

Definitions and Concepts for WJEC (Eduqas) Physics GCSE

Topic 6: Light and Electromagnetic Waves

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

Definitions marked by '' are for separate sciences only*

Black Body: An ideal absorber and emitter of radiation. Objects that behave like a black body will absorb all radiation that is incident on it.

Colour: The colour of an object is determined by the frequency of light that is reflected from it. A red object will reflect red light, but absorb all other colours.

Colour Filter: A material that only allows light of a single colour (single frequency) to pass through.

Constant Temperature: Bodies at a fixed temperature radiate the same average power that they absorb.

Concave Lens: A lens that is thicker at the edges than in the centre. Parallel rays diverge when passing through.

Convex Lens: A lens that is thicker in the centre than at the edges. Parallel rays converge when passing through.

Diffuse Reflection: The reflection of a wave from a rough surface that results in the wave being scattered.

Electromagnetic Spectrum: A group of transverse waves that cover a large range of frequencies and wavelengths. The highest frequency waves in the spectrum are gamma-rays and the lowest are radio waves.

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.

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Gamma Rays: High energy radiation rays used for detecting and treating cancers, and sterilising food and medical implements. They can cause cell damage and mutations.

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, thermal imaging and short range communications. It can cause skin burns.

Law of Reflection: The angle of incidence must always equal the angle of reflection when a wave reflects.

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

Microwaves: Used for satellite communications and for cooking food. They can cause internal heating of body cells.

Power of a Lens: Equal to the reciprocal of the focal length of a lens. Concave lenses have negative powers whereas convex lenses have positive powers.

Principal Focus: The point before or after a lens where light rays appear to meet. The rays may converge or diverge away from this point.

Radio Waves: Used for television and radio signals. **They can be produced by oscillations in electrical circuits, or can induce these oscillations themselves.**

Ray Diagram: A visual representation of the path of a wave, usually around the point where it meets a boundary. Rays are usually drawn as straight lines with an arrow pointing in their direction of travel.

Real Image: An image produced by light-rays physically converging. Real images are ones that can be projected onto a screen.

Reflection: The bouncing back of a wave at a boundary.

Refraction: The changing of speed, and consequently the direction, of a wave as it changes medium. The wavelength of the wave will also change but the frequency remains constant.

Specular Reflection: The reflection of a wave from a smooth surface.

Speed of EM Waves: All electromagnetic waves travel at the same speed in a vacuum (3×10^8 m/s).



Temperature: The temperature of a body is determined by the balance of radiation that it emits and absorbs.

Ultraviolet: Used in energy efficient lamps, disinfecting water, and for sun tanning. It can cause cell and eye damage that can result in skin cancer and eye conditions.

Virtual Image: An image produced by the apparent, but not actual, divergence of light-rays. Virtual images cannot be projected onto a screen.

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

X-Rays: Used for medical imaging and security scanners. They can cause cell damage and mutations.

