Chapter 13  Forces in Fluids

Section 13.1 Fluid Pressure  
(pages 390–393)

This section defines pressure and describes factors that determine fluid pressure. The atmosphere as a fluid is discussed, including how air pressure changes with altitude.

Reading Strategy  
(page 390)

Using Prior Knowledge  
Before reading the section, write a common definition of the word pressure. After you have read the section, write the scientific definition of pressure and contrast it to your original definition. 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.

<table>
<thead>
<tr>
<th>Meanings of Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common definition</td>
</tr>
<tr>
<td>Scientific definition</td>
</tr>
</tbody>
</table>

Pressure  
(pages 390–391)

1. Pressure is the result of a(n) __________ distributed over a(n) __________.

2. The same force is exerted by each of the following. Which exerts the most pressure?
   a. a foot
   b. a large book
   c. the tip of a ballpoint pen

3. Circle the letter of the equation that shows how to calculate pressure.
   a. pressure = area/force
   b. pressure = force/area
   c. pressure = N/m²

Pressure in Fluids  
(pages 391–392)

4. A substance that assumes the shape of its container is called a(n) __________.

5. List three examples of fluids.
   a. __________
   b. __________
   c. __________
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6. Circle the letter of each sentence that is true about fluid pressure.
   a. Fluid pressure is exerted only at the base of the container holding the fluid.
   b. The pressure in a fluid at any given depth is constant, and it is exerted equally in all directions.
   c. The two factors that determine the pressure a fluid exerts are the type of fluid and its depth.

7. Is the following sentence true or false? The pressure at a depth of 2 feet in a large lake is greater than the pressure at the same depth in a swimming pool. _______________

Air Pressure and the Atmosphere (pages 392–393)

For questions 8 through 10, refer to the air pressure table below.

<table>
<thead>
<tr>
<th>Changes in Air Pressure With Altitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude Above Sea Level (m)</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>200</td>
</tr>
<tr>
<td>400</td>
</tr>
<tr>
<td>600</td>
</tr>
<tr>
<td>800</td>
</tr>
<tr>
<td>1000</td>
</tr>
<tr>
<td>1200</td>
</tr>
</tbody>
</table>

8. Complete the air pressure columns in the table by converting between units of air pressure. Hint: 1 bar = 101.3 kPa.

9. Does air pressure increase or decrease as a function of altitude? _______________

10. Suppose a hiker is on a mountain ridge 1200 meters above sea level. Approximately what air pressure will she experience? _______________

11. Is the following sentence true or false? Air exerts a force of more than 1000 N on top of your head. _______________