

Gas Activity	Juan Betancourt
Chem 100	Spring 2005 1 of 6

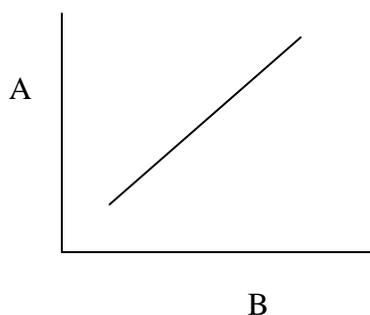
Name: \_\_\_\_\_

### Lab: Gas relationships

Variables that describe a Gas

Variable name	Variable	units
Pressure	P	Kilopascals
Volume	V	Liters
Temperature	T	Kelvins
# of moles	N	moles

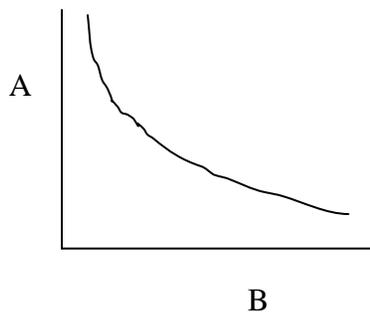
Proportions type



Directly Proportional

$$A = k(B)$$

k: constant



Indirectly Proportional

$$A = k/(B)$$

k: constant

Using internet explorer go to the following address:

<http://intro.chem.okstate.edu/1314F00/laboratory/glp.htm>

After the instructor describes how to use the interface, work on the following relationships involving gases

### Pressure and volume relationships

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Problem Statement: How are the pressure and volume of a gas sample related?

1. Select volume as your “y” axis and pressure as your “x” axis
2. Using the bars for the two variables and changing one variable ,in the control bar region, fill in the table for two different values of Pressure

Pressure	volume	1/Volume

3. Draw the shape of the graph created. Don’t forget to label your axis.



Repeat the same for pressure in the “y” axis” and 1/volume in the “x” axis



3. What is the relationship between pressure and volume? \_\_\_\_\_  
 What is the relationship between pressure and 1/volume)? \_\_\_\_\_

4. What happens to the pressure as the volume increases?

\_\_\_\_\_

5. What happens to the pressure as the 1/volume increases?

\_\_\_\_\_

6. Look at your data , are your answers to 1 and 2 what you see in the data you collected in the table above?

\_\_\_\_\_

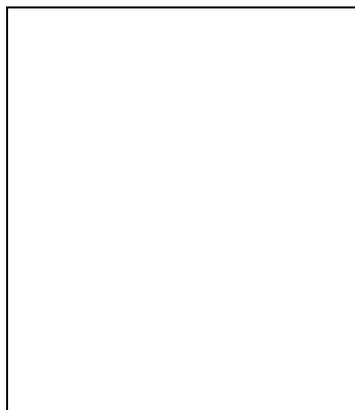
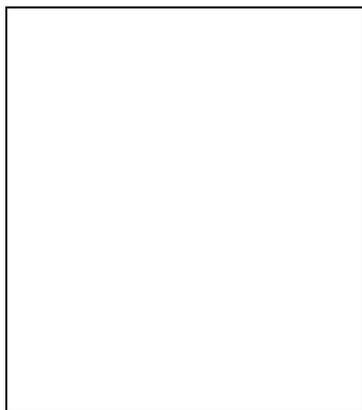
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7. Using the equation of an indirect equation substitute A and B for P and V and

write down how your equation looks like. \_\_\_\_\_ . Do the same for P and 1/V. \_\_\_\_\_

8. Do you see any pattern in the data?

9. Mental Model - Draw a picture(s) that explains how the pressure and volume of a gas sample are related at the level of atoms and molecules, and that illustrates the observations you made in the experiment. In words, explain how your picture(s) illustrate(s) this relationship



### Volume and Temperature

1. Select volume as your “y” axis and temperature as your “x” axis
2. Using the bars for the two variables selected, fill in the table for two different values of volume

Volume	temperature

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3. Draw the shape of the graph created. Don't forget to label your axis.



4. What is the relationship between temperature and volume?  
\_\_\_\_\_

5. What happens to the temperature as the volume increases?  
\_\_\_\_\_

6. What happens to the volume as the temperature decreases?  
\_\_\_\_\_

7. Look at your data, are your answers to 1 and 2 what you see in the data you collected in the table above?  
\_\_\_\_\_

8. Using the equation of a direct equation substitute A and B for V and T and

write down how your equation looks like. \_\_\_\_\_

5. If you extend the line of the graph to  $x=0$  where does the line intercept the "y" axis?

at  $y=$ \_\_\_\_\_

**Pressure and temperature**

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4. Select pressure as your “y” axis and temperature as your “x” axis
5. Using the bars for the two variables selected, fill in the table for two different values of pressure

Pressure	Temperature

6. Draw the shape of the graph created by changing the values of pressure and temperature. Don't forget to label your axis.



1. What is the relationship between temperature and pressure?

\_\_\_\_\_

2. What happens to the temperature as the pressure increases?

\_\_\_\_\_

3. What happens to the pressure as the temperature decreases?

\_\_\_\_\_

4. Look at your data, are your answers to 1 and 2 what you see in the data you collected in the table above?

\_\_\_\_\_

6. Using the equation of a direct equation substitute A and B for P and T and write down how your equation looks like. \_\_\_\_\_

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### Volume and moles

7. Select volume as your “y” axis and moles as your “x” axis
8. Using the bars for the two variables selected, fill in the table for two different values of volume

Volume	moles

9. Draw the shape of the graph created by changing the values of volume and moles. Don't forget to label your axis.



1. What is the relationship between moles and volume? \_\_\_\_\_

2. What happens to the number of moles as the volume increases?

\_\_\_\_\_

3. What happens to the volume as the number of moles decreases?

\_\_\_\_\_

4. Look at your data, are your answers to questions 1 and 2 what you see in the data collected in the table above?

\_\_\_\_\_

7. Using the equation of a direct equation substitute A and B for n and V and

write down how your equation looks like. \_\_\_\_\_