

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

Period: \_\_\_\_\_

Seat#: \_\_\_\_\_

**Directions:**

**Carefully follow the procedures for each activity.** This will include drawing a model of each apparatus before and after the activity and then answering the corresponding questions. Your drawings/diagrams should have:

- Clear and carefully made pictures of what is happening. You don't have to be an artist, but your work must be neat. Only include relevant information.
- Representations of the molecules of gas
- Labels for the appropriate gas quantities (pressure, volume, amount, temperature, etc.)

***Keep in mind it is not enough to merely describe what is happening (i.e. an observations), you must EXPLAIN what is happening and why!***

**Activity #1: Soda Can Activity**

1. Using a graduated cylinder, measure and then pour 20ml of water into a soda can.
2. Place the can on the hot plate, turn the heat up, let it sit until the water is boiling (water vapor is coming out, and you can hear it rumbling inside the can).
3. Using tongs – quickly take the can off the hot plate and put it upside down into the cold water (so top of can is sealed with water). **BE VERY CAREFUL NOT TO TOUCH THE CAN OR HOT PLATE!!!**

<b>BEFORE:</b>	<b>AFTER:</b>
***Draw pictures of before and after making sure to show what the molecules are doing***	

What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).

### Activity #2: Cartesian Diver

Observe the apparatus and sketch a diagram. Using your hand, gently squeeze the bottle and record your observations.

**DO NOT PICK UP THE BOTTLE, OR TURN THE BOTTLE UPSIDE DOWN.**

Hint: look closely at the air bubble inside the diver!

<b>BEFORE:</b>	<b>AFTER:</b>
***Draw pictures of before and after making sure to show what the molecules are doing with arrows for pressure***	
What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).	

### Activity #3: Marshmallow Madness

Place a marshmallow into the syringe and replace the plunger. Close the stopcock, then push on the plunger and record your observations. **Do NOT BREAK THE SYRINGES PLEASE!!!!**

<b>BEFORE:</b>	<b>AFTER:</b>
***Draw pictures of before and after making sure to show what the molecules are doing with arrows for pressure***	
What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).	

### Activity #4: Fizz keeper

Place the fizz keeper on top of a 2L bottle with a thermometer inside. Record the initial temperature. Pump the fizz keeper until you see a change on the thermometer. **STOP ONCE YOU SEE A TEMPERATURE CHANGE! DO NOT KEEP GOING! BE VERY CAREFUL NOT TO POINT THE PRESSURIZED BOTTLE AT YOUR FACE OR ANYONE ELSE.** Record the new temperature. Release the pressure, leave the bottle open for the next group.

<b>BEFORE:</b>	<b>AFTER:</b>
***Draw pictures of before and after making sure to show what the molecules are doing***	

What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).

### Activity #5: Candlelight

Fill the bottom of the pie pan with water. Light the candle carefully with the matches. Place the graduated cylinder upside down on top of the candle. **DO NOT PUT USED MATCHES IN THE TRASH! GET THEM WET BEFORE YOU PUT THEM IN THE TRASH!** Wash any soot off the cylinder.

<b>BEFORE:</b>	<b>AFTER:</b>

What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).

**Activity #6: Alka Seltzer**

Fill an Erlenmeyer flask to the top with tap water. Obtain an Alka Seltzer tablet and **GENTLY** crush with the mortar and pestle. Get a large, round balloon and place the tablet powder inside. Then carefully attach the balloon to the flask (balloon hangs to side). **SOMEONE NEEDS TO HOLD THE FLASK WHILE SOMEONE ELSE PUTS THE BALLON ON SO THE FLASK DOESN'T TIP OVER AND BREAK!** Place the balloon upright to start the reaction. After all bubbling stops, place the system on the electronic balance. Record this mass. Grab the top of the balloon and flatten a small section. Make a small cut in the balloon and slowly release the gas. Record the new mass. Be sure that no water leaves the balance. Record the room temperature and pressure.

Data	Before
1. Mass of system before releasing gas:	***Draw a picture making sure to show what the molecules are doing***
2. Mass of system after puncturing balloon:	
3. Mass of gas (subtract 1 from 2 above):	
	After
	***Draw a picture making sure to show what the molecules are doing***
4. Room temperature (in Kelvin):	
5. Atmospheric Pressure (in mm Hg):	

The pressure inside the balloon is equal to atmospheric pressure, which includes both CO<sub>2</sub> and water vapor. Find the value for water vapor at this temperature and subtract this from atmospheric pressure. You now have the pressure of your gas. Convert this to atmospheres:

What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).

### Activities #7-9

We are not able to do these in class. Please watch the videos so you can still witness the activity!  
Scan the QR codes and watch the corresponding video. Draw a diagram of the before and after.

#7



<https://tinyurl.com/yblcd4pt>

#8



<https://tinyurl.com/nj7w9uy>

#9



<https://tinyurl.com/y7st9789>

### Activity #7: Egg in a Bottle

Scan the QR code and watch the corresponding video. Draw a diagram of the before and after.

<b>BEFORE:</b>	<b>AFTER:</b>
<p>What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).</p>	

### Activity #8 Balloon in Liquid Nitrogen

Scan the QR code and watch the corresponding video. Draw a diagram of the before and after.

<b>BEFORE:</b>	<b>AFTER:</b>
<p>What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).</p>	

### Activity #9 Jousting Peeps

Scan the QR code and watch the corresponding video. Draw a diagram of the before and after.

<b>BEFORE:</b>	<b>AFTER:</b>
<p>What gas law is demonstrated by this activity? Explain what happened in terms of gas molecules and the appropriate gas characteristics (pressure, temperature, volume, amount).</p>	