Pressure
(A Historical Perspective)

1564–1642: Galileo Galilei developed the suction pump. He used air to draw underground water up a column, similar to how a syringe draws water. He was perplexed as to why there was a limit to the height water could be raised.

1643: Evangelista Torricelli developed the first barometer. He carried on Galileo's work by determining that the limit to the height Galileo's pump could draw water was due to atmospheric pressure. He invented a closed-end tube filled with mercury that, in turn, was suspended in a shallow dish filled with liquid mercury. The height of the column of mercury in the tube (measured in mmHg) was equal to the atmospheric pressure acting on the mercury in the pan.

1643–1645: Otto von Guericke made a pump that could create a vacuum so strong that a team of 16 horses could not pull two metal hemispheres apart. He reasoned that the hemispheres were held together by the mechanical force of the atmospheric pressure rather than the vacuum. (Note: Point out to students that vacuums don't "suck"—it is the force of the atmosphere that pushes. This demonstration can be reproduced by forcing two bathroom plungers together and having students attempt to pull them apart.)

1648: Blaise Pascal used Torricelli's "barometer" and travelled up and down a mountain in southern France. He discovered that the pressure of the atmosphere increased as he moved down the mountain. Sometime later the SI unit of pressure, the Pascal, was named after him.

1661: Christiaan Huygens developed the manometer to study the elastic forces in gases.

1801: John Dalton stated that in a mixture of gases the total pressure is equal to the sum of the pressure of each gas, as if it were in a container alone. The pressure exerted by each gas is called its partial pressure.

1808: Joseph Louis Gay-Lussac observed the law of combining volumes. He noticed that, for example, two volumes of hydrogen combined with one volume of oxygen to form two volumes of water.

1811: Amadeo Avogadro suggested, from Gay-Lussac's experiments conducted three years earlier, that the pressure in a container is directly proportional to the number of particles in that container (known as Avogadro's Hypothesis). This can be illustrated by blowing up a balloon, ball, or tire: the more air is added the larger the container becomes due to increased pressure.