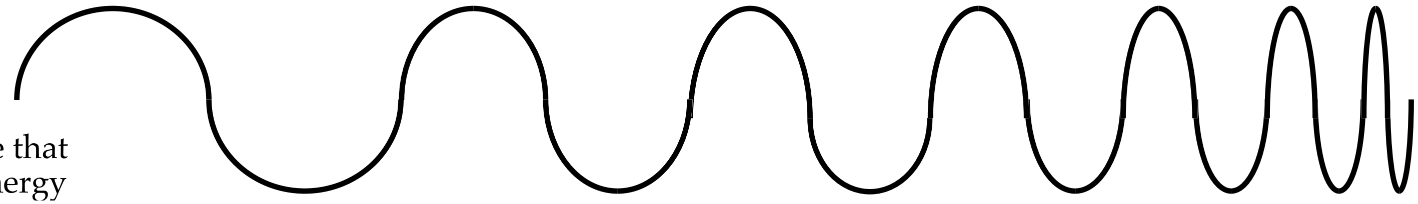
Wave:
A rhythmic disturbance that transfers energy



The Electromagnetic Spectrum

Low Frequency, ν (nu) in sec^{-1} — **High Frequency, ν**

$3x10^2$ **sec^{-1}** $3x10^8$ $3x10^{10}$ $3x10^{12}$ $4.3x10^{14}$ $7.5x10^{14}$ $3x10^{17}$ $3x10^{19}$ **sec^{-1}**

Low Energy | Power | Radio waves AM FM TV | Short wave | Microwaves | Infra-red | Visible Light | Ultra violet | X -rays | Gamma rays | **High Energy**

$1x10^6$ **meters** $1x10^0$ $1x10^{-2}$ $1x10^{-4}$ $7x10^{-7}$ $4x10^{-7}$ $1x10^{-9}$ $1x10^{-11}$ **meters**

Long Wavelength, λ (lambda) **in meters, m** — **Short Wavelength, λ**

Visible light spectrum (red to violet, Roy G. Biv)

Low Frequency, ν $4.3x10^{14}$ sec^{-1} $5x10^{14}$ $6x10^{14}$ $7.5x10^{14}$ sec^{-1} **High Frequency, ν**

(Infrared) | Red | Orange | Yellow | Green | Blue | Violet | *(Ultraviolet)*

Long Wavelength, λ 700 nm 600 550 500 450 400 nm **Short Wavelength, λ**

Notice that in this chart the wavelength is in **nanometers**, nm

Helpful Equations and conversions

Units for Frequency: sec^{-1} = 1/sec = cycles/sec = Hertz = Hz

$1 x10^3$ Hz = 1 kHz (kilohertz) $1 x 10^9$ nm = 1 m

c = Speed of light = $3.00 x 10^8$ m/sec (186000 miles/sec, or very fast) $h = 6.63x 10^{-34}$ J sec (Planck's constant)

$c = \nu \lambda$ (Speed of light = Frequency x Wavelength)

$E = h \nu$ or $E = \frac{h c}{\lambda}$ Energy of a photon of light is directly proportional to the frequency of the light, or inversely proportional to the wavelength