

The Berwickshire High School

S1 Physics

Waves Knowledge Organiser

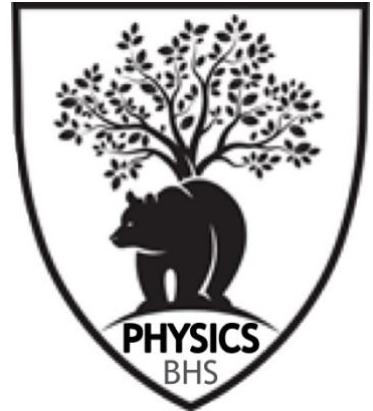


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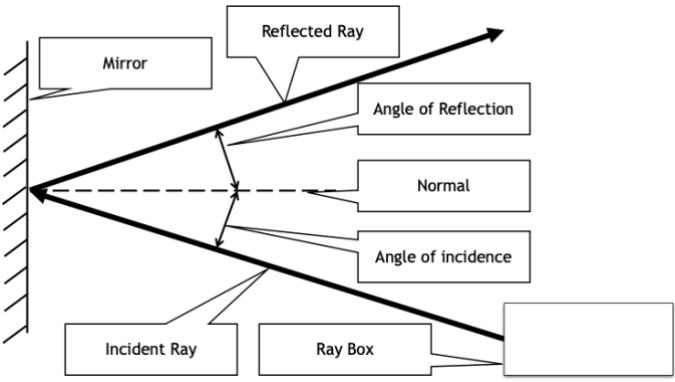
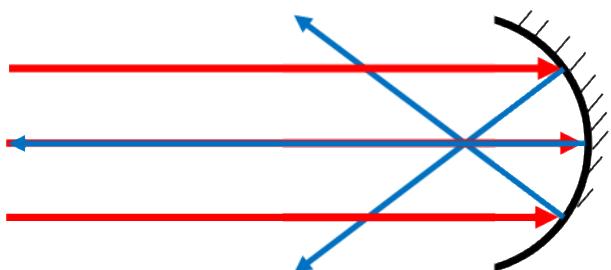
WAVES

Wave	A way of moving energy from one place to another without moving the material.
Transverse Wave	The particles move up and down while the energy moves side to side . Examples: light, water .
Longitudinal Wave	The particles move back and forward in the same direction as the energy. Example: sound .
Amplitude	The height of a wave from its middle to the top (crest) or bottom (trough).
Wavelength (λ)	The distance between two matching points on a wave (e.g. crest to crest).
Crest / Trough	Highest and lowest points of a transverse wave.

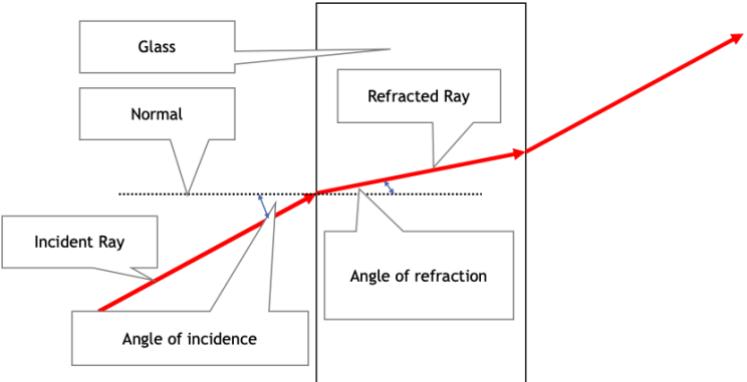
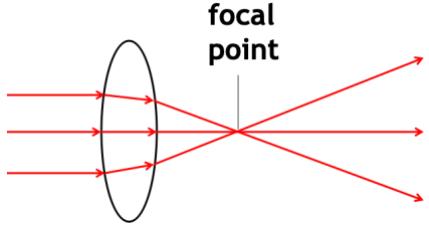
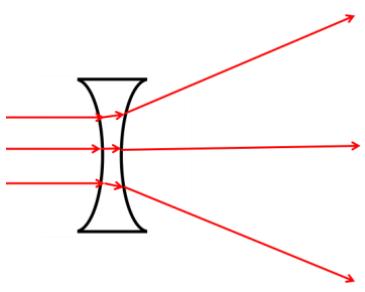
LIGHT

Light	A type of energy that travels in straight lines . Speed = 300,000,000 m/s.
Luminous Object	Gives out its own light (e.g. the Sun, a bulb).
Non-Luminous Object	Seen by reflected light (e.g. the Moon, a book).
Seeing Things	We see objects when light reflects from them into our eyes.

