

BETWEEN THE TRUTH AND A LIE!

East.H.S. CHEMistry

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Name _____

Date _____

Come for assistance and cheerful encouragement after school Tues, Thurs, or every day at lunch

Here are a bunch of helpful numbers and figures

0 degrees C = 273 kelvins

760. torr = 760. mmHg = 1.00 atm = 101.3 kPa = 101,300 pascals

Unit conversion.

Convert each of these by writing a starter number, a goal unit, and the numbers in a relationship.

1. If the pressure during a Mexican Hurricane was 797 mmHg, what would the pressure be in kPa?

$$797 \text{ mmHg} \times \left(\frac{101.3 \text{ kPa}}{760 \text{ mmHg}} \right) = 106 \text{ kPa}$$

2. If the pressure of a bike tire was 7.6×10^6 pascals, what would the pressure be in atm?

$$7.6 \times 10^6 \text{ Pa} \times \left(\frac{1.00 \text{ atm}}{101300 \text{ Pa}} \right) = 75 \text{ atm}$$

3. In a container of gas, when temperature increases pressure usually (decreases / increases).
4. In a container of gas, when number of particles increases pressure usually (decreases / increases).
5. In a container of gas, when volume increases pressure usually (decreases / increases).
6. Which of these units are suitable for solving gas math problems?

a. kelvins are (suitable / not suitable)

b. degrees celsius are (suitable / not suitable)

7. Read the problem below and then check one box

pressure will decrease

pressure will increase

A tiny steel tank of gas contains 5,000 atoms of krypton at 611.1 kPa pressure. If more krypton atoms are added until there are 7,000 atoms in the balloon what will be the final pressure?

Only one of these is correct. Only calculate the answer for that one

$$611.1 \text{ kPa} \times \left(\frac{5000 \text{ atoms}}{7000 \text{ atoms}} \right) =$$

$$611.1 \text{ kPa} \times \left(\frac{7000 \text{ atoms}}{5000 \text{ atoms}} \right) = 900 \text{ kPa}$$

8. Read the problem below and then check one box

- volume will decrease
 volume will increase

A copper container has a volume of 555 mL and is filled with air at 298K. The container is immersed in a dry ice bath at 202K. What will be the final volume?

Only one of these is correct. Only calculate the answer for that one

$$555 \text{ mL} \times \left(\frac{202 \text{ K}}{298 \text{ K}} \right) = 376 \text{ mL}$$

~~$$555 \text{ mL} \times \left(\frac{298 \text{ K}}{202 \text{ K}} \right) =$$~~

9. Read the problem below and then check one box

- pressure will decrease
 pressure will increase

A sample of ethane gas has a volume of 125 mL at 725 torr. If the volume is changed to 100 mL what will be the new pressure?

Only one of these is correct. Only calculate the answer for that one

~~$$725 \text{ torr} \times \left(\frac{100 \text{ mL}}{125 \text{ mL}} \right) =$$~~

$$725 \text{ torr} \times \left(\frac{125 \text{ mL}}{100 \text{ mL}} \right) = 900 \text{ torr}$$

10. Read the problem below and then check one box

- pressure will decrease
 pressure will increase

If air at Standard Pressure in a steel cylinder is compressed from 30.0 L to 4.40 L, and temperature remains constant, what will be the new gas pressure inside the cylinder?

Only one of these is correct. Only calculate the answer for that one

~~$$1.00 \text{ atm} \times \left(\frac{4.40 \text{ L}}{30.0 \text{ L}} \right) = \textcircled{1}$$~~

$$1.00 \text{ atm} \times \left(\frac{30.0 \text{ L}}{4.40 \text{ L}} \right) = \textcircled{2} 6.82 \text{ atm}$$

Unit conversion. Convert each of these by writing a starter number, a goal unit, and the numbers in a relationship.

