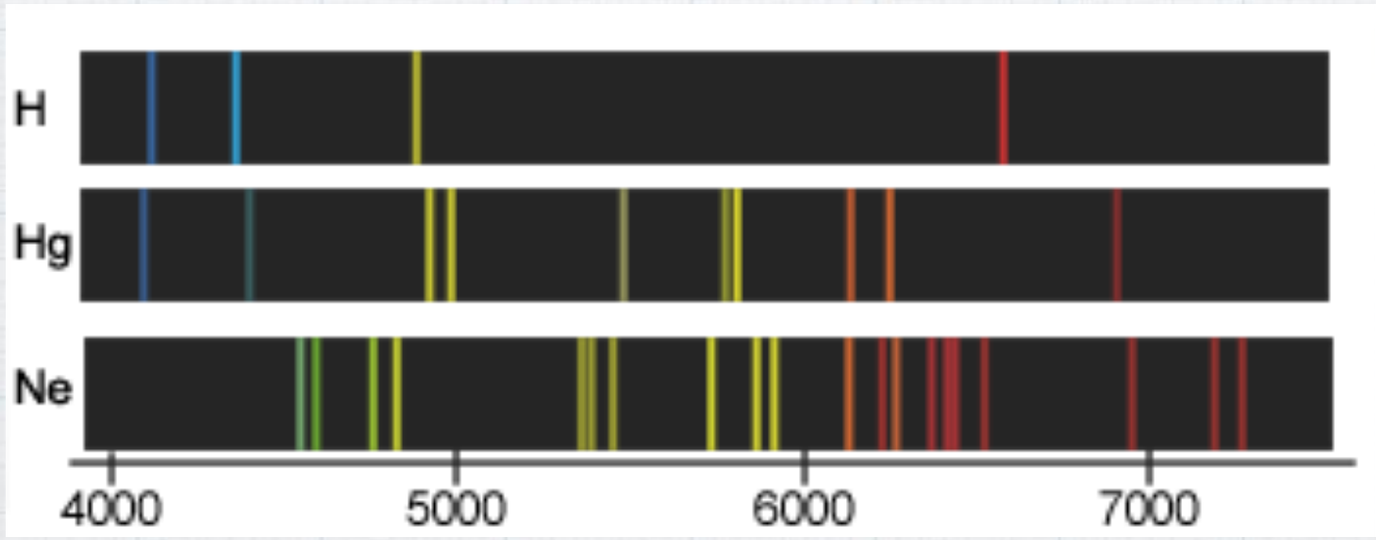
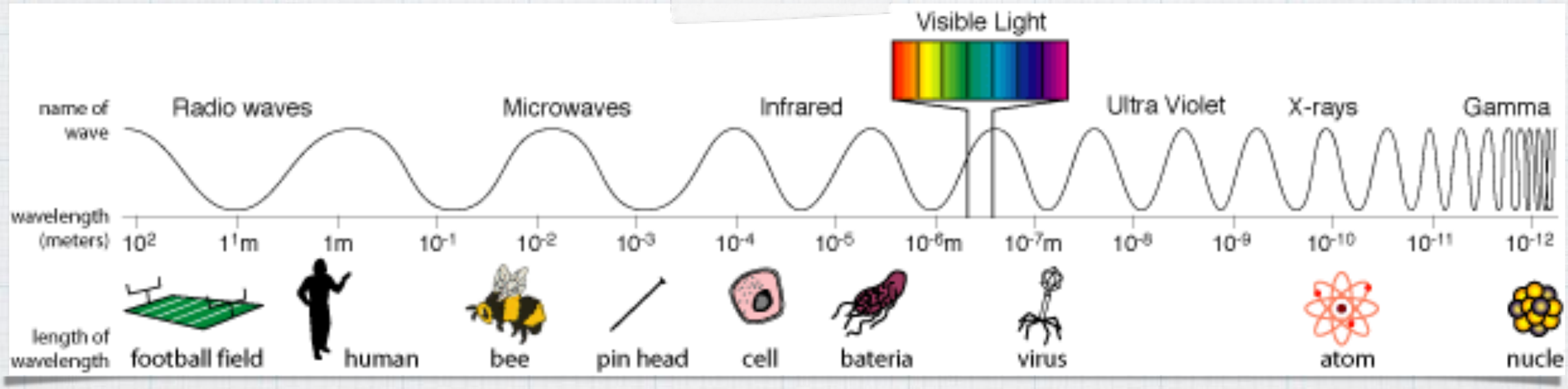
Line Spectra and Energy of Electrons



