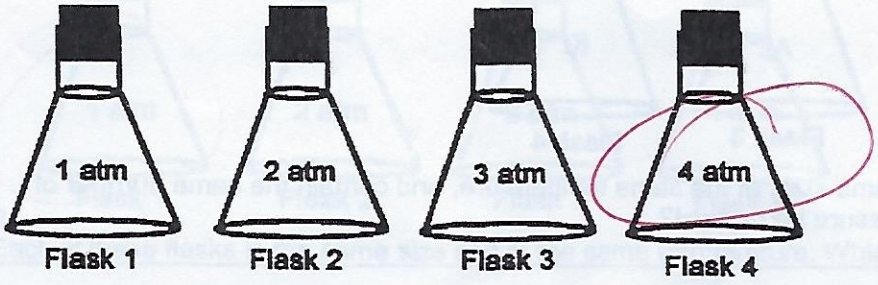
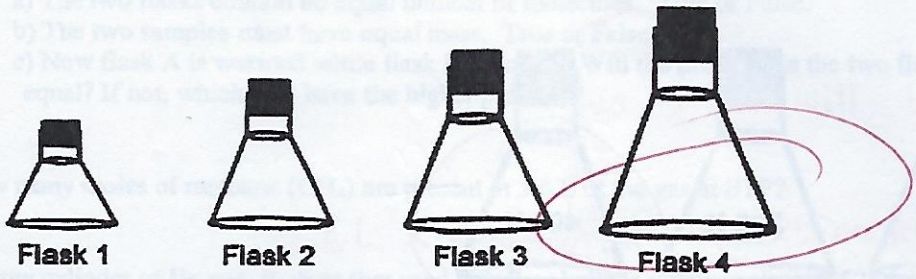
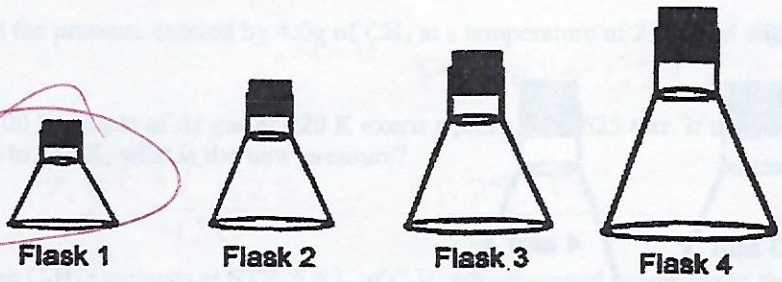
Gases Review Worksheet #1



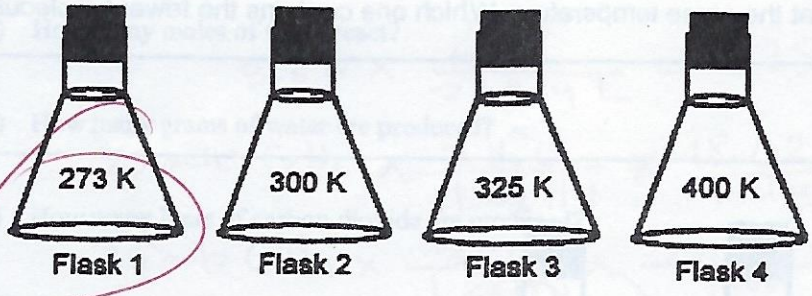
1. Each of these flasks is the same size and at the same temperature. Which one contains the most molecules?



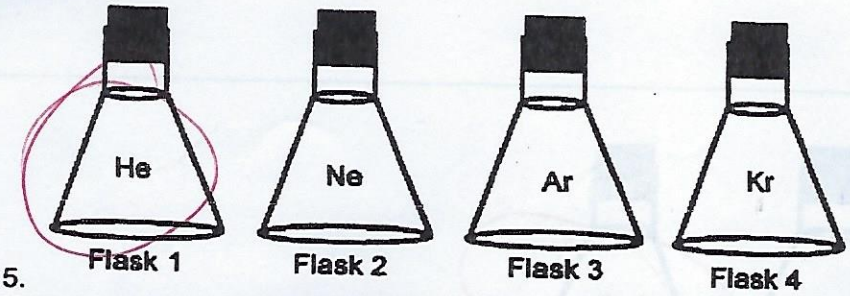
2. Each of these flasks contains the same number of molecules. In which container is the pressure lowest?



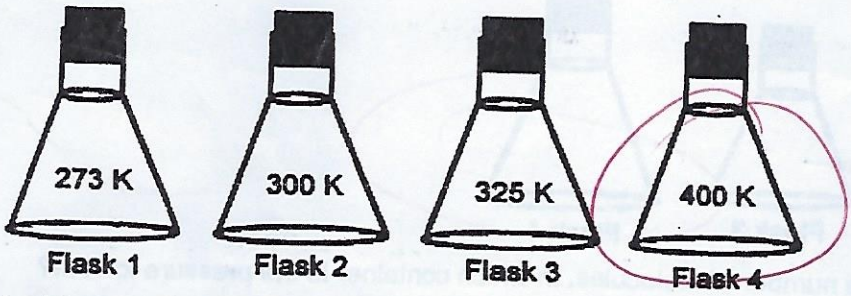
3. Each of these flasks contains the same number of molecules. In which container is the pressure highest?



