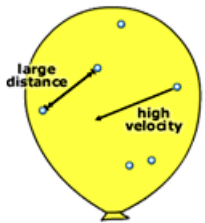
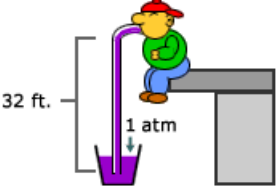
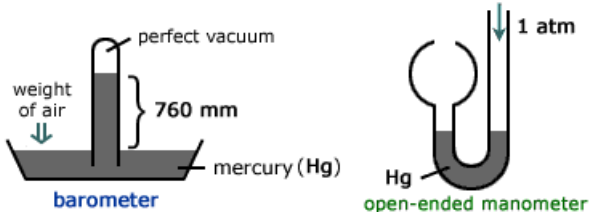


Properties of Gases

- The molecules of a **gas** are very far apart, have a high **velocity**, and fill up the space in which they are contained.
- Gases are quantified using **volume** and **pressure**.
- Pressure can be measured using a mercury **barometer** or an **open-ended manometer**.

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|  | <p>The molecules of a gas are very far apart. This makes gases very compressible.</p> <p>Unlike in solids and liquids, some of the molecules of a gas have a high velocity.</p> <p>The molecules of a gas fill up the space in which they are contained.</p> |
|  | <p>Gases are quantified using volume and pressure.</p> <p>Volume is measured in units of liters (L). $1 \text{ L} = 1000 \text{ cm}^3$.</p> <p>Pressure is force (F) per unit area (A). The force exerted by the atmosphere at sea level is 14.7 pounds per square inch (psi), or 1 atmosphere (atm).</p> <p>Against a perfect vacuum, 1 atm pressure can push a column of water up 32 feet. A lower pressure would push the column of water to a lower height. A denser liquid, such as mercury, has a lower maximum height.</p> |
|  | <p>Atmospheric pressure can be measured using a mercury barometer. At sea level, the mercury in the column will be pushed up 760 mm. This allows pressure to be measured in units of millimeters of mercury (mmHg), where $760 \text{ mmHg} = 1 \text{ atm}$. Another unit of pressure is the torr, where $1 \text{ torr} = 1 \text{ mmHg}$.</p> <p>The pressure of a gas sample can be measured using an open-ended manometer. The difference in height (in millimeters) between the mercury columns on the two sides of the manometer shows the difference in pressure from 760 mmHg (1 atm).</p> |