

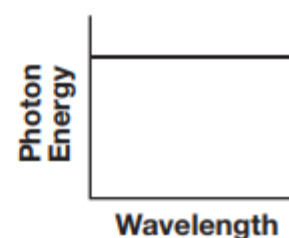
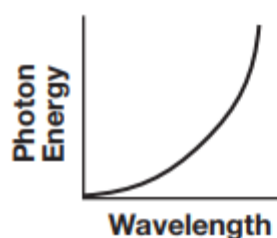
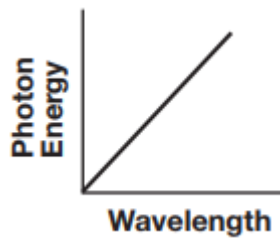
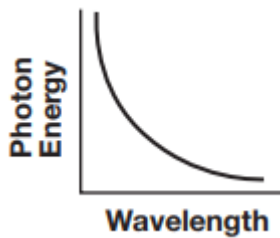
Name _____
Honors Physics
Period _____

Date _____
Modern WS #1H
Mrs. Nadworny

Photon Energy

Directions: Read online textbook pages 830 - 839. Solve the following problems using the GUESS method and proper significant figures. Be sure to show ALL work.

- A variable-frequency light source emits a series of photons. As the frequency of the photon increases, what happens to the energy and wavelength of the photon?
 - The energy decreases and the wavelength decreases.
 - The energy decreases and the wavelength increases.
 - The energy increases and the wavelength decreases.
 - The energy increases and the wavelength increases.
- Experiments performed with light indicate that light exhibits
 - both particle and wave properties
 - particle properties, only
 - wave properties, only
 - neither particle nor wave properties
- A photon of which electromagnetic radiation has the most energy?
 - ultraviolet
 - microwave
 - infrared
 - x-ray
- A gamma ray photon and a microwave photon are traveling in a vacuum. Compared to the wavelength and energy of the gamma ray photon, the microwave photon has a
 - shorter wavelength and less energy
 - shorter wavelength and more energy
 - longer wavelength and less energy
 - longer wavelength and more energy
- A blue-light photon has a wavelength of 4.80×10^{-7} meter. What is the energy of the photon?
 - 1.86×10^{22} J
 - 4.14×10^{-19} J
 - 1.44×10^2 J
 - 3.18×10^{-26} J
- Which graph best represents the relationship between photon energy and photon wavelength?



- What is the energy of a photon whose wavelength is 9.82×10^{-7} m?

8. Photons strike a metal surface with a work function of 2.1 eV, ejecting photoelectrons with a maximum kinetic energy of 7.5 eV. Calculate the energy of the photons.

9. What is the energy of a photon whose frequency is 6.37×10^{14} Hz? What color light is it?

10. The energy of a photon is 3.23 eV.

a. Calculate the energy of the photon in joules.

b. Calculate the wavelength of the photon.

c. Calculate the frequency of the photon.

d. Determine the type of electromagnetic radiation associated with the photon.

Answers in size order: 2.03×10^{-19} , 4.22×10^{-19} , 5.17×10^{-19} , 3.85×10^{-7} , 9.6, 7.79×10^{14} or 7.80×10^{14}