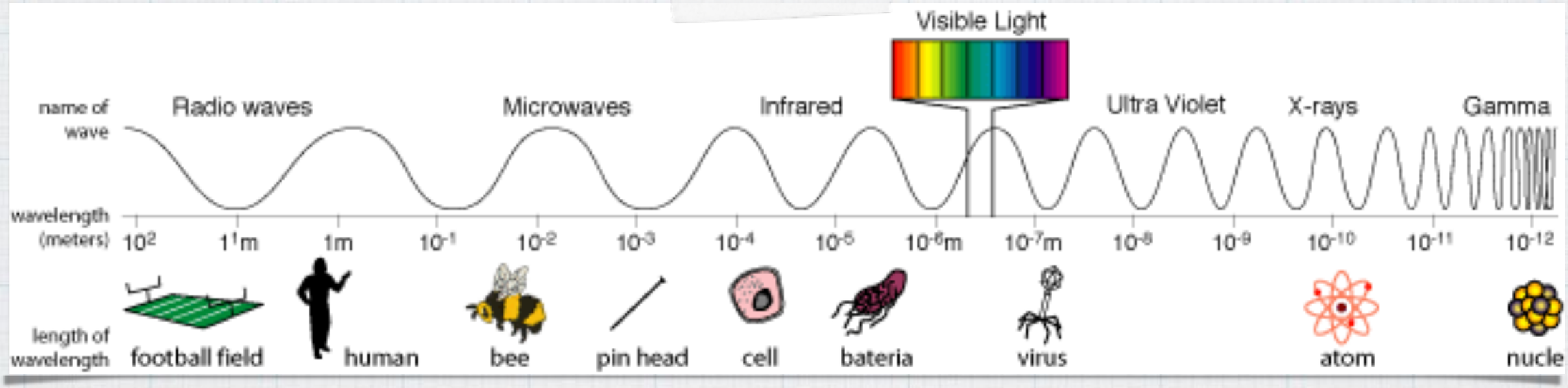
Electromagnetic Energy

* Contains visible light, infrared light, ultraviolet light, radio waves, microwaves and x-rays.



