9 Waves 3 – Radioactivity and The Electromagnetic Spectrum

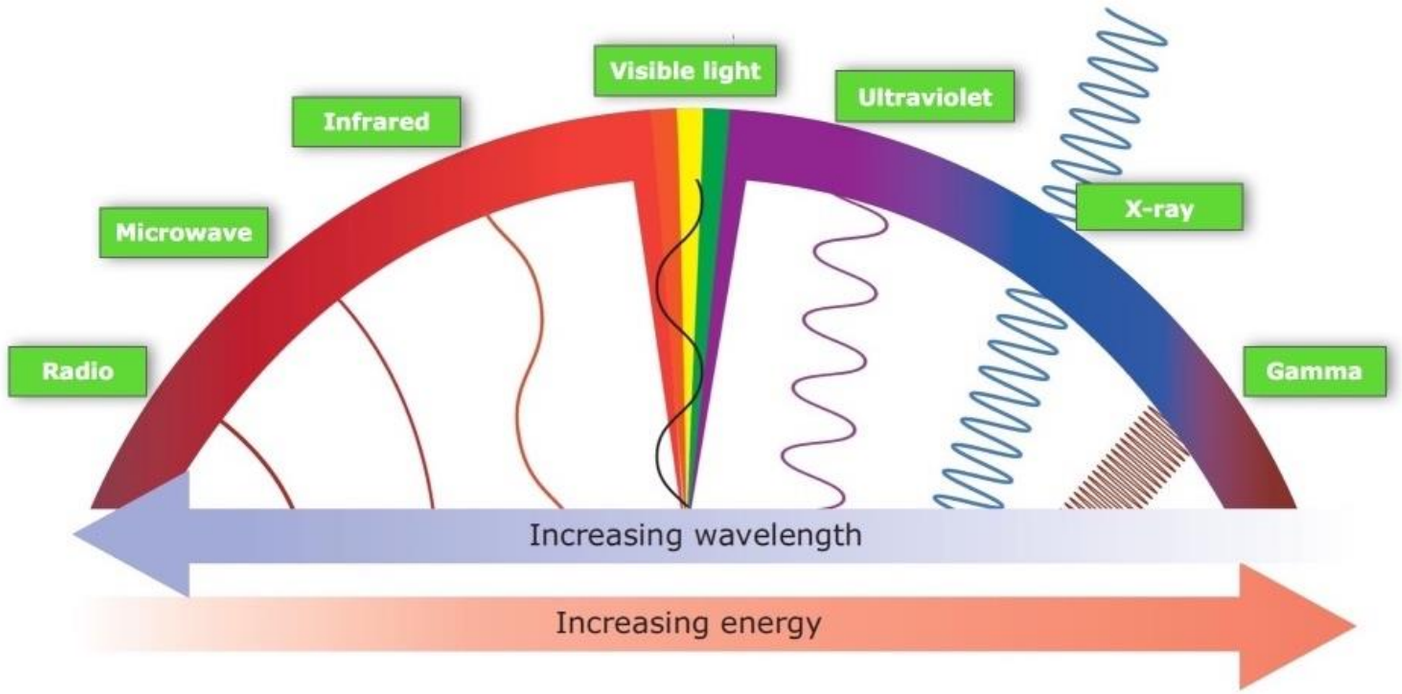
Must Remember

- EM waves are a family of waves related to light.
- They are transverse, but have an electric part and a magnetic part, so EM waves do not need a medium to travel through hence,
- EM waves travel through a vacuum at 300,000km/s.
- EM waves are emitted from various sources. They can be transmitted, reflected, or absorbed.
- The order of the EM spectrum is Radio, Microwave, Infrared, Visible light, Ultra Violet, X ray and Gamma.
- Wavelength (m) decreases as you move from Radio to Gamma.
- Frequency (Hz) increases as you move from Radio to Gamma.
- Energy (J) increases as you move from Radio to Gamma.
- They each have various uses and dangers which link to the energy of the wave.
- Some EM waves have enough energy to ionise atoms in cells and this can cause cancer.
- Ionising can also kill cells which means it can be useful for sterilisation.

Key Terms

- **Alpha Particle** - A helium nucleus emitted by some radioactive substances.
- **Beta Particle** - A fast-moving electron emitted by radioactive decay of substances.
- **Electromagnetic Spectrum** - The range of wavelengths or frequencies over which electromagnetic radiation extends.
- **Frequency** - The rate per second of a vibration constituting a wave, either in a material (as in sound waves), or in an electromagnetic field (as in radio waves and light).
- **Gamma Ray** - Penetrating electromagnetic radiation of a kind arising from the radioactive decay of atomic nuclei.
- **Half Life** - The time taken for the radioactivity of a specified isotope to fall to half its original value.
- **Ion** - An atom or molecule with a net electric charge due to the loss or gain of one or more electrons.
- **Ionization** - The process by which an atom or a molecule acquires a negative or positive charge by gaining or losing electrons.
- **Radioactivity** - The emission of ionizing radiation or particles caused by the spontaneous disintegration of atomic nuclei.
- **Transverse** - A wave in which the medium vibrates at right angles to the direction of its propagation.
- **Wavelength** - The distance between successive crests of a wave, especially points in a sound wave or electromagnetic wave.

Nice to know that...



Further Study

[BBC Bitesize – The Electromagnetic Spectrum]