Name: _____ **Date:** _____ **Class:** _____

Energy Homework

Helpful Hints: 1 meter = 10^9 nanometers
Assume all waves are traveling in a vacuum, unless otherwise noted.

1. List the electromagnetic spectrum from highest to lowest energy.

2. List the electromagnetic spectrum from longest to shortest wavelength.

3. Calculate the frequency of ultraviolet A with a wavelength of 350 nm.

4. Calculate the energy, in quanta, of the ray above.

5. Calculate the frequency of a wave traveling with a wavelength of 1.2 meters. What type of ray would this most likely be?

6. Calculate the energy of a photon traveling with a frequency of $1.0 \times 10^5\ s^{-1}$.

7. Copper absorbs energy with a wavelength of 510 nm. If 2.20×10^4 J of energy is emitted, calculate the number of copper atoms that were present. Assume 1 atom emits 1 quantum.

8. In problem 7, how many grams of copper were present?

9. Calculate the frequency of a wave of wavelength 1.50×10^2 centimeters traveling at 80 % of the speed of light in a vacuum?

10. Calculate the energy for visible light of wavelength 400 nm, 550 nm and 700 nm. Graph energy vs. wavelength. What can be said about the relationship of energy to wavelength?