

Lesson 2 Properties of Waves

All waves have 4 common properties: amplitude, wavelength, frequency and speed.

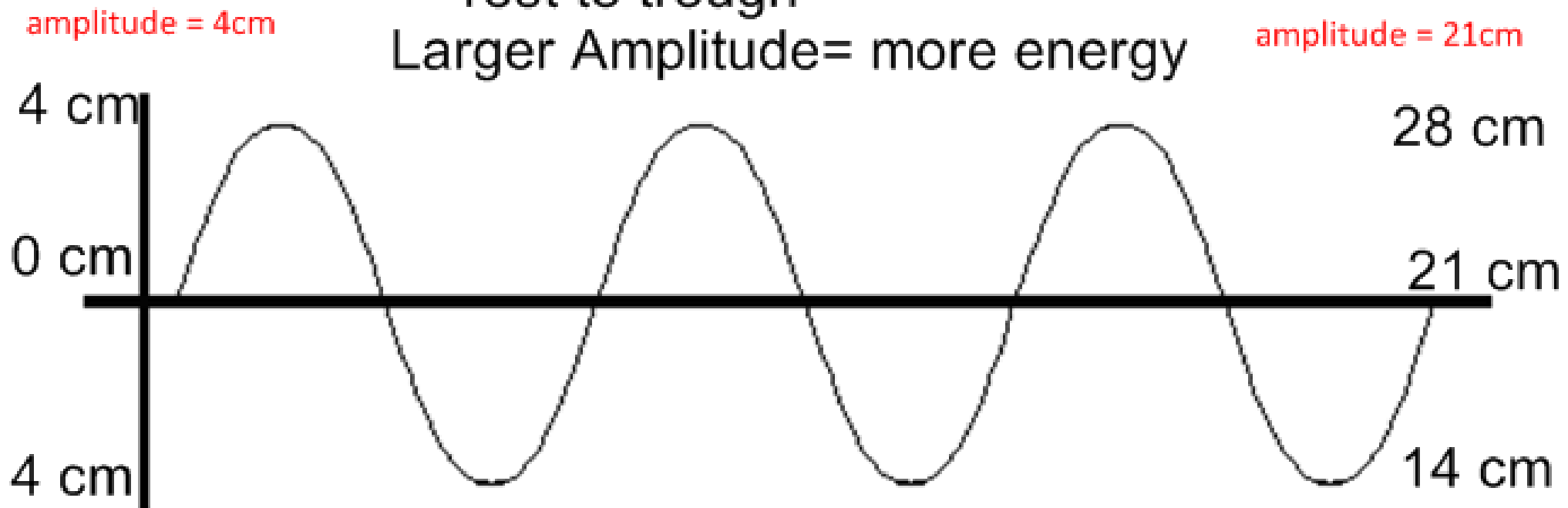
Amplitude - is the height of a wave. It is the maximum distance the medium vibrates from the rest position.

