April 1, 2008 Chem 115 Notes

The longer the wavelength, the lower the frequency
Speed : how fast the wave is moving/propagating
Light travels slower the denser the medium is.

> contrast- Putting your ear on train tracks allows you to "hear" the train from very far away. So sound travels faster the denser the medium is.

Electromagnetic spectrum

- Logarithmic scale is what is on the figure shown in the book and in the lecture slides
- Inversely related - wavelength short, high frequency

Wavelength

- The wavelength of visible light is GREATER THAN the wavelength of Ultra Violet rays

Frequency

- The frequency of visible light is LESS THAN the frequency of UV rays

If wavelength given in nm, you MUST CONVERT wavelength (λ) into meters to use the constant of the speed of light (c) in the equation $c = \lambda \nu$

As temperature rises, the frequency of the radiation increases in blackbody radiation

Planck's Constant
Light energy proportional to frequency, not intensity
$E = h\nu$
where $h = 6.626 \times 10^{-34}$ Joules-seconds

- Matter is allowed to emit and absorb energy ONLY in whole-number multiples of $h\nu$

Electrons can be in different energy states
Speed is directly related to kinetic energy
Properties of light explained by wave behavior and/or particle behavior