WJEC (Eduqas) Physics GCSE

6.1: The Electromagnetic Spectrum

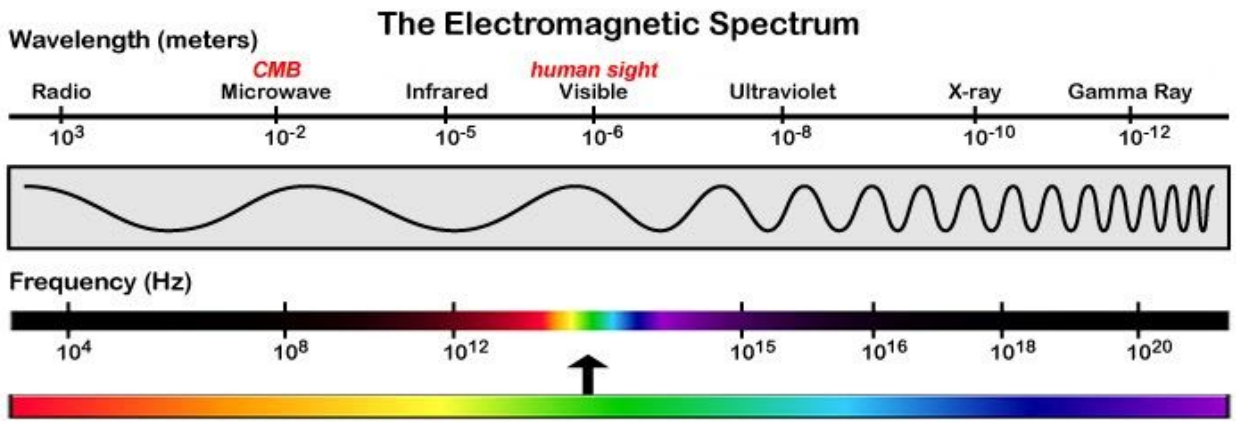
Detailed Notes

(Content in **bold** is for higher tier **only**)

Electromagnetic Waves

Electromagnetic (EM) waves are **transverse waves** due to changing magnetic and electric fields meaning they do **not** need particles to move to transfer energy. In space (a vacuum), all EM waves have the **same velocity** equal to the speed of light (**$3x10^8$ m/s**). Some EM waves can be reflected or refracted at interfaces.

EM waves have **varying frequencies** and **wavelengths** that form a **continuous spectrum**. Within this spectrum there are **seven** different categories of EM wave with distinct wavelength and frequency ranges.



Electromagnetic Spectrum showing the seven main groups of EM waves (kidstalkscience.org).

Gamma rays are the **highest energy** EM wave with a **very short** wavelength and **high** frequency.

Radio waves are the **lowest energy** EM wave with a **very long** wavelength and **low** frequency.

Visible light sits in the middle of the spectrum and runs from **violet** with a short wavelength to **red** with a longer wavelength.