Physics chapter 6 waves

What is a wave

A wave is something

- that transfer energy
- does not transfer matter

Example

- you drop a twig in a water
- ripples move out and energy moves
- but the water itself does not move away

- Same with sound
- sound Travels but air does not leave the room

Waves transfer energy by making particles move

Particles in a wave

shake vibrate and oscillate

But they stay in same place

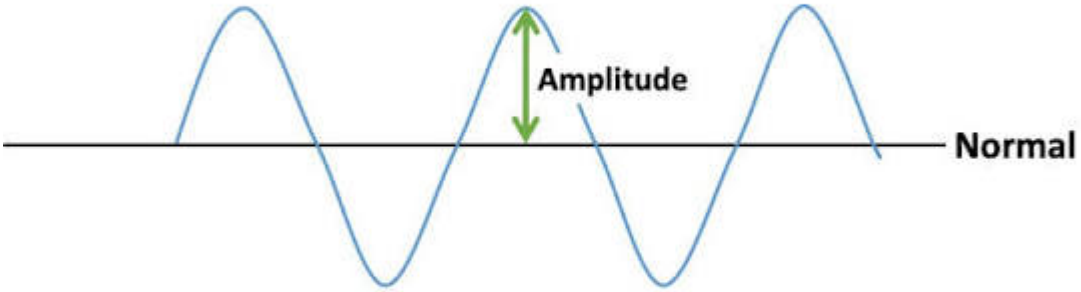
only energy goes forward

Parts of a wave

Amplitude

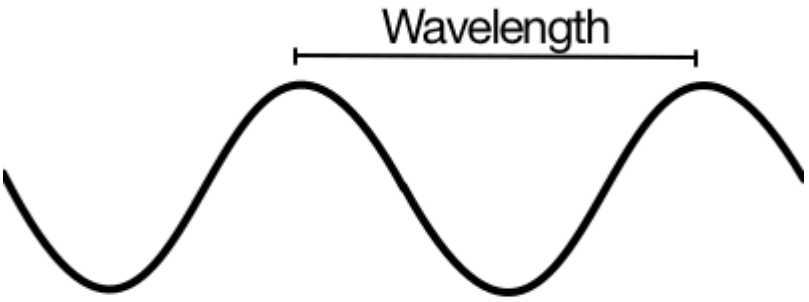
How high the wave goes from its rest position is called amplitude

maximum height



Wavelength

- the distance between same point on the two waves is called wavelength
- crest to next crest
- trough to next trough



Frequency

how many complete waves pass a point each second

It is measured in hertz
one hz will be equal to one wave per second

Time Period

Time for one full wave to pass

$T = 1 / f$

Where f is frequency

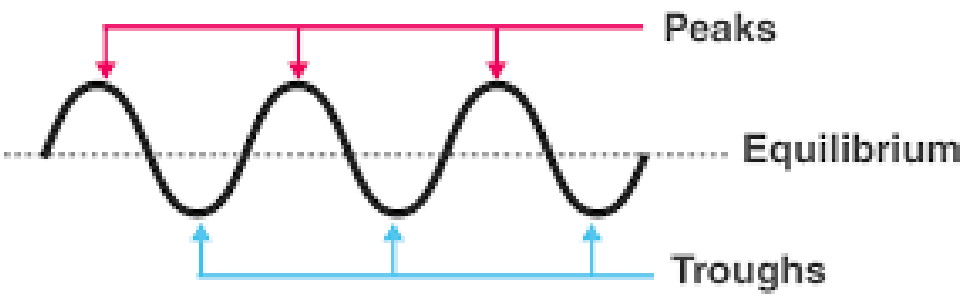
Transverse and longitudinal waves

Vibrations are perpendicular to the direction the wave travels

Imagine a snake moving sideways while going forward

Examples

- all electromagnetic waves such as light radio X-rays
- water ripples
- waves on a rope
- Waves on guitar



Longitudinal waves

vibrations are parallel to the direction wave travels

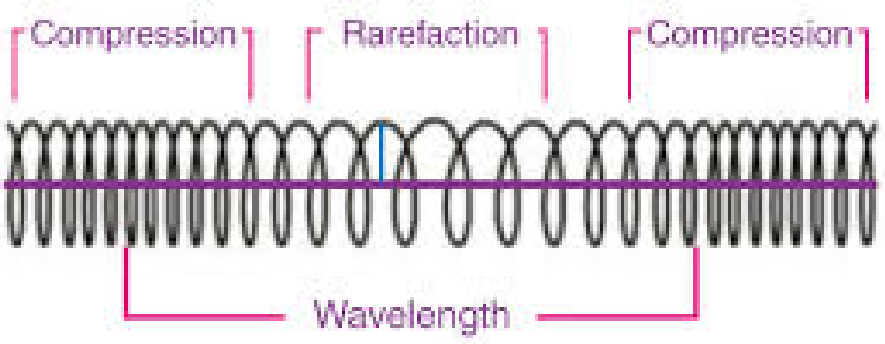
These waves have

Compressions, particles close together

rare factions, particles spread apart

Examples

- **sound waves**
- **ultrasound waves**
- **shock waves**



Wave speed equation

V = f lambda

$$V = f \times \lambda$$

WAVE SPEED = FREQUENCY X WAVELENGTH

(m/s) (Hz) (m)

Example

a radio wave has to frequency of 12 Hertz

speed is 3.010 what is the wavelength