

Name(s): \_\_\_\_\_  
\_\_\_\_\_

Section: \_\_\_\_\_  
Date: \_\_\_\_\_

## **Gas Particles in Motion**

### **Activity 1: Changing Volume**

<http://sunshine.chpc.utah.edu/javalabs/>

#### **Getting Started : The Plunger Problem**

With your lab partner, make a prediction about why you think the plunger sticks to the wall .

Based on your prediction about why the plunger sticks to the wall, what do you predict will happen to the pressure of the gas when the volume is increased?

#### ***Lab Instructions***

1. Choose a temperature for your gas particles.
2. Select a volume for the box. The corresponding pressure will appear on the Pressure Gauge.
3. Record your data when you are satisfied with your choice of volume.
4. You should select six to eight different volumes before you change to a new temperature. Copy your data from the screen into your notebook before choosing a new temperature. *Selecting a new temperature will clear your data!*
5. After completing 2 different experiments (2 different temperatures) move on to the analysis questions.



### ***Analysis Questions***

1. Study the data you have just collected from your two or three trials. Describe the relationship between pressure of a gas and its volume.
2. Does changing the temperature at which you do your experiment effect the relationship between pressure and volume? If yes, explain how.
3. After reviewing the data from your experiments, explain the relationship between pressure and volume.
4. Now, relate your explanation to the plunger problem and explain how the plunger sticks to the wall.

### ***Graphing Activities***

1. Create a graph for each set of data. When you're finished, compare it to the one in the computer lab.
2. Does the general shape of your graphs stay the same?
3. What conclusion can you make by comparing your different graphs?
4. Label the third column on your data tables  $P \times V$ .
5. Multiply all the pairs of pressure and volume values and put them in your new column.
6. What do you notice about all of the products you have just created?
7. Check with your classmates on their results. How are they the same? How are they different? Can you explain the differences?

## ***Historical Science***

Use the ASPIRE biography to learn about Robert Boyle, the scientist who discovered the gas law you just learned.

To find the biography, bring up the ASPIRE website - <http://sunshine.chpc.utah.edu/>  
Go to *Interactive Labs*, and follow the path to *Gas Laws Activity One*. In the *Student Lab*, scroll down until you reach the *History* section, then click on the link for Robert Boyle.

Below list at least 4 ideas you found most interesting or important about Boyle.

1.

2.

3.

4.