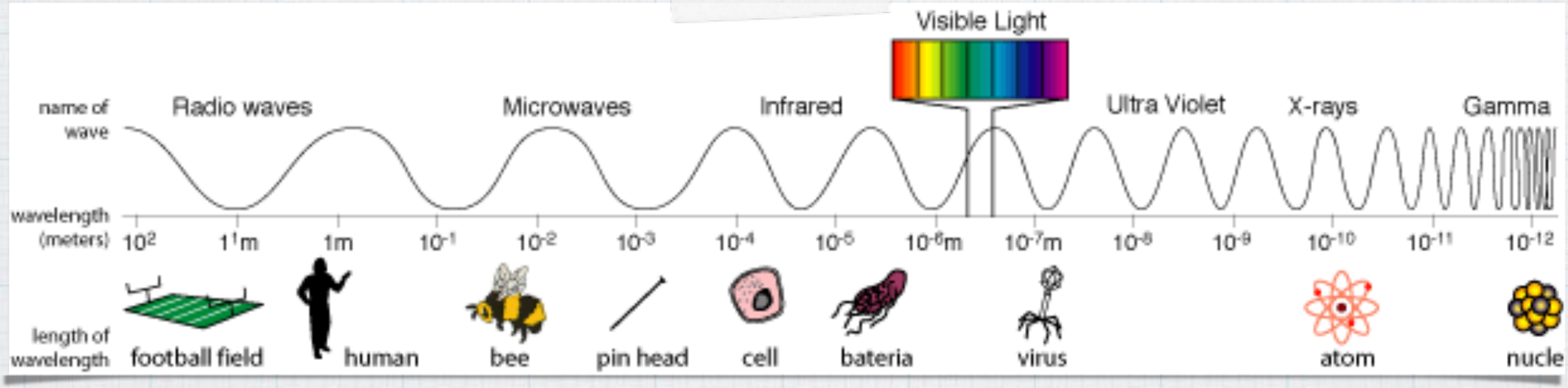
Electromagnetic Energy

* Low frequency waves have long wavelengths and low energy (radio waves, infared, visible light).



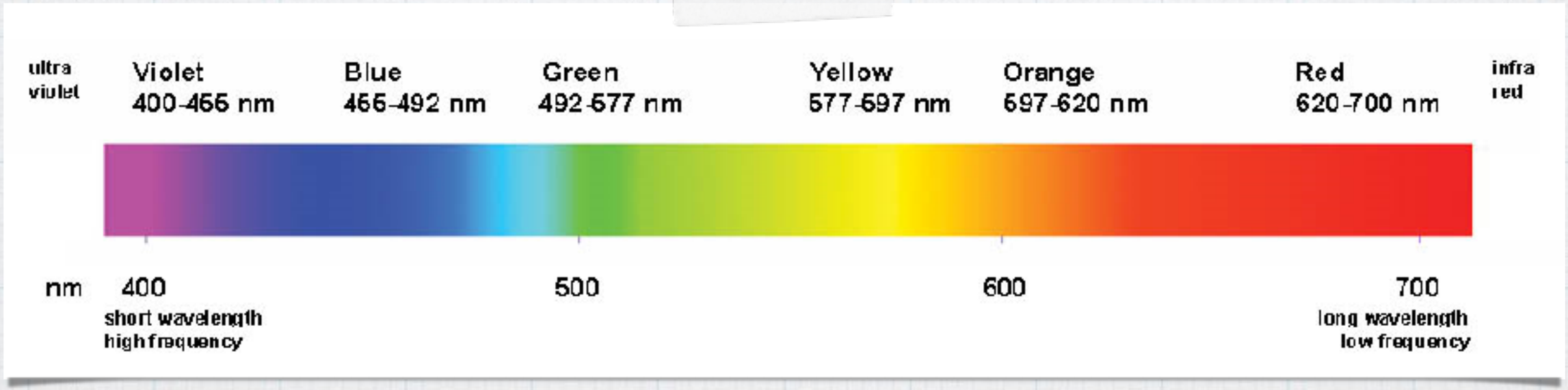
Electromagnetic Energy

* High frequency waves have high energy and short wavelengths (x-rays, gamma rays).



