
LIGHT!!

Light Properties

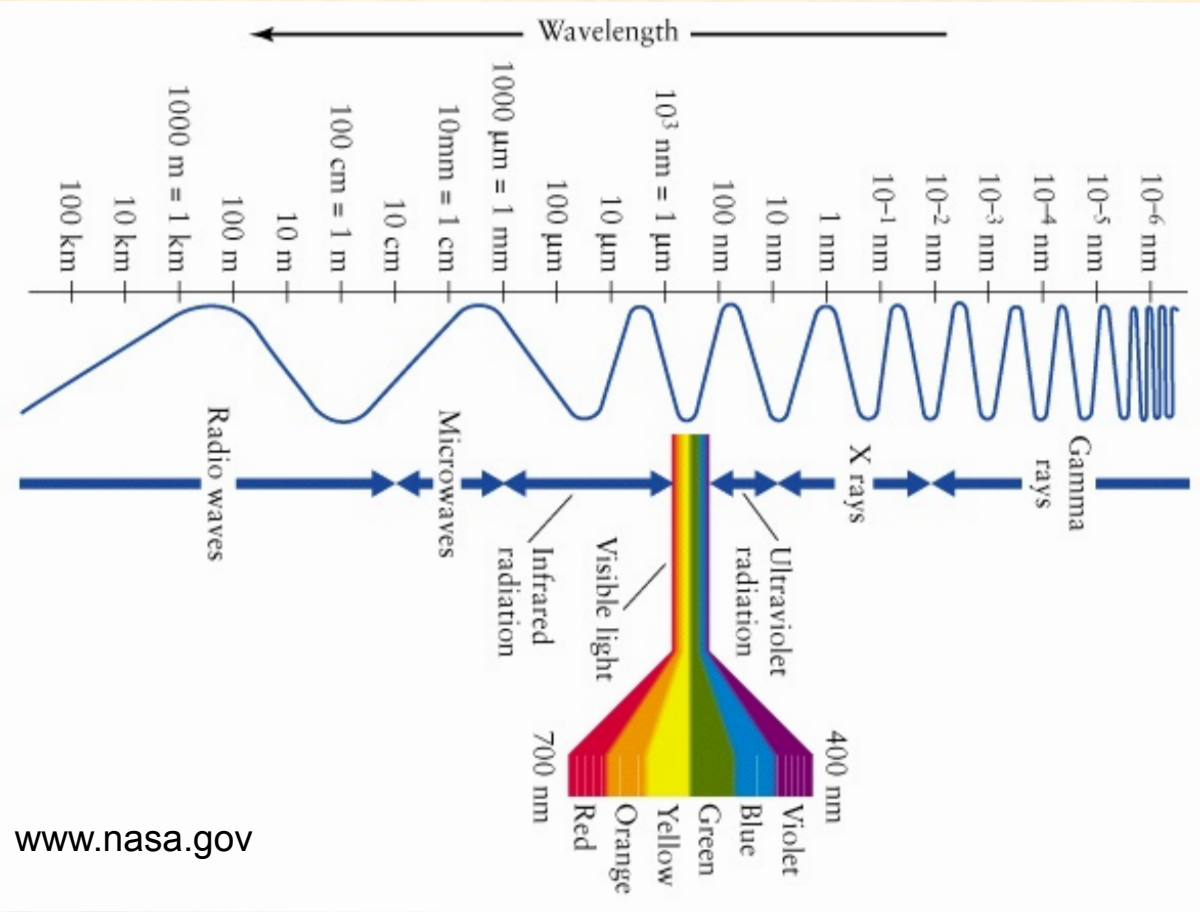
- Light travels at the speed of light ‘c’
- C = 3×10^8 m/s
- Or 190,000 miles/second!!
- Light could travel around the world about 8 times in one second

What is light??

