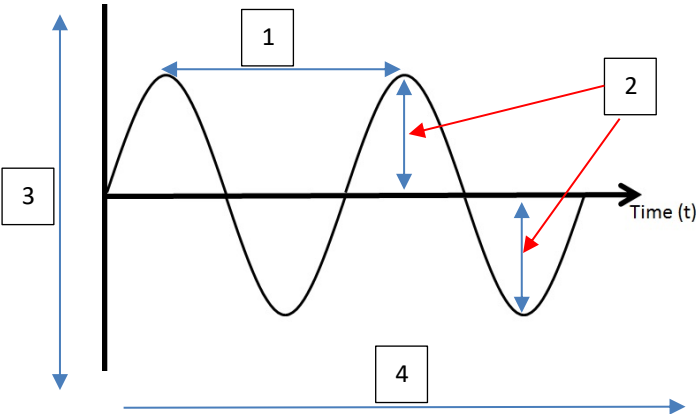


1. Key Words

Transverse wave	A wave where the vibrations are perpendicular to the direction of travel
Longitudinal wave	A wave where the vibrations are parallel to the direction of travel
Frequency	Number of waves passing a point in 1 second (measured in hertz – HZ)
Period	Time for one complete wave
Reflection	When waves bounce off a surface
Refraction	When waves travel through materials of different densities and the frequency of the wave changes

2. Transverse waves

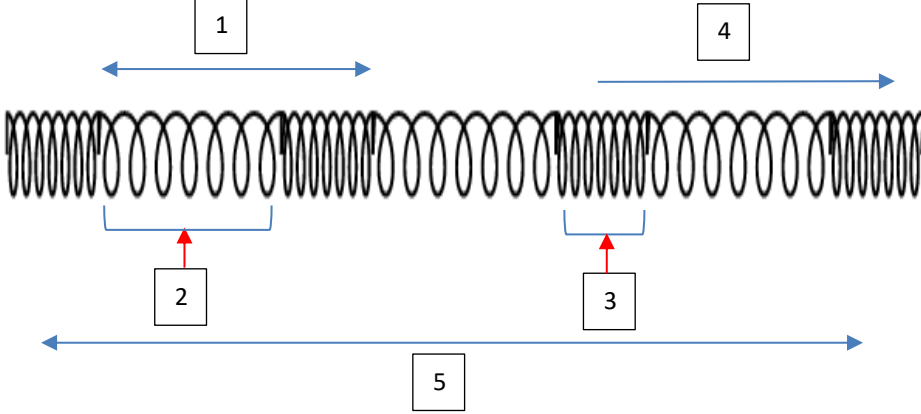
1	Wavelength
2	Amplitude
3	Direction of vibration
4	Direction of travel



Examples	Light, water waves, electromagnetic waves, s-waves
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3. Longitudinal waves

1	Wavelength
2	Rarefaction
3	Compression
4	Direction of vibration
5	Direction of travel



Examples	Sound, p waves, water waves
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4. Wave Equations

Wave speed (m/s) = frequency (Hz) x wavelength (m)

$$v = f\lambda$$

$$\text{Period (s)} = \frac{1}{\text{frequency (Hz)}}$$

5. Electromagnetic waves

Name	Wavelength	Uses	Dangers
Radio wave	1 m – 10 ⁴ m	Communication e.g. Bluetooth, TV and FM radio	Low risk as the waves pass easily through soft tissue
Microwave	10 ⁻² m	Communications e.g. mobile phones and satellite TV Heating objects	Increased risk of tissue damage in localised areas
Infra-red	10 ⁻⁵ m	Infra-red cameras and electric heaters	Burns
Visible	10 ⁻⁷ m	Fibre optic cables	Damage to the retina
Ultra-violet	10 ⁻⁸ m	Fluorescent lights, security pens and sunbeds	Sunburns, premature aging of the skin, blindness and cancer
X-ray	10 ⁻¹⁰ m	Radiography (CT scans and x-rays) and treating cancer	Cancer
Gamma	10 ⁻¹⁵ m	Treating cancer and sterilising medical equipment	Cancer and radiation poisoning

6. Infra-red radiation

All objects emit and absorb infra-red radiation

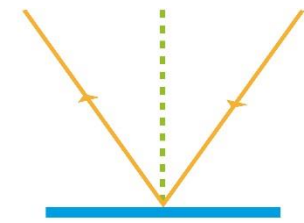
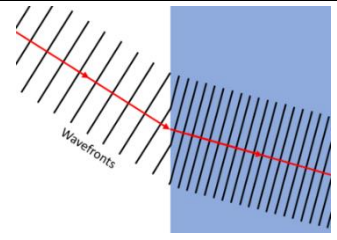
Objects **HOTTER** than their surroundings emit more IR radiation than they absorb

Objects **COOLER** than their surroundings emit less IR radiation than they absorb

Dark colours absorb and emit more IR radiation than white

Matt surfaces absorb and emit more IR radiation than shiny ones

7. Wave behaviour in materials

Reflection	
Refraction	
Diffraction	