Measured from : rest to crest

or

rest to trough

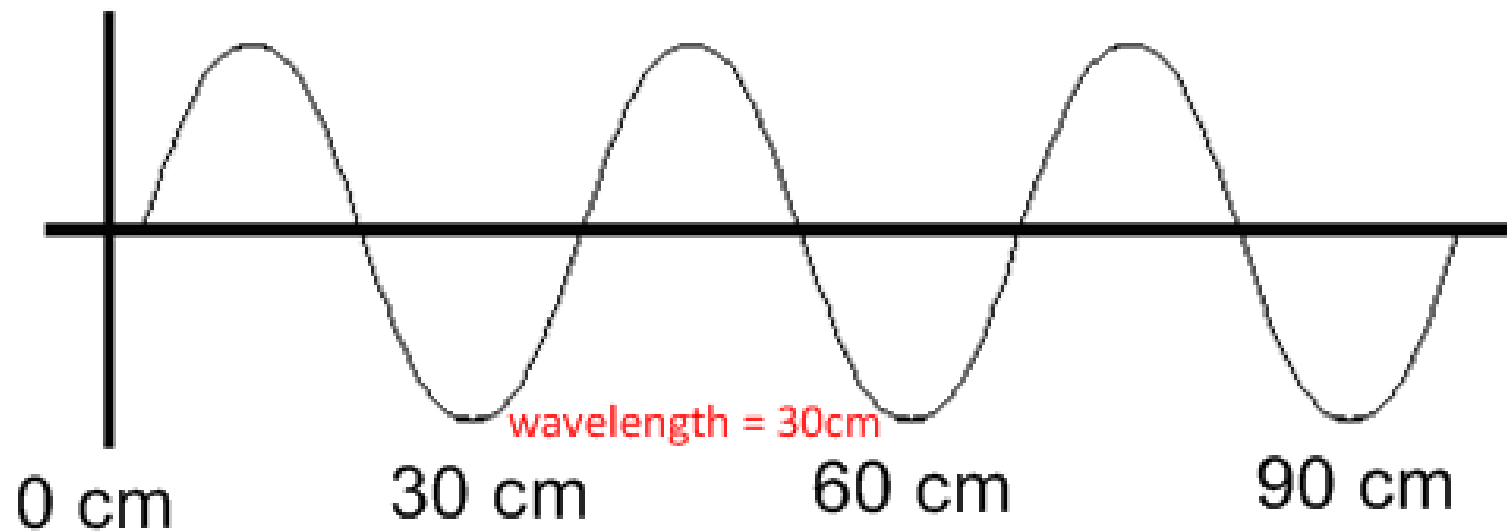
Larger Amplitude = more energy



Wavelength - is the distance between one point on a wave to the identical point on the next wave.

Measured from - crest to crest
trough to trough
compression to compression

Shorter wavelength = more energy



Frequency - the number of waves that pass a given point in a certain amount of time.

frequency is measured in units called hertz (Hz)

A wave that occurs every second has a frequency of 1 wave per second (1/s) or 1Hz

3 waves that occurs every second has a frequency of 3 waves per second 3/s or 3Hz

Speed - is how far the wave travels in a given amount of time.

Speed is found by dividing the distance it travels by the time it takes to travel that distance. $\text{Speed} = \frac{\text{distance}}{\text{time}}$

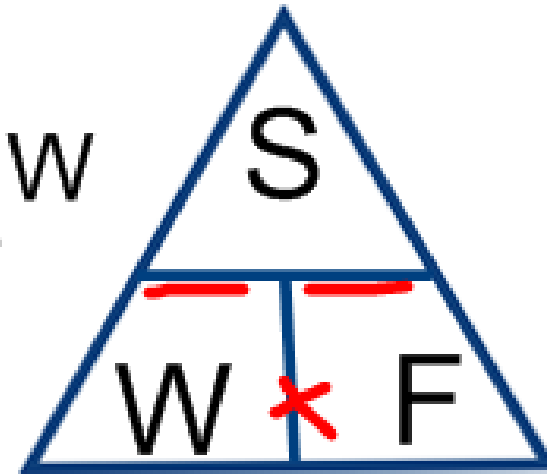
Sound travels 990 meters in 3 seconds its speed can be found by dividing 990m by 3s which = $\frac{990\text{m}}{3\text{s}}$

How are frequency, wavelength, and speed related?

Speed = S

Wavelength = W

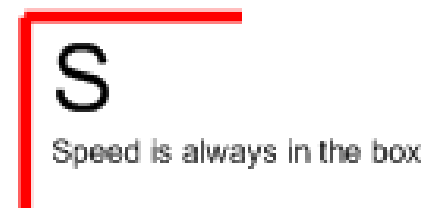
Frequency = F

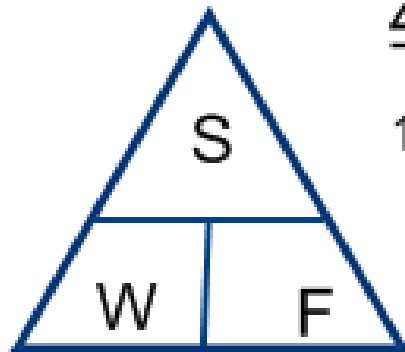


Speed = wavelength X frequency

Frequency = speed
wavelength

Wavelength = speed
frequency





4 Steps to solve for Speed, Wavelength, and Frequency

1. Write out equation: (What are they asking you to solve for?)
 $S = W \times F$ (Look at problem to decide)

$$W = \frac{S}{F}$$

$$F = \frac{S}{W}$$

2. Plug in your numbers with units
3. Do the math
4. Write the answer with units

Units

$$S = \text{cm/s} \quad \text{m/s} \quad \text{km/s} \quad \text{mm/s}$$

$$W = \text{cm} \quad \text{m} \quad \text{km} \quad \text{mm}$$

$$F = \text{Hz} - (\text{frequency is always Hz})$$