**Introduction to Natural Science, Winter 2007**
**Chemistry Workshop – Week 2**

1. Photosynthesis uses 660 nm light to convert $CO_2$ and $H_2O$ into glucose and $O_2$. What is the frequency and energy of this light? In what region of the electromagnetic spectrum will this light be?

2. NPR Radio in Western Washington broadcasts at 88.5 MHz. What is the wavelength and energy of this light? In what region of the electromagnetic spectrum will this light be?

3. Microwave radiation has a wavelength on the order of 1.0 cm. Calculate the frequency and the energy of a single photon of this radiation. Calculate the energy of an Avogadro's number of photons (called an *einstein*) of this radiation.

4. One type of electromagnetic radiation has a frequency of 107.1 MHz, a second type has a wavelength of $2.12 \times 10^{-10}$ m, and a third type of electromagnetic radiation has photons with energy equal to $3.97 \times 10^{-19}$ J/photon. Identify each type of electromagnetic radiation and place them in the orders of increasing photon energy, increasing frequency, and increasing wavelength.