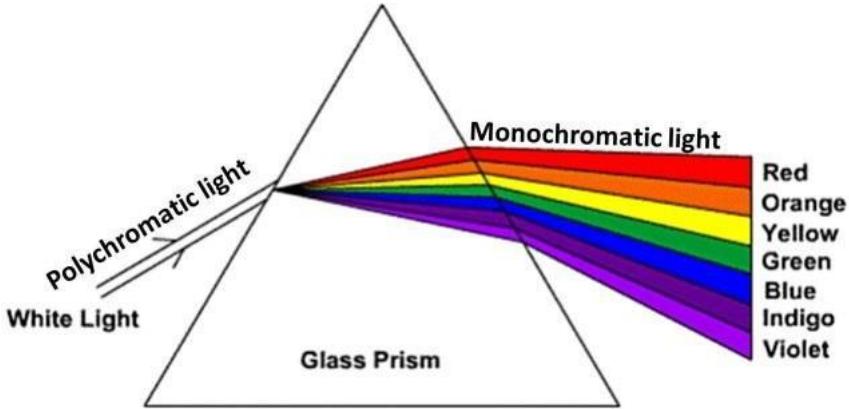
REFLECTION

Law of Reflection	The angle of incidence = angle of reflection.
	
Normal	A dashed line at 90° to the mirror surface.
Incident Ray	The ray of light that hits the mirror.
Reflected Ray	The ray of light that bounces off the mirror.
Curved Reflector	Reflects all rays to the focal point , where the energy is strongest.
	
Focal Point	The point where reflected rays meet. Used in satellite dishes and headlights .

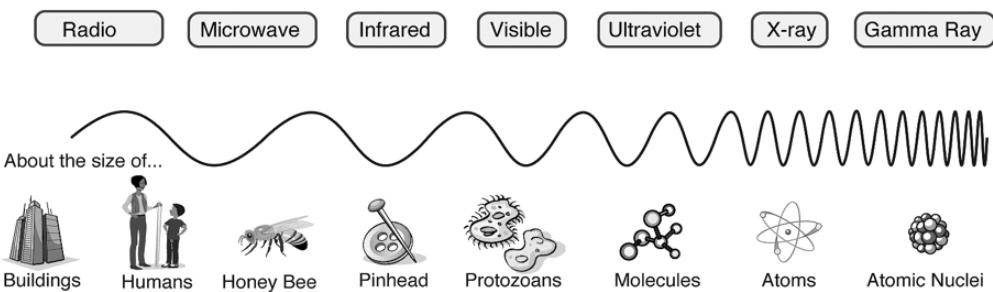
► REFRACTION AND LENSES

Refraction	When light changes speed and direction as it passes through different materials like air, water, or glass.
Angle of Refraction	The angle between the bent ray and the normal .
	
Lenses	Pieces of glass or plastic that bend light to help us see or focus images.
Convex Lens	Curves outwards and focuses light rays to a point. Used in magnifying glasses, cameras, and eyes .
	
Concave Lens	Curves inwards and spreads out light rays. Used in projectors and telescopes .
	

COLOUR AND THE SPECTRUM

Dispersion	When white light splits into different colours using a prism.
	 <p>The diagram illustrates the dispersion of light through a glass prism. A beam of 'White Light' enters the prism from the left. Inside, it is refracted into a 'Monochromatic light' spectrum, which is a continuous band of colors. The colors are labeled from top to bottom as: Red, Orange, Yellow, Green, Blue, Indigo, and Violet. The prism is labeled 'Glass Prism'.</p>
Visible Spectrum	The seven colours of light: Red, Orange, Yellow, Green, Blue, Indigo, Violet (ROYGBIV) .
Primary Colours of Light	Red, Green, Blue.
Mixing Colours	Red + Green = Yellow , Red + Blue = Magenta , Blue + Green = Cyan , All three = White .

ELECTROMAGNETIC SPECTRUM (EM SPECTRUM)

Electromagnetic Spectrum	 <p>The diagram shows the Electromagnetic Spectrum with wavelength markers. At the top, seven categories are listed: Radio, Microwave, Infrared, Visible, Ultraviolet, X-ray, and Gamma Ray. Below these, a wavy line represents the spectrum. A label 'About the size of...' is placed above the wavy line. Below the wavy line, pairs of icons illustrate the relative sizes of different objects for each wavelength region:</p> <ul style="list-style-type: none"> Buildings (Radio waves) Humans (Microwave) Honey Bee (Infrared) Pinhead (Visible) Protozoans (Ultraviolet) Molecules (X-ray) Atoms (Gamma Ray) Atomic Nuclei (Gamma Ray)
Radio Waves	Longest wavelength. Used for radio and TV signals . No known health risks.
Microwaves	Used for mobile phones and cooking . Can cause burns with high exposure.
Infrared (IR)	Felt as heat ; used in remote controls and thermal cameras . Can cause skin burns .
Visible Light	What our eyes can see. Used for sight and photography . Very safe in normal amounts.
Ultraviolet (UV)	Used in forensics and sterilising equipment . Can cause sunburn or skin cancer .
X-rays	Used in medical imaging . High doses can damage cells .
Gamma Rays	Highest energy. Used for cancer treatment and sterilisation . Can kill living cells .

SOUND

Sound	A longitudinal wave made by vibrations. Cannot travel in space.
Speed of Sound	340 m/s in air. Speed = distance ÷ time.
Volume	How loud a sound is; measured in decibels (dB) .
Pitch	How high or low a sound is; depends on how fast it vibrates (frequency).
High Pitch	Many waves per second (short wavelength).
Low Pitch	Fewer waves per second (long wavelength).
Loud Sound	Large amplitude.
Quiet Sound	Small amplitude.