

Phone: 417.347.7431  
Fax: 417.374.7442  
service@gosciencecrazy.com  
1747 North Deffer Drive  
Nixa, Missouri 65714



## Gas Law Deluxe with Pressure and Temperature Gauge #14013

### Warning:

- **Not a toy; use only in a laboratory or educational setting.**
- **California Proposition 65 Warning: This product can expose you to chemicals, including Nickel, Lead, DEHP, Latex, and Styrene, which are known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).**



### Introduction

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:

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



## How to Use

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.
7. 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.

