Directions: Complete the following problems according to the Light and Reflection lesson.

1. The speed of light in a vacuum is: _____________________

2. Wave speed equation
   a. Where the variables equal:

Use your reference table to determine:

- Which color of light has the shortest wavelength?
- What is the color of light that possesses a frequency of \(5.10 \times 10^{14}\) hz?
- A photon of light has a frequency of \(4.0 \times 10^{10}\) hz. What range of the EMS is it in?
- Which photon has more energy?
  - Gamma or infrared?

2. Which of the following statements is true about the speeds of gamma rays and radio waves in a vacuum?
   F. Gamma rays travel faster than radio waves.
   G. Radio rays travel faster than gamma rays.
   H. Gamma rays and radio waves travel at the same speed in a vacuum.
   J. The speed of gamma rays and radio waves in a vacuum depends on their frequencies.

EMS Short Response Practice Problem

- What is the frequency of a photon of light that has a wavelength of \(3.8 \times 10^{-7}\) m?
- What region of the EMS is it located?

Short Response, continued

13. X rays emitted from material around compact massive stars, such as neutron stars or black holes, serve to help locate and identify such objects. What would be the wavelength of the X rays emitted from material around such an object if the X rays have a frequency of \(5.0 \times 10^{19}\) Hz?