

Chapter 17 Mechanical Waves and Sound

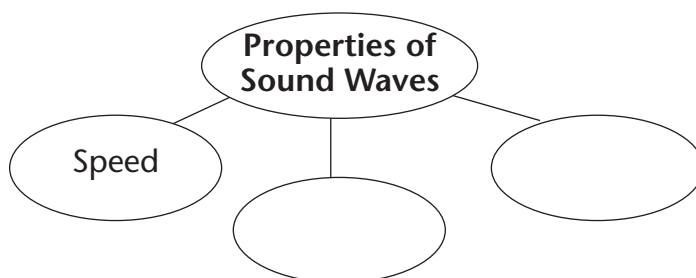
## Section 17.4 Sound and Hearing

(pages 514–521)

*This section discusses properties of sound waves, how they are produced, and how the ear perceives sound. It also describes how music is produced and recorded.*

### Reading Strategy (page 514)

**Using Prior Knowledge** Before you read, add properties you already know about sound waves to the diagram below. Then add details about each property as you read the section. 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.



### Properties of Sound Waves (pages 514–515)

1. Circle the letter of each sentence that is true about sound.
  - a. Many behaviors of sound can be explained using a few properties.
  - b. Sound waves are compressions and rarefactions that travel through a medium.
  - c. Sound waves usually travel more slowly in solids than in gases.

*Match each description with one or more sound properties.*

<b>Description</b>	<b>Property</b>
_____ 2. This property is measured in units called decibels.	a. loudness
_____ 3. These properties are affected by the length of tubing in a musical instrument.	b. pitch
_____ 4. This property is the frequency of a sound as your ears perceive it.	c. intensity
_____ 5. This property is a physical response to the intensity of sound.	d. frequency

**Chapter 17 Mechanical Waves and Sound**

**Ultrasound (page 516)**

6. Is the following sentence true or false? Ultrasound has frequencies that are lower than most people are capable of hearing. \_\_\_\_\_
7. Describe one application of ultrasound. \_\_\_\_\_
- \_\_\_\_\_

**The Doppler Effect (page 516)**

8. Is the following sentence true or false? The Doppler effect is a change in sound frequency caused by motion of the sound source, motion of the listener, or both. \_\_\_\_\_

**Hearing and the Ear (page 517)**

*Match each description with the appropriate region(s) of the ear.*

Description	Region
_____ 9. Sound is gathered and focused here.	a. outer ear
_____ 10. Nerve endings send signals to the brain.	b. middle ear
_____ 11. Hammer, anvil, and stirrup are located here.	c. inner ear
_____ 12. Sound vibrations are amplified.	

**How Sound Is Reproduced (pages 518–519)**

13. In recording sound, \_\_\_\_\_ are converted to electronic signals that are processed and stored. Circle the correct answer.  
 electronic waves      sound waves      ultrasound waves
14. Sound is reproduced by converting \_\_\_\_\_ back into sound waves.

**Music (page 521)**

15. Is the following sentence true or false? Many musical instruments vary pitch by changing the frequency of standing waves. \_\_\_\_\_
16. The response of a standing wave to another wave of the same frequency is called \_\_\_\_\_. Circle the correct answer.  
 amplification      interference      resonance