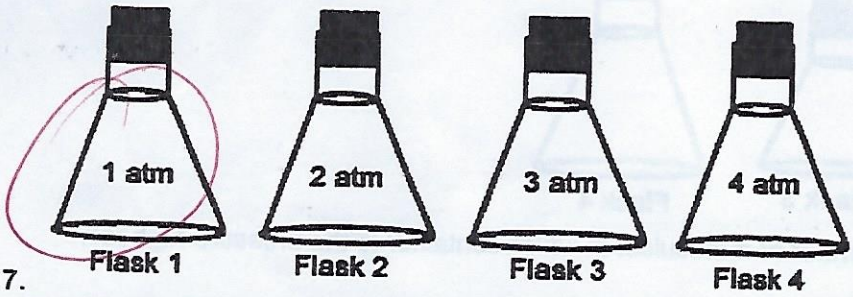
4. Each of these flasks contains the same number of gas molecules. In which would the pressure be lowest?



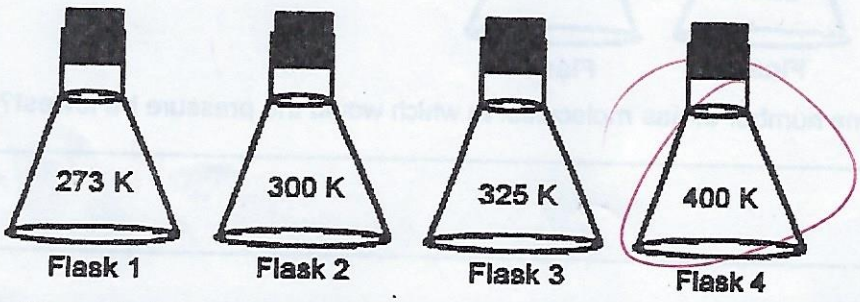
5. If all of the following flasks are the same size, at the same temperature, and contain the same number of molecules, in which flask will the pressure be highest?



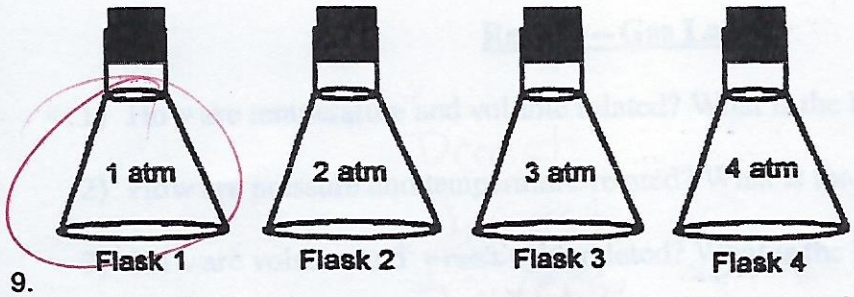
6. Each of these flasks contains the same number of gas molecules. In which would the pressure be highest?



7. Each of these flasks is the same size and at the same temperature. Which one contains the fewest molecules?



8. Each of these flasks contains the same number of gas molecules. In which would the pressure be highest?



9. Each of these flasks is the same size and at the same temperature. Which one contains the fewest molecules?

10. Two sealed flasks of equal volume, A and B, contain two different gases at the same temperature and pressure.
   a) The two flasks contain an equal number of molecules. True or False.
   b) The two samples must have equal mass. True or False.
   c) Now flask A is warmed while flask B is cooled. Will the pressure in the two flasks remain equal? If not, which will have the higher pressure? no > A will be higher

11. How many moles of methane (CH_4) are present in 5.6 L of the gas at STP?

$$5.6\,L \times \frac{mole}{22.414\,L} = .25\,mole$$

12. A large cylinder of He gas, such as that used to inflate balloons, has a volume of 25.0 Lat 22°C and 5.6 atm. How many moles of He are in the cylinder? $(5.6)(25) = n(.0821)(295)$ 5.8 mole

13. Find the pressure exerted by 4.0g of CH_4 at a temperature of 27°C and with a volume of 3000 mL.

.24 mole $P(3.0) = (.24)(.0821)(300)$ $P = 2.05$ atm

14. A 7.00 L sample of Ar gas at 420 K exerts a pressure of 625 torr. If the gas is compressed to 1.25 L and the temperature is lowered to 350 K, what is the new pressure?

$$\frac{(7.00)(625)}{420} = \frac{(1.25)P_2}{350} \qquad P_2 = 2917\,torr$$

15. When C_3H_4 combusts at STP, 5.6 L of C_3H_4 are consumed according to the following equation:

$$C_3H_4 + 4O_2 \rightarrow 3CO_2 + 2H_2O$$

   a) How many moles of C_3H_4 react?

$$5.6\,L \times \frac{mole}{22.414\,L} = .25\,mole$$

   b) How many grams of water are produced?

$$.25\,mole\ C_3H_4 \times \frac{2\,H_2O}{1\,C_3H_4} \times \frac{18.02\,g}{mole} = 9.0\,g\,H_2O$$

   c) How many liters of carbon dioxide are produced?

$$.25\,mole\ C_3H_4 \times \frac{3\,CO_2}{1\,C_3H_4} \times \frac{22.414\,L}{mole} = 16.8\,L\,CO_2$$

16. List the following gases in order of increasing rate of effusion. He, Xe, HCl, Cl_2

Xe, Cl_2, HCl, He

17. The average speed of gas molecules is most directly related to the _____.
   a) polarity of the molecules
   b) pressure of the gas
   c) temperature of the gas
   d) number of moles in the sample