

GSC's products are intended for use in labs and classroom settings under the supervision of qualified professionals.

The products are not toys and are not intended for children under the age of 13.



Warning

The item contains small parts. This is not a toy – adult supervision required.

## 14013 Gas Law Demonstration

Gas Pressure is a measurement of the amount of force the moving gas particles cause on a unit of area. Several factors can affect the pressure of a gas. Increasing the temperature of a gas causes the particles to move faster. Faster moving particles can each exert a larger force when they collide with a surface. Increasing the temperature of a gas tends to increase its pressure. Confining a number of particles to a smaller volume causes them to move faster, which in turn increases the pressure they exert. Decreasing a gas's volume, then, tends to increase its pressure. The Combined Gas Law relates these three quantities in a way that is useful for solving and testing problems involving gases. If the amount of gas (number of particles) in a container is held constant, its pressure, volume and temperature are related as follows:

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$



Experiment:

- 1) Open the valve to the outside atmosphere.
- 2) Turn the piston so that the gasket is at a high volume.
- 3) Close the valve.
- 4) Record the initial volume, pressure and temperature in a data table.
- 5) Turn the piston clockwise to decrease the volume by at least 5ml. Wait a few seconds for the temperature reading to stabilize.
- 6) Record the new volume and pressure.

For each trial, calculate the relationship described in the Combined Gas Law PV/T.

You will be able to observe that the calculated relationship between the variables was constant for each trial. You may wish to experiment with increasing the volume from the starting value. Predict what will happen and test your idea.