Definitions and Concepts for AQA Physics GCSE

Topic 6: Waves

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Amplitude: The maximum displacement of a wave from its undisturbed (equilibrium) position.

Angle of Incidence: The angle between the incident ray and normal.

Angle of Reflection: The angle between the reflected ray and normal.

Black: An object will appear black if it absorbs all wavelengths of radiation incident on it.

Colour Filters: Filters that absorb certain wavelengths (colours) and transmit others. A blue filter for example will absorb all wavelengths other than those in the blue region of the colour spectrum.

Colour: Colour is determined by frequency and wavelength.

***Constant Temperature: A body remains at a constant temperature if it is absorbing radiation at the same rate that it is emitting it.**

Convex Lens: A lens that brings parallel rays to focus at the principal focus.The image formed can be either real or virtual.

Diffuse Reflection: Reflection from a rough surface that results in scattering.

***Echo Sounding: A technique that uses high frequency sound waves to detect objects in deep water and to measure the depth of water.**

Electromagnetic Waves: Transverse waves that transfer energy from the source of the waves, to an absorber. They form a continuous spectrum of different frequencies and all travel at the same speed in a vacuum.

Focal Length: The distance between the centre of a lens and its principal focus.

Frequency: The number of waves passing a given point in a second. It is the inverse of the wave's period.

Hertz: The unit of frequency.

***Human Hearing: Humans can hear sounds in the frequency range of 20Hz to 20kHz.**

Infrared Radiation: A type of radiation that all objects emit and absorb. The hotter an object is, the greater the infrared radiation it emits in a given time.

Infrared: Used for cooking food, electrical heaters and infrared imaging.

Ionising Radiation: Radiation that can cause the mutation of genes and cause cancer. X-rays and gamma rays are both forms of ionising radiation.

Lens: An object that forms an image through the refraction of light.

Longitudinal Waves: Waves with oscillations that are parallel to the direction of travel/energy transfer.

Magnification: The ratio of the image height over the object height for a lens. Since it is a ratio, it has no units.

Microwaves: Used for satellite communications and for cooking food.

Normal: The normal is an imaginary reference line that is constructed perpendicular to a boundary at the point that the wave intercepts it.

***P-Waves: Longitudinal, seismic waves that travel at different speeds through solids and liquids.**

***Perfect Black Body:** An object that absorbs all radiation incident on it and does not reflect or transmit any type of radiation.

Period: The time it takes for one complete wave to pass a given point. It is the inverse of frequency.

Radiation Dose: A measure of the risk of harm to the body as a result of radiation exposure.

Radio Waves: Used for television and radio signals. They can be produced by oscillations in electrical circuits.

***Reflection:** Reflection is when a wave bounces off a boundary. The angle of incidence always equals the angle of reflection.

***S-Waves: Transverse, seismic waves that cannot travel through liquids.**

***Seismic Waves: Waves that are produced by earthquakes.**

***Sound Waves: The longitudinal waves responsible for sound. In solids, sound waves are transmitted by the vibrations of the solid's particles.**

Specular Reflection: Reflection from a smooth surface, in a single direction.

Transverse Waves: Waves with oscillations that are perpendicular to the direction of travel/energy transfer.

***Ultrasound Scanning: A technique that involves ultrasound waves being transmitted and then partially reflected at a boundary before being detected by a detector. The time between transmission and detection can be used to calculate distances, and build up an image.**

***Ultrasound Waves: Waves that have a frequency higher than the upper limit of human hearing (20kHz).**

Ultraviolet: Used in energy efficient lamps and for sun tanning.

Visible Light: The only type of electromagnetic radiation that our eyes can detect. It is used for fibre optic communications.

Wave Speed: The speed at which energy is transferred through the medium. It is equal to the product of the wave's wavelength and frequency.

Wavelength: The distance from a point on one wave to the same point on the adjacent wave (ie. peak to peak or trough to trough).

White: An object will appear white if it emits all wavelengths equally.