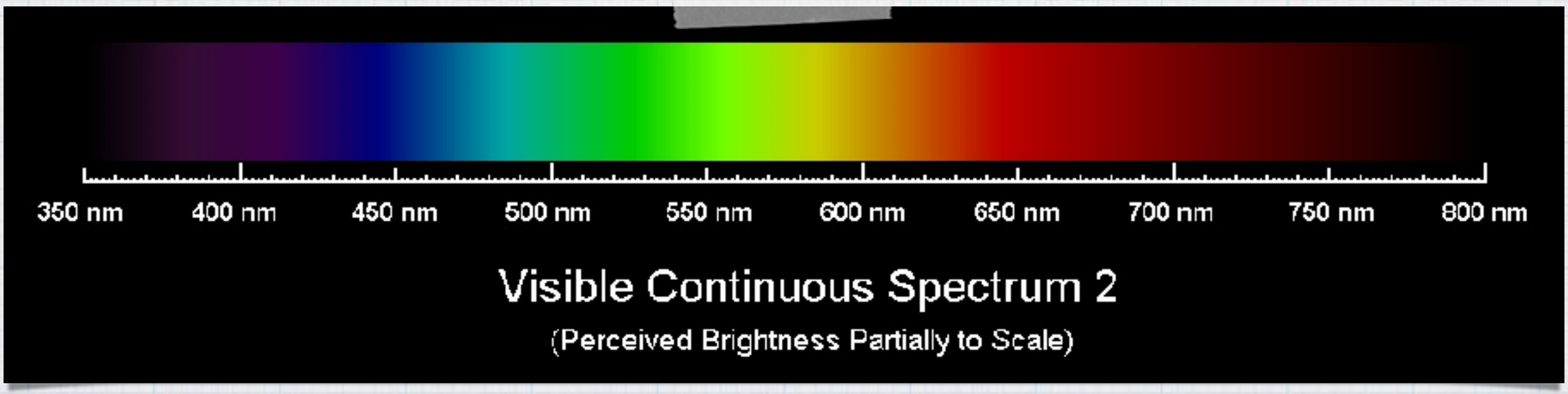
Visible Spectrum

* The region of the electromagnetic spectrum that the human eye can detect.
* Is composed of light waves with wavelengths from 400-700nm.



