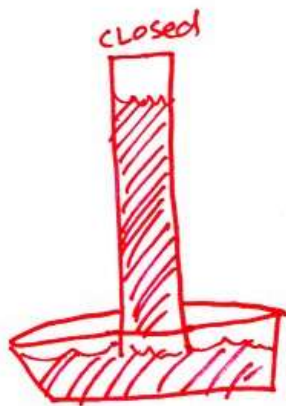


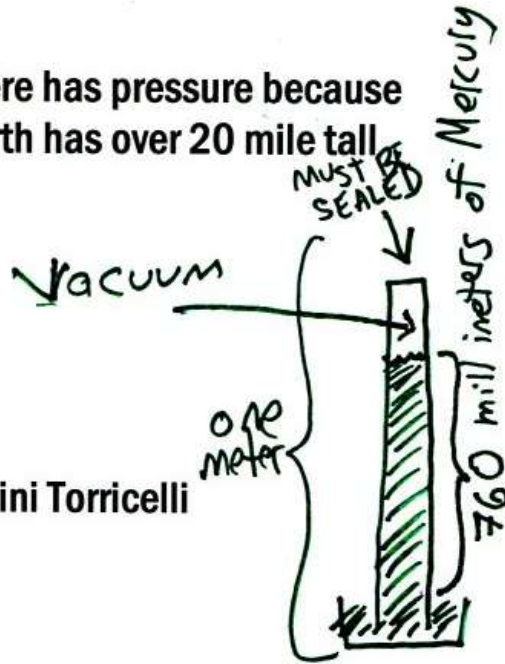
Purpose:

Why will this barometer work and this one not work?

WARMUP, draw these:



#1 The atmosphere has pressure because everywhere on earth has over 20 mile tall pile of air over it



#2 Barometer
invented by Antonini Torricelli

Pressure at Sea Level is exactly
enough to hold up
760 millimeters of
Mercury

#3 There are five common pressure units

$$101300 \text{ pascals} = 760. \text{ mmHg}$$

$$101.3 \text{ kilopascals} = 760. \text{ mmHg}$$

$$1.000 \text{ atmosphere} = 760. \text{ mmHg}$$

$$760. \text{ torr} = 760 \text{ mmHg}$$

STP standard
temperature
and
pressure
is

0°C and 1.00 atm

#4 How to convert between pressure units.

Convert 750 torr to "atm"

$$750 \text{ torr} \times \left(\frac{760 \text{ mmHg}}{760 \text{ torr}} \right) \left(\frac{1 \text{ atm}}{760 \text{ mmHg}} \right) = \text{atm}$$

Answer: 0.987_{atm}

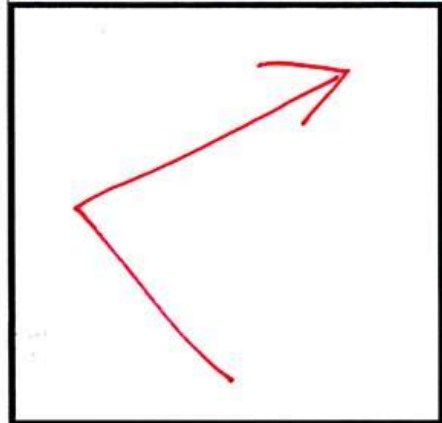
#5 glue in

#6 vacuum demo

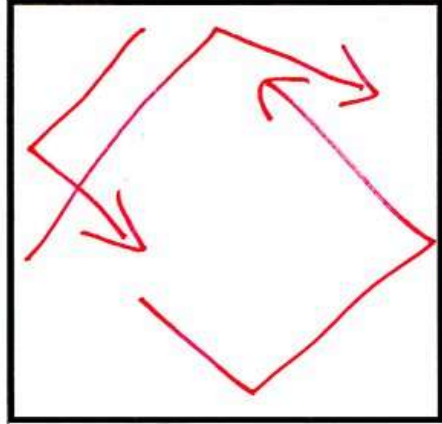
Avogadro's Law (LAB DATA)



1. Draw one molecule into Box A and three molecules into Box B, as skinny as possible.
2. Cut four strips of colored paper, as skinny as possible.
3. Draw tiny arrows all over both sides of each strip, all going toward the same end of the paper.
4. Hold the tip of your strip to your molecule in Box A. Now use the paper to show the path your gas particle could move. Fold, hit, bend, hit, bend, hit...
5. Tape or glue your paper to the box



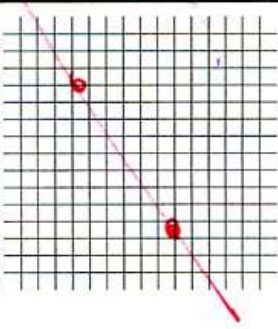
Box A. In here there is one gas molecule at 200 kelvins. It bounces off the walls 4 times.



Box B. In here there are three gas molecules at 200 kelvins. They bounce off the walls 12 times.

6. Make a little table:	
# of molecules	# of wall hits
1	4
3	12

7. Make a graph for your table (label your axes)



8. When the gas collides with the wall of the box it causes pressure. Based on the number of hits, pressure seems to be (directly / inversely) related to number of gas molecules.

9. How would you do steps #1 - #5 differently if you were trying to show a colder gas or a hotter gas?

Cold gas moves less far.

10. Complete the sentence. "When the number of molecules goes up by three, the pressure on the walls goes up by ..." *three*

This is class notes. Tape, glue or staple it into your notebook at the first opportunity!

Givens:
The sphere is motionless.
The left person is pushing with 40 torr of pressure



40 torr

??

40 torr!

Find:
The push from the right person.

Givens:
The sphere is motionless.
Two of the people have their pressure shown.



80 torr

??

50 torr

Find:
The push from the unmarked person.

Givens:
The sphere is motionless.
Two of the pressures are shown



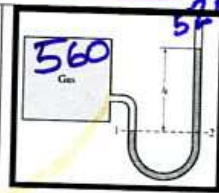
16 torr

5 torr

?? 21 torr

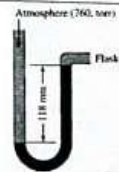
Find:
The push from the unmarked fan.

Givens:
The liquid mercury is motionless.
The gas in the box is 560 mmHg
The ambient pressure is 520 mmHg.



Find:
The pressure, in mmHg, of the liquid marked "h"
 $560 = 520 + H$
 $H = 40 \text{ mmHg}$

Givens:
The liquid mercury is motionless.
The pressure from the raised liquid mercury is 118 mmHg.
The ambient pressure is 760 torr (760 mmHg).



Find:
The pressure from the flask.

$760 = 118 + \text{flask}$
 $\text{flask} = 642 \text{ torr}$