Chapter 17    Mechanical Waves and Sound

Section 17.1 Mechanical Waves
(pages 500–503)

This section explains what mechanical waves are, how they form, and how they travel. Three main types of mechanical waves—transverse, longitudinal, and surface waves—are discussed and examples are given for each type.

Reading Strategy (page 500)

Previewing As you read this section, use Figure 2 on page 501 to complete the web diagram. Then use Figures 3 and 4 to make similar diagrams for longitudinal waves and surface waves on a separate sheet of paper. 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.

What Are Mechanical Waves? (page 500)

1. A disturbance in matter that carries energy from one place to another is called a(n) __________________.

2. Is the following sentence true or false? Mechanical waves can travel through empty space. ________________

3. The material through which a wave travels is called a(n) __________________.

4. Is the following sentence true or false? Solids, liquids, and gases all can act as mediums for waves. ________________

5. What creates a mechanical wave? ____________________________________________

Types of Mechanical Waves (pages 501–503)

6. Is the following sentence true or false? The three main types of mechanical waves are water waves, longitudinal waves, and surface waves. ________________

7. Circle the letter of the characteristic used to classify a mechanical wave.
   a. the height of its crest
   b. the depth of its trough
   c. the way it travels through a medium
   d. the type of medium through which it travels
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8. The highest point of a wave above the rest position is the ___________ and the lowest point below the rest position is the ___________.

9. What is a transverse wave? ____________________________________________

10. Look at the figure below. Label the missing aspects of the wave in the rope.

   Direction of wave
   
   ___________
   ___________
   ___________

11. A wave in which the vibration of the medium is parallel to, or in the same direction as, the direction in which the wave travels is called a(n) ___________.

12. When a longitudinal wave carries energy through a spring, the area where the coils of a spring are closer together than they would be in the rest position is called a(n) ___________.

13. Is the following sentence true or false? A rarefaction is a region in a longitudinal wave where particles of a medium spread out.

   ___________

14. Why is an ocean wave classified as a surface wave? ____________________________________________

15. Why do ocean waves transport objects on the surface of the water as they approach shore? ____________________________________________

Match the type of wave to each description below. The type of wave may be used more than once.

<table>
<thead>
<tr>
<th>Description</th>
<th>Type of Wave</th>
</tr>
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<tbody>
<tr>
<td>16. P wave</td>
<td>a. transverse wave</td>
</tr>
<tr>
<td>17. Direction of travel is perpendicular to vibration direction</td>
<td>b. longitudinal wave</td>
</tr>
<tr>
<td>18. Rarefactions with particles that are spread out</td>
<td>c. surface wave</td>
</tr>
<tr>
<td>19. A wave that travels along a boundary separating two mediums</td>
<td></td>
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