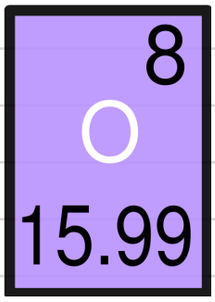
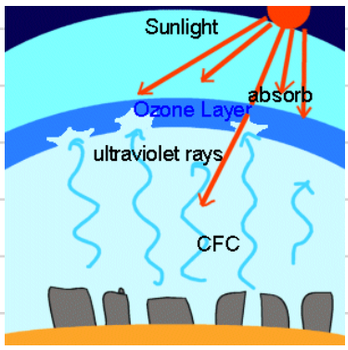
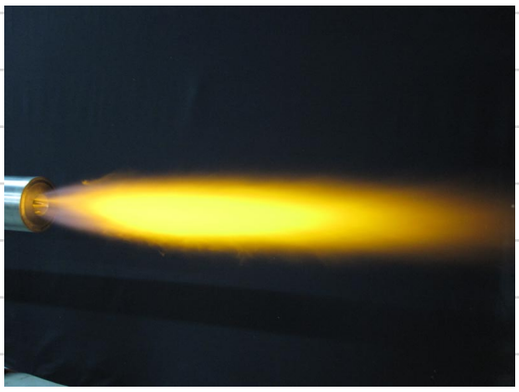
Common Gases

1. Oxygen - O2 - Colorless, Odorless, Scentless, used for breathing



2. Ozone - O3 - Blue, Odorless, Scentless, blocks UV rays to protect us from skin cancer.



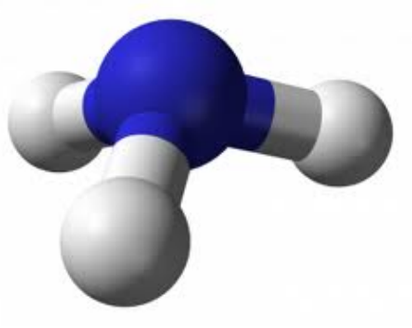


3. Hydrogen - H2 - Colorless, Odorless, Scentless, very Flammable

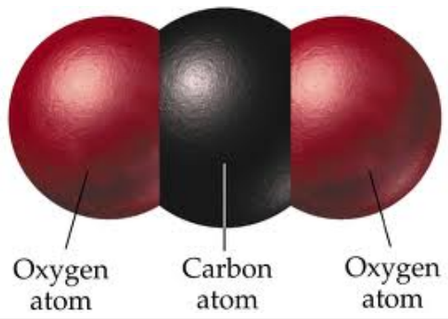
4. Nitrogen - N2 - Colorless, Odorless, Scentless, inert (doesn't react; noble gas)

Common Gases Continued

5. Ammonia - NH3 - Strong scent, colorless, tasteless, component of cat urine.

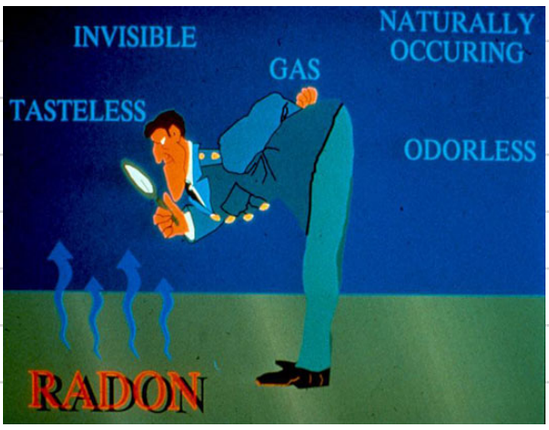


6. Carbon Dioxide- CO2 scentless, sour taste, colorless, puts out fires



7. Carbon Monoxide - CO Colorless, odorless, tasteless, poisonous. known as the "silent killer"

8. Radon - Rn - colorless, odorless, tasteless, radioactive, often found in basements.



Pressure

STP- Standard temperature and pressure (1 atm pressure, 0 C)

The common units for measuring pressure are:

atmosphere	Torr
mm Hg	lb/sq in.
Pascal(Pa)	kiloPascal (kPa)

Conversion Factors:

1 atm = 760 Torr = 760 mm Hg = 101 kPa = 14.7 lb/sq in

Pressure Laws

There are 5 basic gas laws.