- Light is “made” out of photons
- Photons can be considered a particle and a wave!!
- What does that mean?
- A photon is a “wave packet”
- A photon is a “light particle”

Electromagnetic Radiation and You

- Light is sometimes called E-M radiation
- All things emit E-M radiation
- You emit Infra Red radiation (heat)



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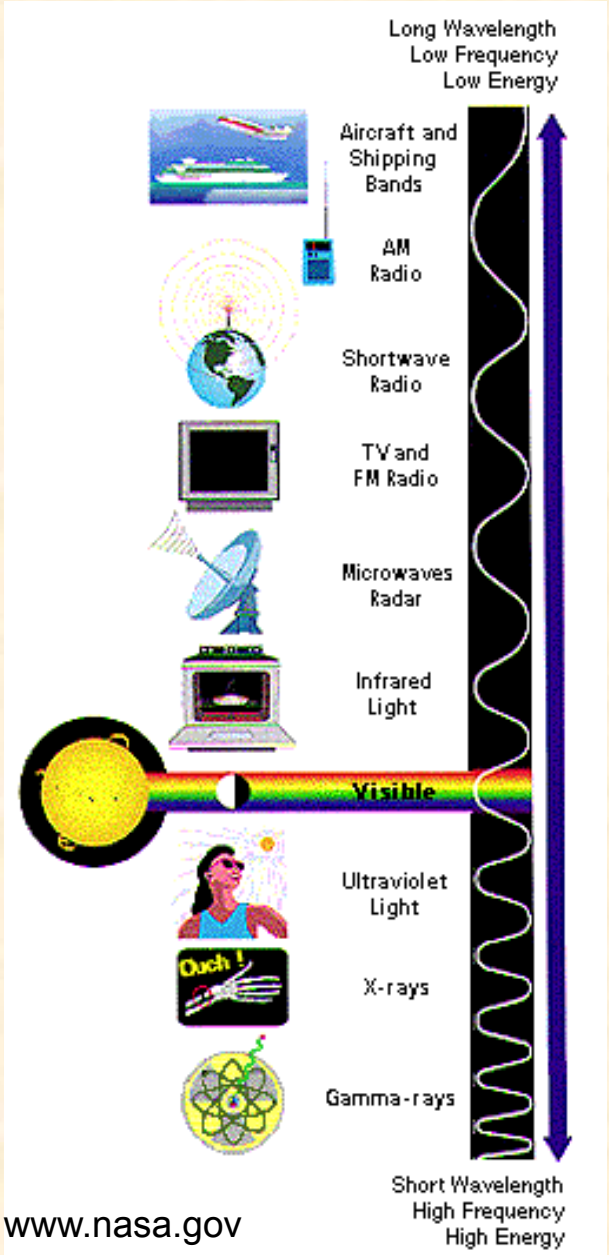
The Visible Spectrum

http://en.wikipedia.org/wiki/Visible_spectrum

red	620-750 nm
orange	590-620 nm
yellow	570-590 nm
green	495-570 nm
blue	450-495 nm
indigo	420-450 nm
violet	380-420 nm

Wavelength and Frequency



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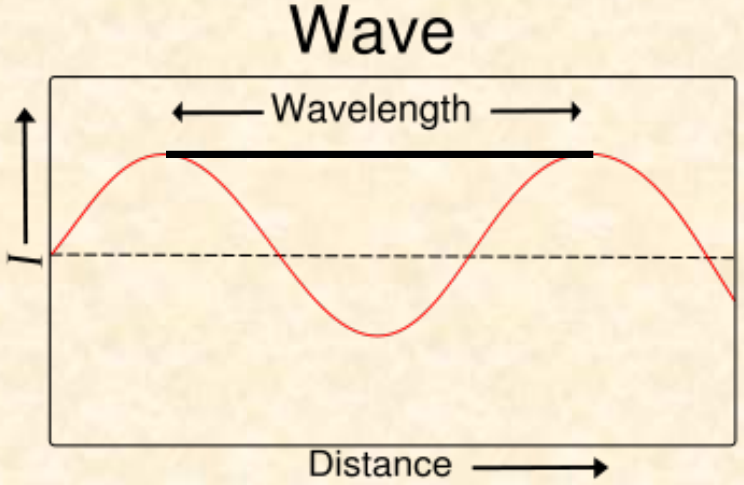


