

# Properties of Waves

(pages 515–519)

## Amplitude (page 516)

**Key Concept:** Amplitude is one basic property of waves.

- **Amplitude** is how far the medium moves when a wave passes through it.
- For a transverse wave, amplitude is how far the medium moves up or down. For a longitudinal wave, amplitude is how far the medium moves back or forth.
- Amplitude shows how much energy a wave has. The more energy a wave has, the bigger the amplitude of the wave.

*Answer the following questions. Use your textbook and the ideas above.*

1. Circle the letter of the choice that correctly describes the amplitude of a transverse wave.
  - a. how fast the medium moves back and forth
  - b. how far the medium moves up or down
  - c. how far the medium moves back and forth
2. Is the following sentence true or false? Amplitude shows how much energy a wave has. \_\_\_\_\_

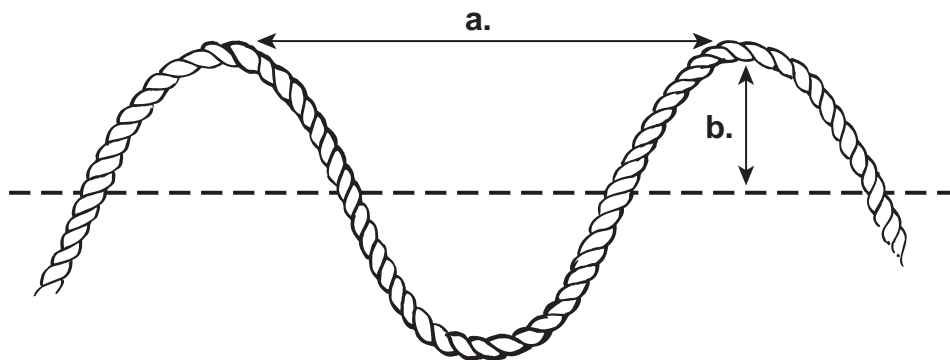
**Characteristics of Waves** ▪ *Adapted Reading and Study***Wavelength** (page 517)

**Key Concept:** Wavelength is a basic property of waves.

- **Wavelength** is how far a wave travels before it starts to repeat.
- To find the wavelength of a transverse wave, you can measure the distance between the top of one wave and the top of the next wave. Or, you can measure the distance between the bottom of one wave and the bottom of the next wave.

*Answer the following questions. Use your textbook and the ideas above.*

3. The distance a wave travels before it starts to repeat is the \_\_\_\_\_.
4. The picture shows a transverse wave. Which arrow shows the wavelength? \_\_\_\_\_



**Characteristics of Waves** ▪ *Adapted Reading and Study***Frequency** (page 517)

**Key Concept:** Frequency is a basic property of waves.

- **Frequency** is the number of waves that go by a point in a certain amount of time.
- Suppose water waves are moving past a post. If one wave passes the post each second, the frequency of the waves is one wave per second.
- Frequency is measured in units called **hertz** (Hz). If one wave passes a point each second, the frequency is 1 Hz. If two waves pass a point each second, the frequency is 2 Hz.

*Answer the following questions. Use your textbook and the ideas above.*

5. The number of waves that go by a point in a certain amount of time is the \_\_\_\_\_.
6. If three waves pass a point in one second, what is the frequency of the waves? Circle the letter of the correct answer.
  - a.  $1/3$  Hz
  - b. 1 Hz
  - c. 3 Hz

**Speed** (pages 518–519)

**Key Concept:** Speed is a basic property of waves. The speed, wavelength, and frequency of a wave are related to one another by a mathematical formula:

$$\text{Speed} = \text{Wavelength} \times \text{Frequency}$$

- Speed is how far a wave travels in a given amount of time. For example, if a wave travels 5 cm in 1 second, its speed is 5 cm per second.

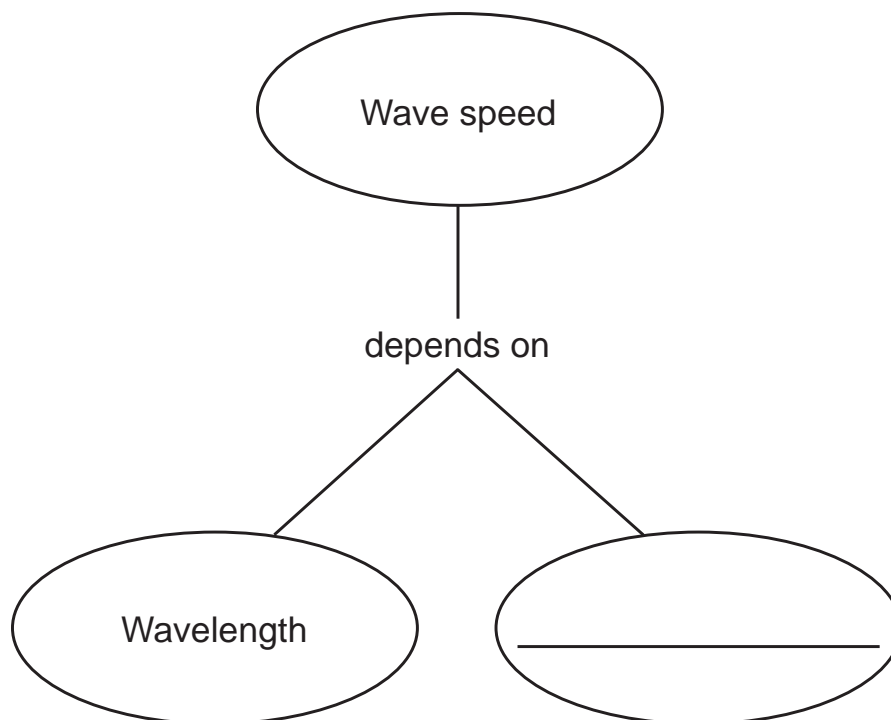
**Characteristics of Waves** ▪ *Adapted Reading and Study*

- To find the speed of a wave, you can multiply the wavelength times the frequency. Suppose the wavelength is 4 cm and the frequency is 1 wave per second. Then the speed is  $4 \text{ cm} \times 1 \text{ per second}$ , or 4 cm per second.

*Answer the following questions. Use your textbook and the ideas on page 219 and above.*

7. Is the following sentence true or false? The distance a wave travels in a given amount of time is the frequency.
- \_\_\_\_\_

8. Fill in the blank in the concept map about wave speed.



9. If a wave has a wavelength of 2 m and a frequency of 1 wave per second, what is the speed of the wave? Circle the letter of the correct answer.
- a. 2 m per second
  - b. 1 m per second
  - c. 0.5 m per second