

$$s = \lambda f$$

$$s = 3.0 \times 10^8 \text{ m/s}$$

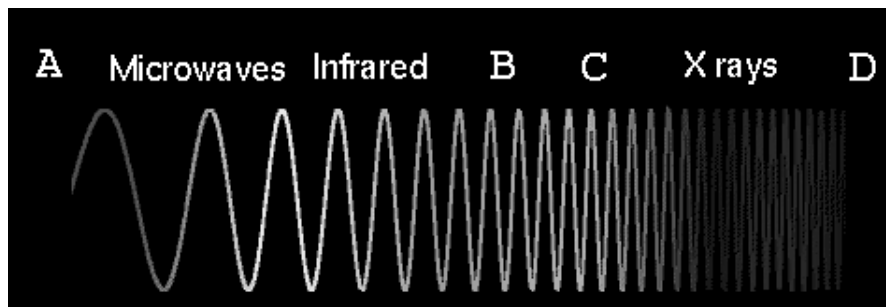
$$E = hf$$

$$h = 6.63 \times 10^{-34} \text{ J}\cdot\text{s}$$

Chemistry
Light Equation Practice

Name _____
Date _____

1. In the spaces provided, write the names for the types of electromagnetic waves labeled A-D. Choose from the following list: Radio waves, gamma rays, visible light, ultraviolet waves



A _____ B _____ C _____ D _____

2. Which wave above moves the fastest? Explain.
3. What is the frequency range for visible light? _____
4. What is the color of the...
 - a. longest wavelength visible light? _____
 - b. shortest wavelength visible light? _____
 - c. Determine the frequency of each of these lights.
5. The yellow light given off by a sodium vapor lamp used for public lighting has a wavelength of 589 nm. What is the frequency of this radiation?
6. A laser used to weld detached retinas produces radiation with a frequency of 4.69×10^{14} Hz. What is the wavelength of this radiation?
7. What is the wavelength of radiation whose frequency is 6.24×10^{14} Hz? Would you be able to see this radiation? (Does it fall within the visible range of colors on the spectrum?)

8. A neon light emits radiation of 616 nm wavelength. What is the frequency of this radiation?
9. Excited barium atoms emit visible light whose frequency is 6.59×10^{14} Hz. Determine the wavelength.
10. The frequency of the radiation used in all microwave ovens sold in the United States is 2.45 GHz (the unit GHz stands for “gigahertz”; 1 GHz is a billion cycles per second, or 10^9 s^{-1}). What is the wavelength (in meters) of this radiation?
11. The U.S. Navy has a system for communicating with submerged submarines. The system uses radio waves with a frequency of 76 s^{-1} . What is the wavelength of this radiation in meters?
12. An Argon laser releases light from excited electrons at a frequency of 6.29×10^{14} Hz.
- Determine the speed at which this light travels.
 - Determine the wavelength of this light?
 - Determine the change in energy of the electrons releasing these photons.
13. Determine the energy related to an electron occupying the ground state a Hydrogen atom given its bright-line spectrum below:



14. Calculate the energy of an X-ray photon if the wavelength is 5.00×10^{-10} m?
15. An ultraviolet wave has a wavelength of 725 nm.
- Determine the frequency of this wave.
 - Determine the energy change of the electron giving this light off.