

## Wavelength, Frequency, Speed & Energy Worksheet

$$c = \lambda \nu$$

$$\nu = c / \lambda$$

$$\lambda = c / \nu$$

$$E = h\nu$$

$$E = hc/\lambda$$

$c$  = speed of light ( $3.0 \times 10^8$  m/s)

$\lambda$  = wavelength

$\nu$  = frequency

$E$  = energy

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

1. Calculate the  $\lambda$  given the  $\nu$  of radiation is  $5.10 \times 10^{14} \text{ s}^{-1}$
2. Calculate the **frequency** of red light with  $\lambda = 6.50 \times 10^{-7} \text{ m}$
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? \_\_\_\_\_