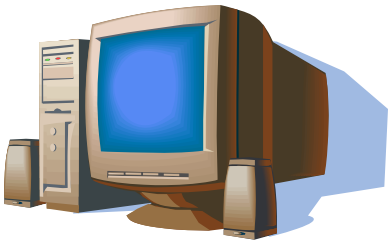
Name _____ AP Chemistry
Boyle's Law lab

Introduction: Boyle's Law states that pressure varies inversely with volume for an ideal gas in a closed system. You will provide evidence for this Law in this lab using a syringe and computer devices.

Equipment:



- Computer and Pasco Interface
- Pasco Computer Software
- Syringe
- Graph Paper and pencil

Set-up:

1. Turn the interface on (green light should be on) – make sure Sensor is attached
2. Log on to the computer and launch the Datastudio program (icon on desktop)
3. Click on Create Experiment
4. Double Click Pressure Sensor (absolute) – it should be added to Interface
5. Double click on table (located on right side of screen)
6. Disconnect the syringe and set the volume to 20.0 ml and then re-attach the syringe
7. You are now ready to begin

Procedure:

1. When everything is ready, start recording data (click Start)
2. Record the pressure at 20.0 ml to a value of 0.1
3. Move the piston to 19 ml and record the pressure.
4. Continue moving the piston to a new position (every 1.0 ml) and recording the pressure
5. After you record the pressure for the last volume, click STOP
6. Repeat the procedure 2 more times and record your data in the tables

Trial #1

Volume (mL)	Pressure (kPa)
20 mL	
19 mL	
18 mL	
17 mL	
16 mL	
15 mL	
14 mL	
13 mL	
12 mL	
11 mL	
10 mL	
9 mL	
8 mL	
7 mL	
6 mL	
5 mL	

Trial #2

Volume (mL)	Pressure (kPa)
20 mL	
19 mL	
18 mL	
17 mL	
16 mL	
15 mL	
14 mL	
13 mL	
12 mL	
11 mL	
10 mL	
9 mL	
8 mL	
7 mL	
6 mL	
5 mL	

Trial #3

Volume (mL)	Pressure (kPa)
20 mL	
19 mL	
18 mL	
17 mL	
16 mL	
15 mL	
14 mL	
13 mL	
12 mL	
11 mL	
10 mL	
9 mL	
8 mL	
7 mL	
6 mL	
5 mL	

********** Do Not go past 5 mL **********

Lab Report:

1. Graph Volume vs. Pressure for each of the above experiments using different colors for each trial. Make sure to label your axes and give the graph a title. Connect the data points. Attach the graphs to this lab.

2. What happens to the pressure in a container of air as its volume is changed while the temperature remains constant?

---

3. From looking at your data, do pressure and volume seem to be directly or are they inversely proportional? Does this agree with Boyle's Law?

4. What happened to the pressure when the volume went from 20 ml to 10 ml?

5. The diagram below shows a piston confining a gas in a cylinder.

The gas volume in the cylinder is 6.2 milliliters and its pressure is 1.4 atmospheres. The piston is then pushed in until the gas volume is 3.1 milliliters while the temperature remains constant. Calculate the pressure, in atmospheres, after the change in volume. [*Show all work.*]