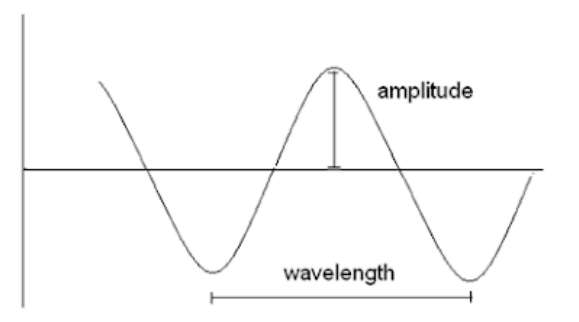


Chemistry
Unit 3 Light



Wavelength – the shortest distance between the equivalent points of the wave

Amplitude – the waves height

Frequency – how many waves pass a point per second

$$c = \lambda f$$

$c = 3 \times 10^8 \text{ m/s}$ speed of light

f = frequency (units is Hertz (Hz) or sec^{-1})

λ = wavelength (units is meters)

Example:

Green light has a frequency of 510nm, find the frequency.

(1meter = 1×10^{-9} nanometers)

→ convert nanometers to meters

$$5.10 \times 10^{-7} \text{ m}$$

→ solve for frequency

$$f = \frac{c}{\lambda} = \frac{3 \times 10^8 \text{ m/s}}{5.10 \times 10^{-7} \text{ m}} = 5.88 \times 10^{14} \text{ Hz}$$

Energy of a photon

$$E_{\text{photon}} = hf$$

h = plank's constant $6.626 \times 10^{-34} \text{ Js}$

f = frequency

Chemistry

Unit 3 Quantum Theory

Quantum Mechanical Model

Orbitals – regions around the nucleus where electrons are probable to be located (2 electrons in one orbital)

There are energy levels, and each energy level is assigned a principal quantum number(n)

Within energy levels there are sublevels

Principal Quantum Number (n)	Sublevels	Number of Orbitals	Total Number of Electrons (n^2)
1	s	1	1
2	s p	1 3	4
3	s p d	1 3 5	9
4	s p d f	1 3 5 7	16