1. Boyle's Law states that the pressure and volume of a gas are inversely proportional:

$P_1V_1 = P_2V_2$

2. Charles' Law states that the volume and temperature of a gas are directly proportional:

$V_1/T_1 = V_2/T_2$

3. GayLusac's Law states that the pressure and temperature of a gas are directly proportional:

$P_1/T_1 = P_2/T_2$

Pressure Laws Continued

4. Combined Gas Law. This law combines Boyle's, Charles', and Gaylusac's laws into one:

$P_1V_1/T_1 = P_2V_2/T_2$

5. Ideal Gas Law. This Law is used when the information of only one set of the variables is available and uses moles. Note that temperature must be given in Kelvin:

$PV = nRT$

Where P is the gas' pressure in atm or kPa

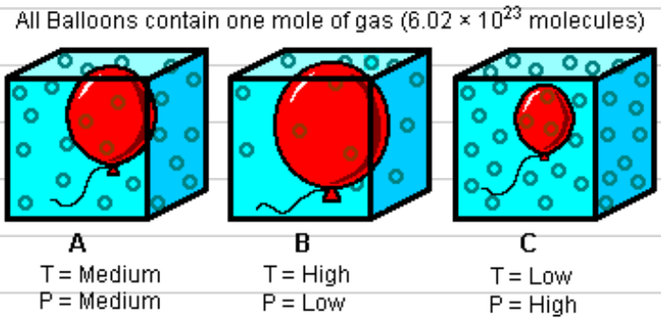
V is the gas' volume in Liters

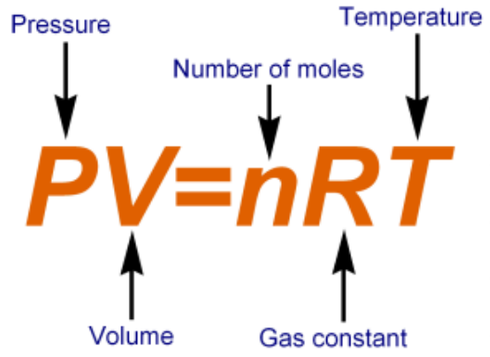
n is the mole amount of the gas

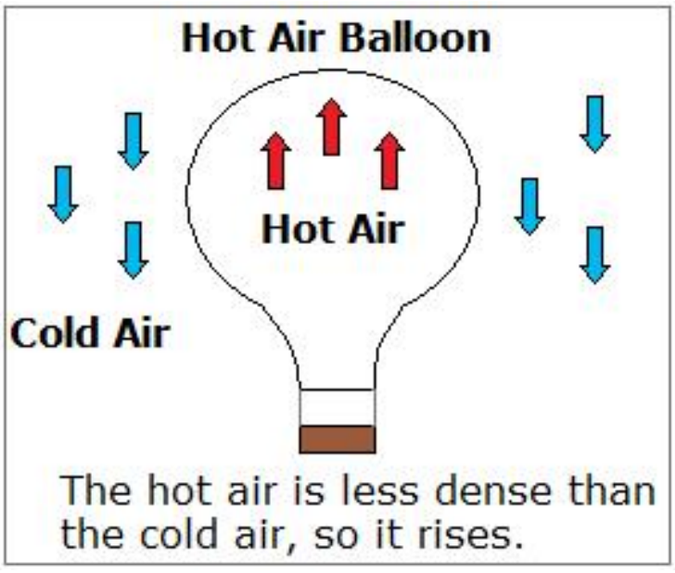
R is the constant 0.0821 L atm/K mole or 8.31 kPa L/K mole

and T is the temperature of the gas given in Kelvin

Figure 2. Volume of One Mole of Gas Under Different Conditions







Dalton's Law of Partial Pressure

Dalton's Law of Partial Pressure states that the pressures of all parts can be added together to find the pressure of the whole system. This is expressed:

P total = P1 + P2 ..... + Pn