The Nature of Sound (pages 36–41)

Sound Waves (pages 36–37)

Key Concept: Sound is a disturbance that travels through a medium as a longitudinal wave.

• Sound waves are longitudinal waves. They begin with a back-and-forth vibration.
• If you pluck a guitar string, it vibrates back and forth. The vibrating string sends a longitudinal wave through the air.
• Sound waves need a medium to travel through. Sound waves can travel through gases such as air. They can also travel through liquids such as water and solids such as wood. You might hear a car horn when you are indoors because sound waves can travel through solid walls.

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

1. Circle the letter of the type of wave a sound wave is.
   a. transverse wave
   b. longitudinal wave
   c. combined wave

2. Is the following sentence true or false? Sound waves can travel only through air. ________
Interactions of Sound Waves  (pages 38–39)

Key Concept: Sound waves reflect off objects, diffract through narrow openings and around barriers, and interfere with each other.

- Sound waves can reflect, or bounce back. This happens when sound waves hit a wall or other hard surface. A reflected sound wave is called an echo. If you shout in an empty gym, you can hear an echo.
- Sound waves can diffract, or bend and spread out. Sound waves diffract when they pass through openings or around walls. You might hear someone talking around a corner because sound waves can bend and spread out.
- Sound waves can interfere, or bump into one another. When sound waves interfere, they make a single wave.

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

3. Read the words in the box. In each sentence below, fill in one of the words.

interference  echo  diffraction

a. A reflected sound wave is called a(an) ____________________.
b. When sound waves bump into one another, it is called ____________________.
4. Circle the letter of the type of sound wave interaction that the picture shows.
   a. reflection
   b. diffraction
   c. interference

The Speed of Sound  (pages 39–41)

Key Concept: The speed of sound depends on the elasticity, density, and temperature of the medium the sound travels through.

- Sound travels at different speeds in different mediums. For example, sound usually travels more quickly in solids than in gases.
- Sound travels faster in mediums that are elastic, or stretchy. A rubber band is very stretchy. Therefore, sound travels quickly in a rubber band.
Sound

- Sound travels more slowly in denser mediums. Something that is dense feels heavy for its size. Lead is a very dense solid. Therefore, sound travels more slowly in lead than in most other solids.

- Sound travels more quickly when the medium is warm. For example, sound travels more quickly in air that is 20°C than in air that is 0°C.

Answer the following questions. Use your textbook and the ideas on page 20 and above.

5. Is the following sentence true or false? Sound travels at the same speed in all mediums. ________

6. Fill in the blank in the concept map about the speed of sound.

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Speed of sound

is faster in a medium that is

Not dense

Elastic

______
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