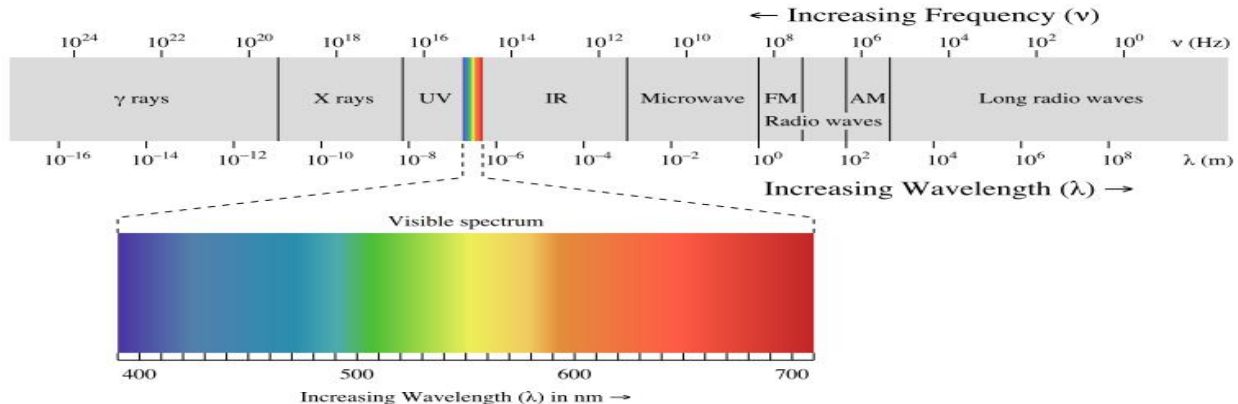


The Electromagnetic Spectrum – Level 1

We need to make sure you have some basic understandings and vocabulary down before we can move on. Please follow the instructions below to label the electromagnetic spectrum and answer the questions.



1. Label the ends of the electromagnetic spectrum as either high frequency or low frequency (label both).
2. Label the ends of the electromagnetic spectrum as either long wavelength or short wavelength (label both).
3. Label the ends of the electromagnetic spectrum as either high energy or low energy (label both).
4. What is the mathematical relationship between frequency and wavelength?
 - a. If we increased frequency what should happen to wavelength?
5. What is the mathematical relationship between energy and frequency?
 - a. If we wanted a higher energy what frequency would we choose?
6. What is the mathematical relationship between wavelength and energy?
 - a. If we had a long wavelength light what would the relative energy be?
7. What is meant by the terms “excited electrons” and “ground state electrons”?

Please solve the following problems. You must show your work to get credit!

1. Calculate the energy (E) of a beam of light with a frequency of 20 Hz. (Use the equation: $E = hf$)
Planck's constant = 6.63×10^{-34} J*s
2. Calculate the energy (E) of a beam of light with a wavelength of 499×10^{-7} m.
(Use the equation: $E = \frac{hc}{\lambda}$) Planck's constant = 6.63×10^{-34} J*s and $c = 3.00 \times 10^8$ m/s
3. Calculate the energy (E) of a beam of light with a frequency of 10 Hz. (Use the equation: $E = hf$)
Planck's constant = 6.63×10^{-34} J*s