Name: ______________________  

Exploring Gases

Objective
You will observe and describe the relationships between temperature, volume, and pressure in the following lab stations.

Safety
- Always wear safety goggles when handling chemicals in the lab.
- Wash your hands thoroughly before leaving the lab.
- Follow the teacher’s instructions for cleanup of materials and disposal of chemicals.
- Always use caution around open flames. Keep flames away from flammable substances.
- Always be aware of an open flame. Do not reach over it, tie hair back, and secure loose clothing.
- Open flames can cause burns.
- Food in the lab should be considered a chemical not for consumption.

Lab Station 1: Crush the Can

Materials
- Bunsen Burner
- Empty Soda Can
- Large Beaker filled with ice water
- Tongs

Procedure
1. Put a small splash of water in the empty soda can.
2. Carefully light the Bunsen burner.
3. Holding the can with tongs, heat the can over the flame until you see steam rising out of it and can hear the water boiling.
4. Very quickly, invert (turn the can upside down) into the ice water.
5. Turn off the Bunsen Burner,
6. Using the tongs, pour out any water from the soda can and place the can in the recycling bin.
7. Complete the data table for this station.

Lab Station 2: Marshmallow and Syringe

Materials
- Small marshmallow
- Syringe

Procedure
1. Open the syringe.
2. Place the marshmallow into the syringe.
3. Close the syringe.
4. Place your finger over the tip of the syringe.
5. Push down and pull back on the syringe.
6. Remove your finger, open the syringe and put the marshmallow in the trash can.
7. Complete the data table for this station.

**Lab Station 3: Empty Bottle**

**Materials**
- Empty Soda Bottle
- Temperature Strip inside of the bottle
- Pump Cap

**Procedure**
1. Observe the temperature strip inside the bottle.
2. Connect the pump cap to the bottle opening.
3. Push the knob several times and again observe the temperature strip.
4. Remove the cap and observe the strip.
5. Complete the data table for this station.

**Data**

<table>
<thead>
<tr>
<th>Station</th>
<th>Observations</th>
<th>Variables that changed (V, T, P)</th>
<th>Unit for each variable involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Analysis**
Use the following information to graph each set of data. Be careful to place the correct variable on the correct axis.

<table>
<thead>
<tr>
<th>Volume (mL)</th>
<th>Pressure (Torr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>750</td>
</tr>
<tr>
<td>20</td>
<td>400</td>
</tr>
<tr>
<td>30</td>
<td>250</td>
</tr>
<tr>
<td>40</td>
<td>200</td>
</tr>
</tbody>
</table>

1. What variable is on the x-axis?
2. What variable is on the y-axis?
3. What type of relationship do the 2 variables have?
4. Which station relates to this lab?
5. Why did you choose that station?
Graph 2

<table>
<thead>
<tr>
<th>Volume (mL)</th>
<th>Temperature (K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>275</td>
</tr>
<tr>
<td>45</td>
<td>300</td>
</tr>
<tr>
<td>48</td>
<td>325</td>
</tr>
<tr>
<td>52</td>
<td>350</td>
</tr>
</tbody>
</table>

1. What variable is on the x-axis?
2. What variable is on the y-axis?
3. What type of relationship do the 2 variables have?
4. Which station relates to this lab?
5. Why did you choose that station?
Graph 3

<table>
<thead>
<tr>
<th>Temperature (K)</th>
<th>Pressure (Torr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>700</td>
</tr>
<tr>
<td>275</td>
<td>750</td>
</tr>
<tr>
<td>300</td>
<td>850</td>
</tr>
<tr>
<td>375</td>
<td>1050</td>
</tr>
</tbody>
</table>

1. What variable is on the x-axis?
2. What variable is on the y-axis?
3. What type of relationship do the 2 variables have?
4. Which station relates to this lab?
5. Why did you choose that station?
Conclusion
1. Write a summary about what you learned in this lab.

2. Explain why you ears pop when you take off on an air plane.

3. Explain why a soda can would explode if you left it in your car on a hot summer day.

4. Explain why your tires might appear to look flat in the winter but not in the summer.