

Wavelength, Frequency, Speed & Energy Worksheet

$$c = \lambda \nu$$

$$\nu = c / \lambda$$

$$\lambda = c / \nu$$

$$E = h\nu$$

$$E = hc/\lambda$$

c = speed of light (3.0×10^8 m/s)

λ = wavelength

ν = frequency

E = energy

h = Planck's constant (6.6262×10^{-34} J•s)

1. Calculate the **λ** given the **ν** of radiation is $5.10 \times 10^{14} \text{ s}^{-1}$

2. Calculate the **frequency** of red light with **λ** = $6.50 \times 10^{-7} \text{ m}$

3. The more I shave my face, the shorter my beard is an example of a inversely proportional or directly proportional relationship? _____
4. The more I lift weights, the stronger I become, is an example of an inversely proportional or directly proportional relationship. _____
5. The longer the wavelength, the _____ the frequency, is an _____ relationship
6. Which color has the longest wavelength? _____
7. Which color has the shortest wavelength? _____
8. On the EM Spectrum, which type of wave has the longest wavelength? _____
9. On the EM Spectrum, which type of wave has the shortest wavelength? _____

10. What is the **energy** of x- radiation with a $1 \times 10^{-6} \text{ m}$ **wavelength**?

11. What is the **energy** (Joules) of Violet light with a **frequency** = $7.50 \times 10^{14} \text{ s}^{-1}$.

12. The higher the frequency, the _____ (higher / lower) the energy. This is an example of a/an _____ (inverse/direct) relationship.
13. The higher the wavelength, the _____ (higher / lower) the energy. This is an example of a/an _____ (inverse/direct) relationship.
14. Which color has the most energy? _____
15. Which color has the least energy? _____
16. On the EM Spectrum, which type of wave has the most energy? _____
17. On the EM Spectrum, which type of wave has the least energy? _____