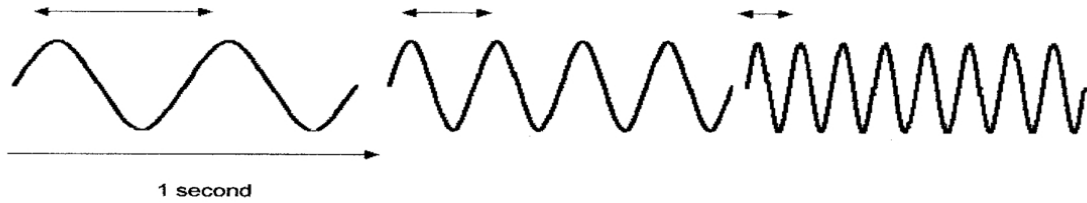


Worksheet 10 - Electromagnetic Radiation and the Bohr Atom

Light is known to have the **wave-like** properties of **frequency** (ν) and **wavelength** (λ). These are illustrated below. The x-axis is a measure of time. The distance between the peaks is called the **wavelength** and the number of waves per unit time (1 second in this example) is called the number of **cycles**. The first wave pattern has **2 cycles per second**, the middle example has **4 cycles per second** and the example on the right has **8 cycles per second**. This is the **frequency** of the wave, and has the units of **hertz, Hz** (cycles/s).



As the frequency increases, the wavelength decreases.

In **Electromagnetic radiation** (light) these are related by the equation:

$$c = \lambda \nu$$

where c = the speed of light, 2.998×10^8 m/s, λ = wavelength (m) and ν = frequency (s^{-1} or Hz). The electromagnetic spectrum (EMS) is shown below.

Which color of visible light has the shortest wavelength? Which radiation has wavelengths longer than visible light? *violet I.R.*