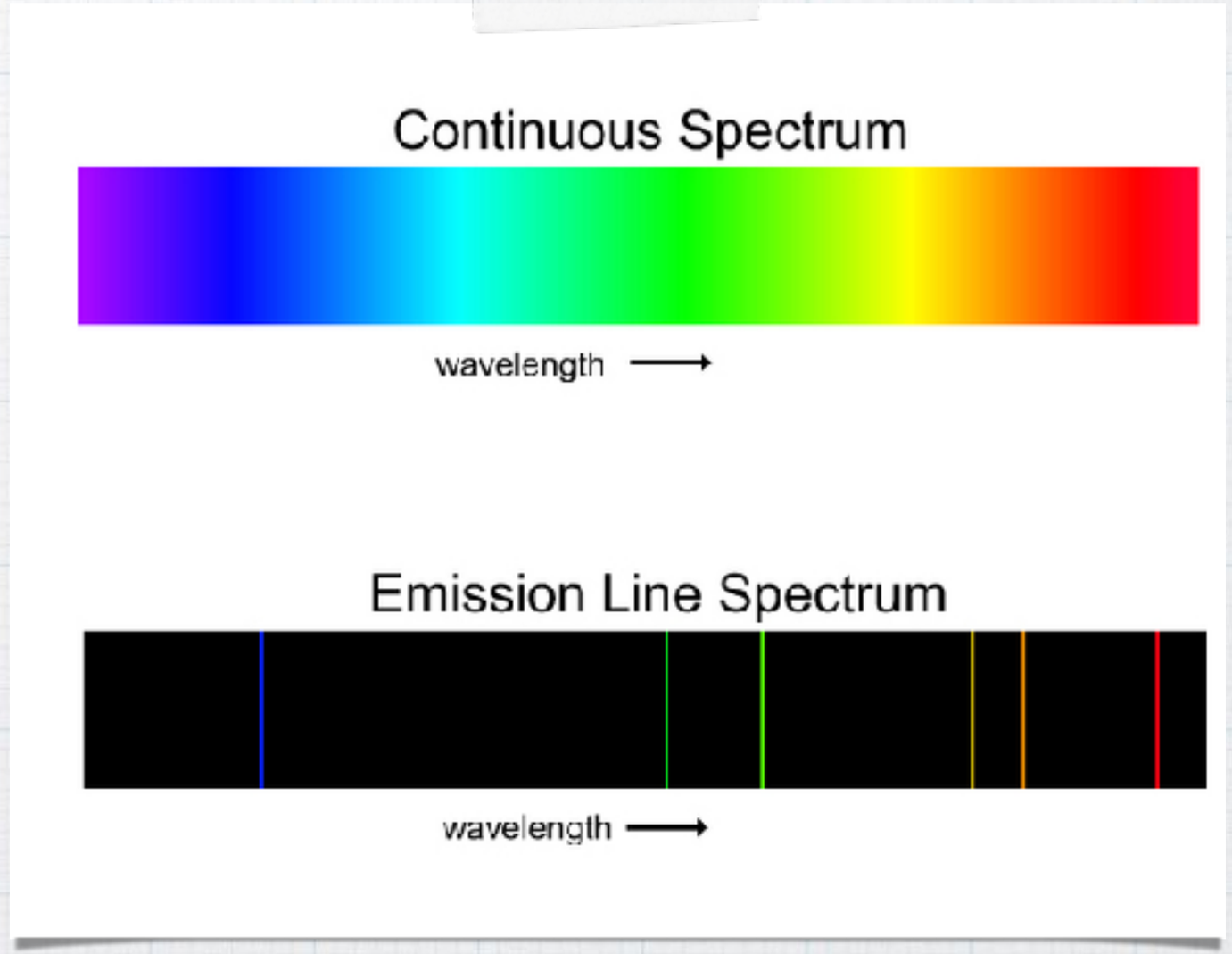
Continuous Spectrum

* A spectrum in which all the wavelengths of light are represented
* Eg. a rainbow



