Group Name:

Practice problems
Worksheet

Please don't edit, rearrange or delete anything that is already in this document. Just add your answers inside the boxes.
You can use shortcuts for superscripts and subscripts when needed:

X^2	Superscript	Ctrl+.
X_2	Subscript	Ctrl+,

Problem #1: Gas phase Reactions

6.31 g of Mg is added to 36.5 mL of 1.200M HCl. A double displacement reaction occurs in a sealed container at 25.0°C with 100.0ml above the solution. What is the pressure of the hydrogen gas generated?

1. Write balanced equation.

2. Determine moles of all reactants.

3. Identify the limiting reagent.

4. Calculate the moles of the desired product based on complete consumption of limiting reagent.

5. Calculate hydrogen pressure using Ideal Gas Law.

Problem #2: Two State Stoichiometric Problem

Nitrogen dioxide is formed in a closed container at 97°C and 1.00 atm when 2.10 g NO gas and 1.800 mole of O_2 gas are mixed. After the reaction is finished the pressure changes to 3.70 atm. What is the final temperature?

Part I: Stoichiometric Step

1. Express all reactants in terms of moles and calculate initial moles.

2. Balance the equation

3. Identify the limiting reagent.

4. Calculate the moles of the desired product based on complete consumption of limiting reagent.

5. Calculate moles excess reagent

6. Calculate total number of moles.

Part II: Two State Step

1. Fill in the values

State 1		State 2	
P_1		P_2	
V_1		V_2	
n_1		n_2	
T_1		T_2	?

2. Solve for T.

$$\frac{P_1V_1}{P_2V_2} = \frac{n_1RT_1}{n_2RT_2} \Rightarrow \frac{P_1}{P_2} = \frac{n_1T_1}{n_2T_2}$$

Problem #3: Diffusion

A gas of unknown identity diffuses at a rate of 70.9 mL/s in a diffusion apparatus in which carbon dioxide diffuses at the rate of 89.6 mL/s. Calculate the molecular mass of the unknown gas.
Hint: use Graham's law.