

Chapter 18 The Electromagnetic Spectrum and Light

Section 18.2 The Electromagnetic Spectrum

(pages 539–545)

This section identifies the waves in the electromagnetic spectrum and describes their uses.

Reading Strategy (page 539)

Summarizing Complete the table for the electromagnetic spectrum. List at least two uses for each kind of wave. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

The Electromagnetic Spectrum		
Type of Waves	Uses	
Radio Waves	Communications	
Infrared Rays		Keeping food warm

The Waves of the Spectrum (pages 539–540)

- Is the following sentence true or false? William Herschel determined that the temperature of colors of light was higher at the blue end and lower at the red end. _____
- Herschel’s curiosity led him to conclude there must be invisible _____ beyond the red end of the color band.
- Is the following sentence true or false? The full range of frequencies of electromagnetic radiation is called the electromagnetic spectrum. _____
- Name each kind of wave in the electromagnetic spectrum, from the longest to shortest wavelength.
 - _____
 - _____
 - _____
 - _____
 - _____
 - _____

Chapter 18 The Electromagnetic Spectrum and Light

Radio Waves (pages 540–542)

5. Circle the letter of each way that radio waves might be used.
- a. X-ray machines
 - b. microwave ovens
 - c. radio technology
 - d. television technology
6. What is the difference between amplitude modulation (AM) and frequency modulation (FM)? _____

7. How far do microwaves generally penetrate food? _____

8. How is the Doppler effect used to detect the speed of a vehicle? _____

Infrared Rays (page 543)

9. Circle the letter of each way infrared rays are used.
- a. source of light
 - b. to discover areas of heat differences
 - c. source of heat
 - d. to discover areas of depth differences
10. Thermograms show variations in _____ and are used to find places where a building loses heat to the environment.

Visible Light (page 543)

11. Is the following sentence true or false? One use for visible light is to help people communicate with one another. _____

Ultraviolet Rays (page 544)

12. Ultraviolet radiation has applications in _____ and _____.
13. Is the following sentence true or false? Ultraviolet radiation helps your skin produce vitamin D. _____

X-rays (page 544)

14. Is the following sentence true or false? X-rays have higher frequencies than ultraviolet rays. _____
15. Why are X-rays helpful? _____

Gamma Rays (page 545)

16. Gamma rays have the highest _____ and therefore the most _____ and the greatest penetrating ability of all the electromagnetic waves.
17. How is gamma radiation used in medicine? _____
