The Electromagnetic Spectrum

N5

Electromagnetic Radiations

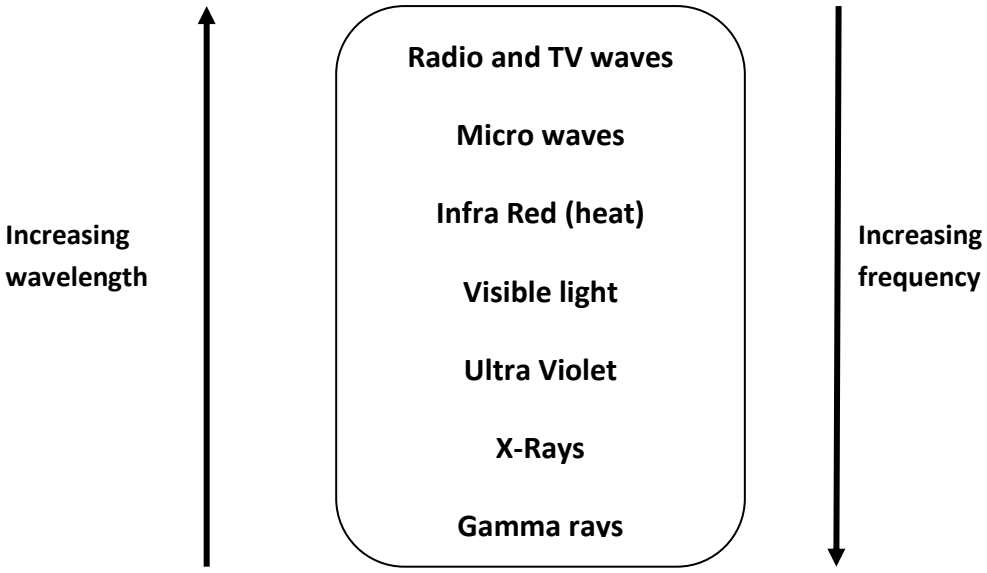
There is a group of radiations which have given astronomers a vast amount of information on the Universe. These radiations make up **The Electromagnetic Spectrum**.

Like all the notes on a piano, they are grouped in an order according to their frequency.

In unit 3 you will learn what frequency and wavelength means in Physics but all you have to know in unit 1 is the order in which these radiations fall in terms of their frequency and wavelength.

All these radiations travel at the speed of light = 300 000 000 ms^{-1}.

The 7 radiations are listed below:



How do I remember this?

Rabbits **M**ate **I**n **V**ery **U**nusual e**X**pensive **G**ardens

Can you think of your own pneumonic to remember The Electromagnetic Spectrum?

N5

Detectors of Electromagnetic Radiations

Humans can detect some of the electromagnetic radiations e.g. the eyes can detect visible light, infra red can be detected by skin and sun burn is a consequence of the skin being over exposed to ultra violet radiation from the sun.

However, energy is given out by objects in space (e.g. stars or galaxies) over the whole range of the electro-magnetic spectrum so to fully understand the universe we must collect information at all these wavelengths. Different kinds of telescope are therefore required to detect different wavelengths of radiation as one as alone cannot detect them all.

Below is a list of detectors for each radiation in the spectrum.

Radiation	Detector	Use
Radio and T.V	Aerial	Gives information on different planets e.g. distance from the Earth
Micro waves	Diode probe	The detection of Cosmic Microwave Background consolidated the belief the Big Bang occurred
Infra Red	Blackened thermometer	Infra red is used to detect objects just outside the visible spectrum
Visible Light	Photographic film	Gives information on planets and stars including temperature and size
Ultra Violet	Fluorescent paint	Used to study star formation – most “young” stars emit ultra violet radiation
X-Rays	Photographic film	Used to detect the presence of black holes
Gamma rays	Geiger-Muller tube	Used to detect the presence of black holes and supernova