2. Types of Waves
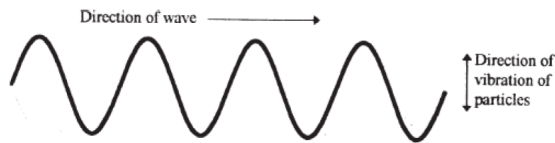
All waves transfer **energy**.

Transverse Wave
A water wave is a transverse wave.

The direction of vibration is at right angles to the direction of wave travel.

In this diagram the water particles move up and down but the wave travels from left to right.
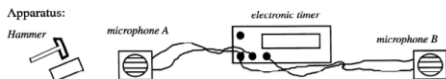

Longitudinal Wave
A sound wave is a longitudinal wave. The direction of vibration is in the same direction as the travel of the wave.
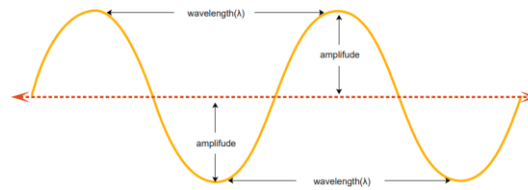

Calculating the speed of sound

A loud sound is made. As the sound reaches microphone A, the timer starts; when the sound waves reach microphone B, the timer stops. The distance between the microphones is measured with a metre stick. d=vt used to get 340ms^{-1} as speed of sound in air.

1. Wave Calculations

A typical wave diagram is shown:

It is also possible to find the speed of the wave by using the wave equation.

Frequency (f) = the number of waves that pass a point in one second.
Wavelength (λ) = horizontal distance between any two corresponding points on adjacent waves.
Amplitude = vertical distance measured from the middle of the wave to the top or to the bottom.

$$v = f\lambda$$

v = wave speed measured in ms^{-1}
f = frequency measured in Hz
λ = wavelength measured in m

SEE NEXT PAGE FOR DETAILED EXAMPLES
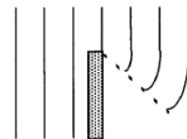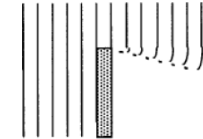
1. WAVE PARAMETERS & BEHAVIOURS

3. Diffraction
Diffraction occurs when waves pass through a gap or around an object.

Waves which have a longer wavelength produce more diffraction than waves with a shorter wavelength.

Long wavelength diffraction

Short wavelength diffraction

Application: telecommunications it is easier to receive a longer wavelength radio wave behind a hill than a shorter wavelength TV wave. The house in the following diagram would have a good quality radio signal but a poor quality TV signal from the transmitter.