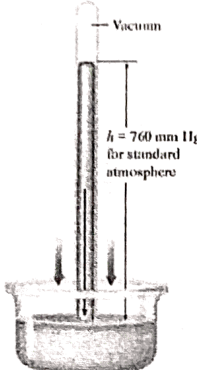


# AP Chemistry Unit 3 Problem Sets: Gases

## Problem Set 1: Properties of Gases - Pressure

1	2
<div style="text-align: center;">  </div> <p>2. Figure 5.2 shows a picture of a barometer. Which of the following statements is the best explanation of how this barometer works? Justify your answer.</p> <ol style="list-style-type: none"> <li>Air pressure outside the tube causes the mercury to move in the tube until the air pressure inside and outside the tube is equal.</li> <li>Air pressure inside the tube causes the mercury to move in the tube until the air pressure inside and outside the tube is equal.</li> <li>Air pressure outside the tube counterbalances the weight of the mercury in the tube.</li> <li>Capillary action of the mercury causes the mercury to go up the tube.</li> <li>The vacuum that is formed at the top of the tube holds up the mercury.</li> </ol>	<p>10.1 Mars has an average atmospheric pressure of 0.007 atm. Would it be easier or harder to drink from a straw on Mars than on Earth? Explain.</p>
3	4
<p>When you are in a plane flying at high altitudes, your ears experience pain. The discomfort can be temporarily relieved by yawning or swallowing some water. Explain.</p>	<p>38. A gauge on a compressed gas cylinder reads 2200 psi (pounds per square inch; 1 atm = 14.7 psi). Express this pressure in each of the following units.</p> <ol style="list-style-type: none"> <li>standard atmospheres</li> <li>megapascals (MPa)</li> <li>torr</li> </ol>
5	6
<p>37. Freon-12 (<math>\text{CF}_2\text{Cl}_2</math>) is commonly used as the refrigerant in central home air conditioners. The system is initially charged to a pressure of 4.8 atm. Express this pressure in each of the following units (1 atm = 14.7 psi).</p> <ol style="list-style-type: none"> <li>mm Hg</li> <li>torr</li> <li>Pa</li> <li>psi</li> </ol>	<p>10.21 In the United States, barometric pressures are generally reported in inches of mercury (in. Hg). On a beautiful summer day in Chicago the barometric pressure is 30.45 in. Hg. (a) Convert this pressure to torr. (b) A meteorologist explains the nice weather by referring to a "high-pressure area." In light of your answer to part (a), explain why this term makes sense.</p>