

Unit 8 – Waves

Energy transfer can occur by:

1. Conduction – transfer of energy by contact between objects (from atom to atom or molecule to molecule).
2. Convection – transfer of energy through movement of a liquid or a gas (via currents).
3. Radiation – transfer of energy through electromagnetic waves.

Wave – a transfer of energy in the form of a disturbance through a medium (material or space).

Waves transfer energy but not matter. All waves require a source of energy.

Waves can be classified into two categories:

1. Electromagnetic waves – waves which do not require a material medium (ie. they can travel through space).
2. Mechanical waves – waves which do require a material medium.

Which type of wave are the following:

water:

radio:

light:

wave in a rope:

infrared:

UV:

sound:

wave in a spring:

x-rays:

gamma rays:

Summary:

Both categories of waves require a source of energy to create the disturbance, but only mechanical waves require a material medium to transfer the energy.

A source of energy will produce a wave pulse.

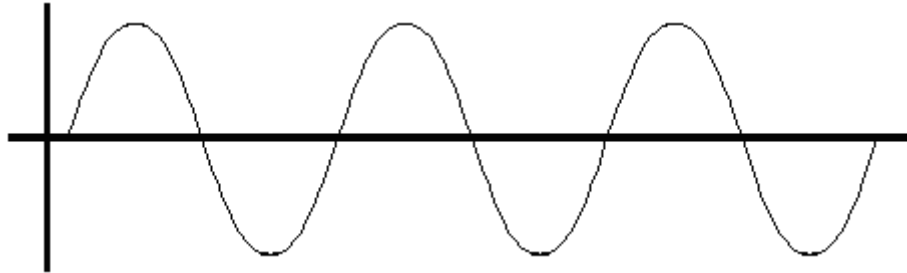
Pulse – a single wave disturbance.

If the source of energy periodically produces pulses, a continuous wave is formed.

Continuous wave:

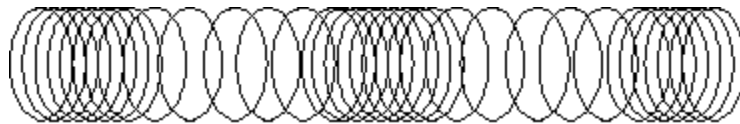
Types of Mechanical waves (require a material medium):

1. Transverse waves – displacement of the medium is perpendicular to the direction the wave is moving.



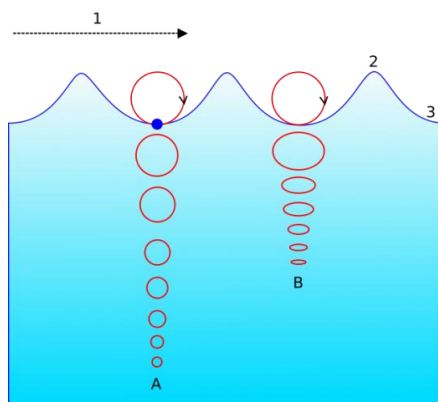
ex. waves in piano and guitar strings

2. Longitudinal (Compressional) waves – displacement of the medium is parallel to the direction the wave is moving.



ex. waves in deep water, sound waves

3. Surface waves – combination of transverse and longitudinal waves.



ex. waves at surface of a liquid

