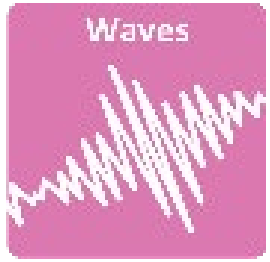
Knowledge organiser



Y7 topic: Waves intro

I have already learned:
In KS2: You have already learnt about how light and sound waves interact with different objects and how these waves allow us to see and hear.

This topic links to:
KS3: Y7 Light, Y8 Sound, Y8 Thermal energy
KS4: P6 Waves

It is important to study about waves because…
Waves transfer energy and carry information. Light waves allow living organisms to see. Sound waves allow living organisms to hear things from far away. Waves are used to heat things up, detect broken bones, transmit radio and television broadcasts, send superfast fibre-optic broadband and detect counterfeit money… amongst many other uses.

Possible careers involving waves are…
- Seismologist
- Optician
- Telecommunications engineer
- Physical oceanographer
- Radiographer

KNOWLEDGE ORGANISER
BIG IDEA: WAVES
TOPIC: Y7 - Waves intro

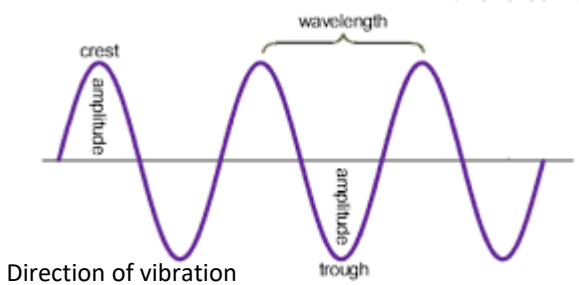
Key Terms

Term	Definition
waves	Vibrations that transport energy from place to place without transporting matter.
transverse waves	Where the direction of vibration is perpendicular to the direction of the energy transfer.
longitudinal waves	Where the direction of vibration is parallel to the direction of the energy transfer.
rest position	The undisturbed position of particles when they are not vibrating.
crest (peak)	The highest point above the rest position.
trough	The lowest point below the rest position.
amplitude	The distance from the rest position to the crest or trough.
wavelength	The distance from one point of one wave to the same point on the next wave. Usually measured from crest to crest or trough to trough. Wavelength is measured in metres (m)
frequency	The number of waves passing a point each second. Frequency is measured in hertz (Hz)
perpendicular	Lines that form an angle of 90° when they meet.
parallel	Lines that do not meet.

Equations

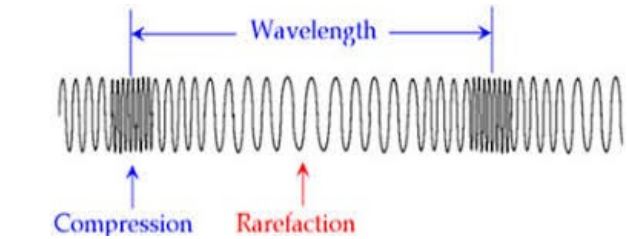
Key Word	Definition	Equation
Wave speed (m/s)	The distance a wave travels every second	Wave speed = frequency x wavelength **v = f x λ**
Frequency (Hz)	The number of waves passing a point each second	Frequency = number of waves ÷ time **f = number of waves / t**

Transverse Waves e.g. Light

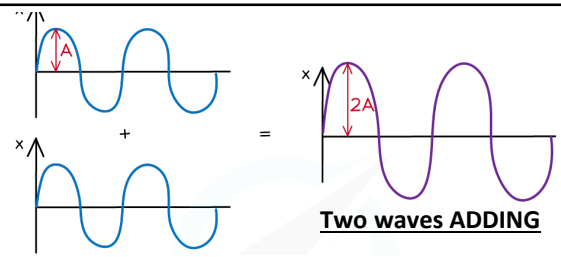


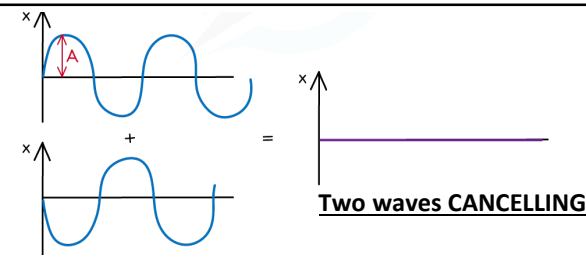
For a transverse wave the direction of vibration is perpendicular to the direction of energy transfer.

Longitudinal Waves e.g. Sound



For a longitudinal wave the direction of vibration is parallel to the direction of energy transfer.





Superposition occurs when two waves meet at the same point. If the "sign" of the wave is the same for both waves, the amplitudes of the waves ADD to make a single wave with a bigger amplitude. If the "sign" of the wave is the opposite for the two waves, the amplitudes of the two waves CANCEL to make a single wave with a smaller amplitude – you can even get complete cancellation.