If the pressure outside of a submarine was 11.4 atm, what would the pressure be in torr?

$$11.4 \text{ atm} \times \left(\frac{760 \text{ torr}}{1.00 \text{ atm}} \right) = 8660 \text{ torr}$$

If the pressure outside on an exoplanet was 66.5 pascals, what would the pressure be in atm?

$$66.5 \text{ Pa} \times \left(\frac{1.00 \text{ atm}}{101300 \text{ Pa}} \right) = 6.56 \times 10^{-4} \text{ atm}$$

11. Read the problem below and then check one box

- volume will decrease
 volume will increase

What volume will 250. mL of gas at STP occupy if the pressure changes to 4.00 atmospheres?

Only one of these is correct. Only calculate the answer for that one

$$250 \text{ mL} \times \left(\frac{1.00 \text{ atm}}{4.00 \text{ atm}} \right) = 62.5 \text{ mL}$$

~~$$250 \text{ mL} \times \left(\frac{4.00 \text{ atm}}{1.00 \text{ atm}} \right) =$$~~

12. Read the problem below and then check one box

volume will decrease
 volume will increase

See below

What volume will 250. mL of gas at STP occupy if the temperature changes to 30°C and pressure to 3.30 atm?

Hotter temperature says volume should increase
BUT
 Higher pressure says volume should decrease

Only one of these is correct. Only calculate the answer for that one

$$250. \text{ mL} \times \left(\frac{0^\circ \text{C}}{30^\circ \text{C}} \right) \times \left(\frac{3.30 \text{ atm}}{1.00 \text{ atm}} \right) =$$

$$250. \text{ mL} \times \left(\frac{30^\circ \text{C}}{0^\circ \text{C}} \right) \times \left(\frac{1.00 \text{ atm}}{3.30 \text{ atm}} \right) =$$

$$250. \text{ mL} \times \left(\frac{303 \text{ K}}{273 \text{ K}} \right) \times \left(\frac{1.00 \text{ atm}}{3.30 \text{ atm}} \right) = 84.1 \text{ mL}$$

13. Read the problem below and then check one box

pressure will decrease
 pressure will increase

A sample of carbon dioxide occupies a volume of 3.50 liters at 125 kPa pressure. What pressure would the gas exert if the volume was decreases to 2.00 liters?

Only one of these is correct. Only calculate the answer for that one

~~$$125 \text{ kPa} \times \left(\frac{2.00 \text{ L}}{3.50 \text{ L}} \right) =$$~~

$$125 \text{ kPa} \times \left(\frac{3.50 \text{ L}}{2.00 \text{ L}} \right) = 219 \text{ kPa}$$

14. Read the problem below and then check one box

~~NOISE~~ will decrease
 ~~NOISE~~ will increase

A 2.0 liter container of nitrogen has a pressure of 3.2 atm. What volume would be necessary to decrease the pressure to Standard Pressure?

Set up and solve.

$$2.0 \text{ L} \times \left(\frac{3.2 \text{ ATM}}{1.0 \text{ ATM}} \right) = 6.4 \text{ L}$$

15. Read the problem below and then check one box

volume will decrease
 volume will increase

A sample of nitrogen occupies a volume of 250. mL at 95°C. What volume will it occupy at 0°C? Be careful of your temperature units!

Set up and solve.

$$250 \text{ mL} \left(\frac{273 \text{ K}}{368 \text{ K}} \right) = 185 \text{ mL}$$

273K 368K

PURPOSE: WHAT IS
AVOGADRO'S PRINCIPLE?

#1 EQUAL VOLUMES
OF GAS ALL HAVE
THE SAME NUMBER
OF PARTICLES.



ALL
three
have
the
same
particle
quantity

~~at same
pressure~~
If at STP

#2 AVOGADRO'S NUMBER

IS

$$6.02 \times 10^{23}$$

memorize
this

Honest TODAY

① Team Lift. Work
in pairs. AT BACK
STATIONS.

② Homework Check

③ Notebook (short!)

④ Do 2 problems
in tonight's
'Laundry Basket'