

Period, Frequency, Wavelength, and Wave Speed Practice

Directions: Show all necessary work and steps on a separate sheet of paper. EM waves (radio, micro, x ray, UV, visible, infrared, x-ray, gamma) travel at the speed of light: 3×10^8 m/s. Sound waves travel at 340 m/s (unless said otherwise).

Wave speed, wavelength, frequency

- 1) Red light has longer wavelength than violet light. Which color has a lower frequency?
Which has less energy?
- 2) Green light has a shorter wavelength than orange light. Which color has a greater frequency? Which has more energy?
- 3) What is the relationship between frequency and wavelength? What does that mean?
- 4) What is the relationship between frequency and energy? What does that mean?
- 5) Determine the frequency of a microwave that is 0.06 m in length. (5×10^9 Hz)
- 6) A low frequency radio wave has a frequency of 250,000 Hz. What is its wavelength?
(1200 m)
- 7) A certain wave in the EM spectrum has a frequency of 2×10^{12} Hz. What is its wavelength?
(1.5×10^{-4} m)
- 8) Calculate the frequency of red light with a wavelength of 6.50×10^{-7} m. (4.61×10^{14} Hz)
- 9) Calculate the wavelength of given the frequency of an electromagnetic wave of 6.10×10^{14} Hz. (4.91×10^{-7} m)
- 10) Calculate the frequency of light with a wavelength of 2.50×10^{-7} m. (1.2×10^{15} Hz)
- 11) If violet light has wavelength of 4.10×10^{-12} m. What is the frequency? (7.31×10^{19} Hz)
- 12) Green light has a frequency of 6.01×10^{14} Hz. What is the wavelength? (4.99×10^{-7} m)
- 13) A visible light with a frequency of 7.26×10^{14} Hz is emitted by an object. Calculate the wavelength of light. (4.13×10^{-7} m)
- 14) A visible light with a frequency of 5.32×10^{14} Hz is emitted by an object. Calculate the wavelength of light. (5.63×10^{-7} m)