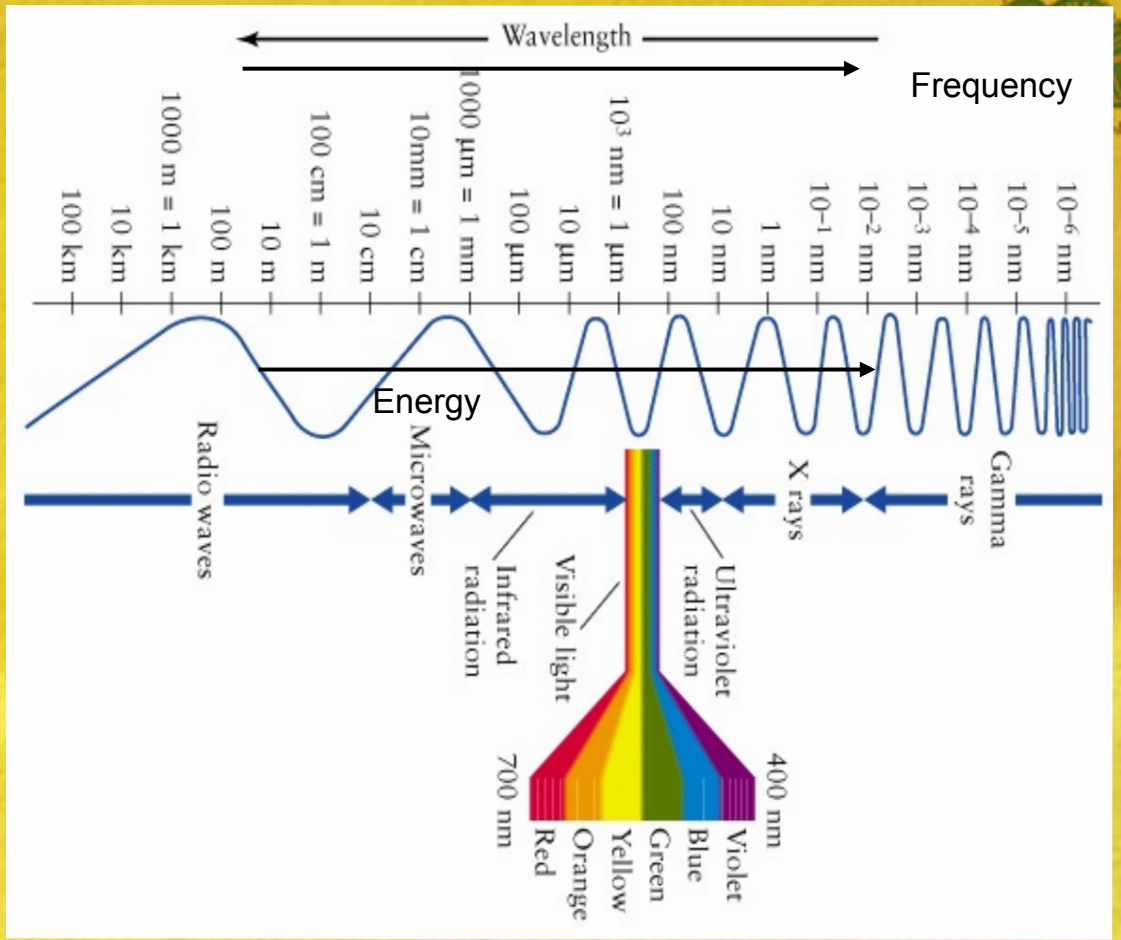
- Wavelength is the distance between two peaks (or troughs)
- Frequency is how frequently the waves occur
- A longer wavelength means a lower frequency
- A shorter wavelength means a higher frequency

The speed of light

- The speed of light ‘c’ is equal to the frequency ‘υ’times the wavelength of light ‘λ’
- Frequency is measured in Hertz (Hz)
- Hz = 1/ second
- Wavelength is measured in units of length
- $c = \upsilon \times \lambda$

Energy

- The shorter the frequency, the higher the energy of the light!
- $E = h \times \upsilon$ where 'h' is a constant
- $h = 6.626 \times 10^{-34}$ Joules *second
- Energy is measured in Joules, 'J'
- $J = Watts/m^2$
- Higher energy = high frequency = short wavelength!!



Two Girls in the IR

Is this in “true color?”

Extra Credit Opportunity: Wein's Law

- What is Wein's Law?
- Go to: http://en.wikipedia.org/wiki/Wien%27s_Displacement_Law
- What's wrong with the plot in the upper right hand side?