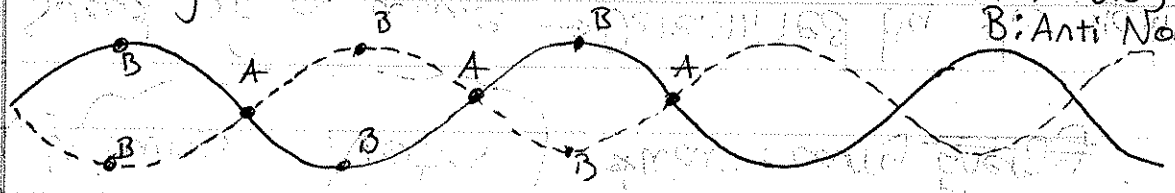
A) Amplitude

B) $v = d/t$ (speed)

Longitudinal waves - Sound, slinkies



Standing Waves



A: Nodes

B: Anti Nodes