Section 15.2 Energy Conversion and Conservation
(pages 453–459)
This section describes how energy is converted from one form to another and presents the law of conservation of energy.

Reading Strategy (page 453)
Relating Cause and Effect As you read, complete the flowchart to explain an energy conversion used by some gulls to obtain food. 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.

How Gulls Use Energy Conversions

1. Is the following sentence true or false? Energy can be converted from one form to another. ______________

2. When a wind-up toy is set in motion, elastic potential energy that was stored in a compressed spring is converted into the ______________ of the toy’s moving parts.

Conservation of Energy (page 455)
3. What does the law of conservation of energy state? ______________

4. A moving object slows down because friction causes a continual conversion of kinetic energy into ______________. Circle the correct answer.

   mechanical energy  potential energy  thermal energy
Chapter 15  Energy

Energy Conversions (pages 456–458)

5. As an object falls, the gravitational potential energy of the object is converted into ____________________.

6. At what point during a pole-vaulter’s jump is his gravitational potential energy the greatest? Circle the letter of the correct answer.
   a. when he leaves the ground
   b. at his greatest height
   c. when he hits the ground

7. Circle the letter of the type of energy that increases as the pole bends before it propels a pole-vaulter up into the air.
   a. kinetic energy
   b. mechanical energy
   c. elastic potential energy

8. Is the following sentence true or false? For a mechanical change in an isolated system, the mechanical energy at the beginning equals the mechanical energy at the end of the process, as long as friction is negligible. ________________

9. Tell whether the following situations illustrate kinetic energy, potential energy, or both.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Form of Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A stationary wind-up toy with a compressed spring</td>
<td></td>
</tr>
<tr>
<td>A descending roller coaster car</td>
<td></td>
</tr>
<tr>
<td>A skier poised to take off at the top of a hill</td>
<td></td>
</tr>
<tr>
<td>A car driving on a flat road</td>
<td></td>
</tr>
<tr>
<td>A vibrating guitar string</td>
<td></td>
</tr>
</tbody>
</table>

Energy and Mass (page 459)

10. Circle the letters of each correct sentence. What does Einstein’s equation imply about mass and energy?
    a. Mass and energy are equivalent.
    b. Mass and energy are never created.
    c. Mass and energy can be converted to each other.