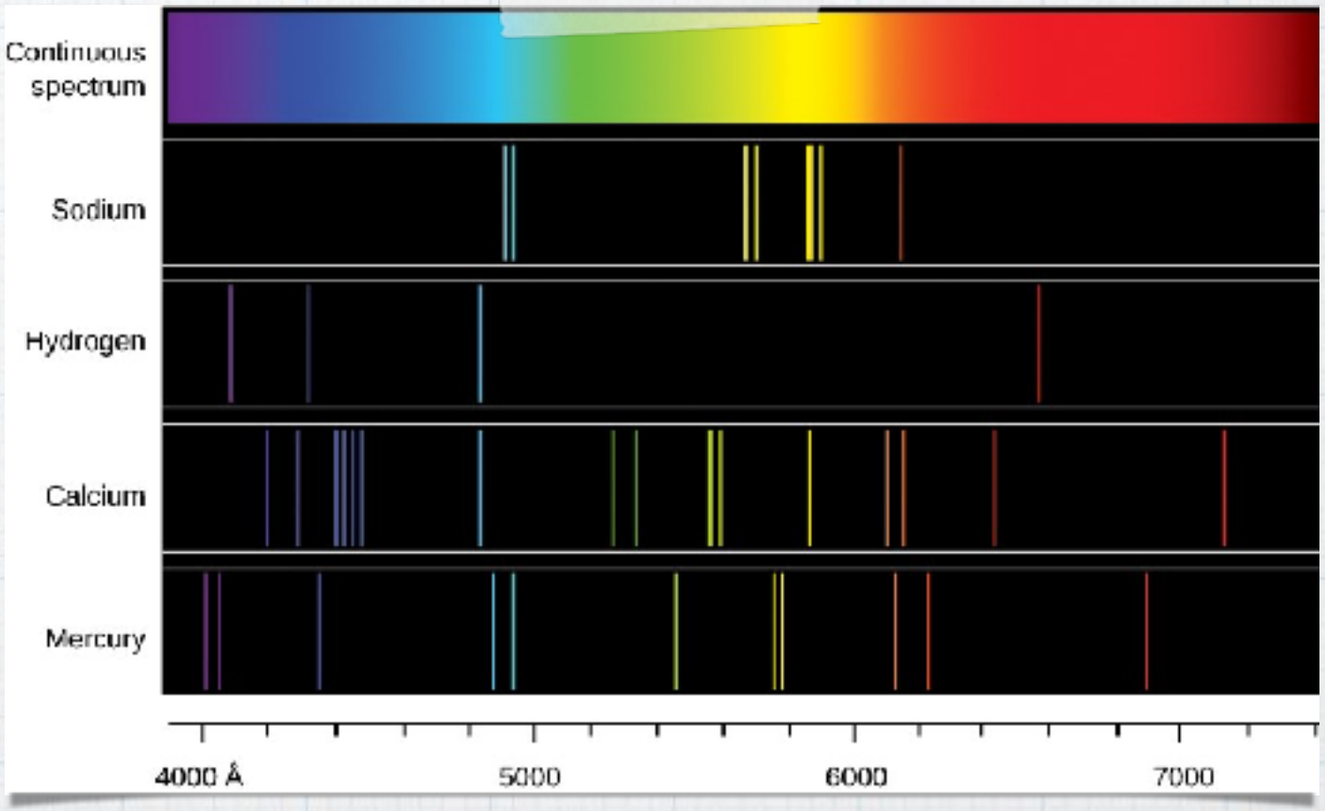
Line Spectrum

* A discontinuous spectrum that consists of distinct coloured lines rather than a rainbow



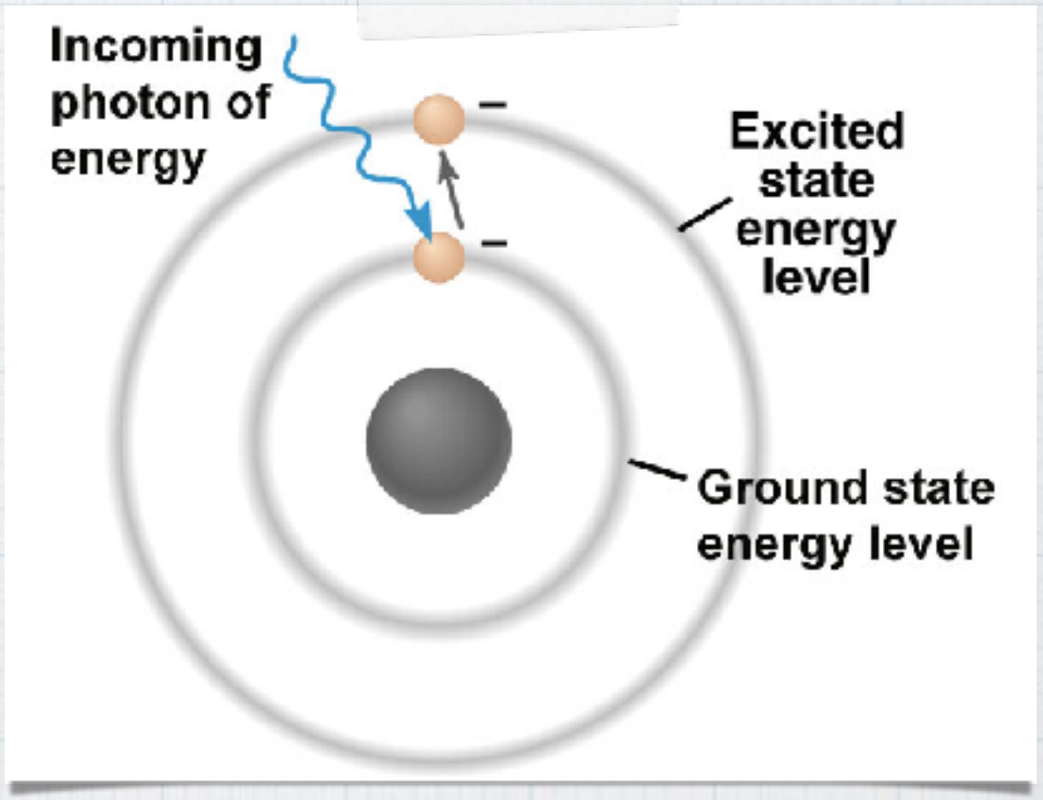
Line Spectrum

* Can be used to distinguish between different types of matter
* Different gases will have different line spectra



Line Spectrum

* Electron absorbs energy from the electromagnetic radiation (light).
* This "excites" the electron which allows it to jump to a higher energy level (excited state).



Line Spectrum

* The electron will fall back to its original position (called ground state).

* The only way to do this is to release the energy that was absorbed.