

# Chapter Review

## USING KEY TERMS

For each pair of terms, explain how the meanings of the terms differ.

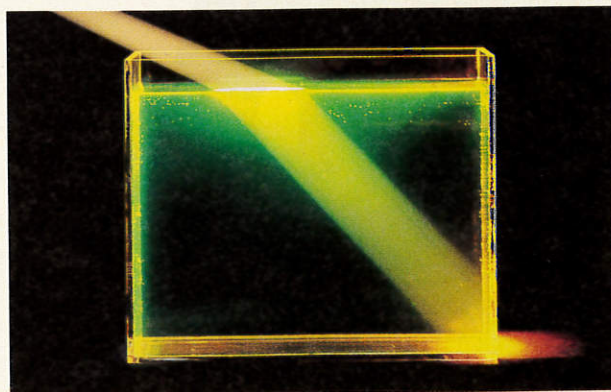
- 1 *longitudinal wave* and *transverse wave*
- 2 *wavelength* and *amplitude*
- 3 *reflection* and *refraction*

## UNDERSTANDING KEY IDEAS

### Multiple Choice

- 4 As the wavelength increases, the frequency
  - a. decreases.
  - b. increases.
  - c. remains the same.
  - d. increases and then decreases.
- 5 Waves transfer
 

a. matter.	c. particles.
b. energy.	d. water.
- 6 Refraction occurs when a wave enters a new medium at an angle because
  - a. the frequency changes.
  - b. the amplitude changes.
  - c. the wave speed changes.
  - d. None of the above



- 7 The wave property that is related to the height of a wave is the
  - a. wavelength.
  - b. amplitude.
  - c. frequency.
  - d. wave speed.
- 8 During constructive interference,
  - a. the amplitude increases.
  - b. the frequency decreases.
  - c. the wave speed increases.
  - d. All of the above
- 9 Waves that don't require a medium are
  - a. longitudinal waves.
  - b. electromagnetic waves.
  - c. surface waves.
  - d. mechanical waves.

### Short Answer

- 10 Draw a transverse wave and a longitudinal wave. Label a crest, a trough, a compression, a rarefaction, and wavelengths. Also, label the amplitude on the transverse wave.
- 11 What is the relationship between frequency, wave speed, and wavelength?

### Math Skills

- 12 A fisherman in a row boat notices that one wave crest passes his fishing line every 5 s. He estimates the distance between the crests to be 1.5 m and estimates that the crests of the waves are 0.5 m above the troughs. Using this data, determine the amplitude and speed of the waves.

## CRITICAL THINKING

- 13 **Concept Mapping** Use the following terms to create a concept map: *wave*, *refraction*, *transverse wave*, *longitudinal wave*, *wavelength*, *wave speed*, and *diffraction*.
- 14 **Analyzing Ideas** You have lost the paddles for the canoe you rented, and the canoe has drifted to the center of a pond. You need to get it back to the shore, but you do not want to get wet by swimming in the pond. Your friend suggests that you drop rocks behind the canoe to create waves that will push the canoe toward the shore. Will this solution work? Why or why not?
- 15 **Applying Concepts** Some opera singers can use their powerful voices to break crystal glasses. To do this, they sing one note very loudly and hold it for a long time. While the opera singer holds the note, the walls of the glass move back and forth until the glass shatters. Explain in terms of resonance how the glass shatters.



- 16 **Analyzing Processes** After setting up stereo speakers in your school's music room, you notice that in certain areas of the room, the sound from the speakers is very loud. In other areas, the sound is very soft. Using the concept of interference, explain why the sound levels in the music room vary.
- 17 **Predicting Consequences** A certain sound wave travels through water with a certain wavelength, frequency, and wave speed. A second sound wave with twice the frequency of the first wave then travels through the same water. What is the second wave's wavelength and wave speed compared to those of the first wave?

## INTERPRETING GRAPHICS

- 18 Look at the waves below. Rank the waves from highest energy to lowest energy, and explain your reasoning.

