

Electromagnetic Waves  
Student Worksheet

Answer the following questions during or after your study of Electromagnetic Waves.

1. What is “waving” in an electromagnetic wave?
2. How fast do radio waves travel in a vacuum? How fast does red light travel in a vacuum? How fast do X-rays travel in a vacuum?
3. How is polarized light different from unpolarized light?
4. Which of the following are likely to act as a polarizing filter for radio waves: a picket fence consisting of long, thin slats made out of metal or wood?
5. What is the frequency of red light (650 nm) in a vacuum? What is the frequency in water, where the speed of light is only  $2.25 \times 10^8$  m/s?
6. How much energy does a photon of UV light (frequency =  $3.6 \times 10^{16}$  Hz) have?
7. Compare the energy, frequency, speed, and wavelength of microwaves and gamma rays.

_____ waves disturb matter.	6. _____
_____ is the top of a wave.	7. The _____
_____ is the bottom of a wave.	8. The _____
_____ is the maximum distance that matter is displaced from the resting position.	9. _____ resting position.
_____ waves are produced by stars and galaxies.	10. _____
_____ waves occur when the motion of the medium is at right (perpendicular) to the direction of the wave.	11. _____ angles (perpendicular).
_____ waves are often used in heat lamps.	12. _____
_____ waves are utilized by insects to locate nectar.	13. _____
_____ waves are transverse waves that disturb electromagnetic fields.	14. _____ fields.
_____ waves have the shortest wavelength and the highest frequency.	15. _____ frequency.