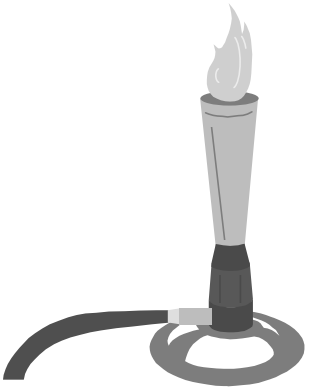

S'Mores

An Introduction to Chemical Equations, Stoichiometry, and Limiting Reagents!!!

PURPOSE:
1. To gain an understanding of reactants and products in a chemical reaction.
2. To perform calculations similar to those that will be done in stoichiometry.
3. To describe what a limiting reagent is and what it does in a chemical reaction.

MATERIALS:

Your teacher will provide an amount of graham crackers, chocolate bars, and marshmallows to be used to make as many s'mores as possible.

bunsen burner
paper towels
roasting tool

PROCEDURE:

- **Step 1** Weigh one of each of the reactants and record the mass to the nearest 0.01 gram. Record these masses neatly in your lab notebook.
- **Step 2** Record the following symbols to be used for each reactant with the above data.
  M = marshmallow
  G_2 = graham cracker (whole, not broken in half yet.)
  Cs = chocolate square (broken into the pieces that you wish to use on each s'more.)
- **Step 3** Perform a mechanical **synthesis reaction** with the resulting product taking the form that you and your partner agree on. Write out a balanced equation for this synthesis reaction in your lab notebook.
- **Step 4** Cause this reaction to go to completion by making as many of the product as you possibly can. Mass and record one of the representative products.
- **Step 5** Count and record how many products you were able to perform.
- **Step 6** What caused your reaction to stop? Record.
- **Step 7** The material responsible for your reaction reaching completion is called a limiting reactant. Define, in your own words, what a limiting reactant is.
- **Step 8** What, if anything, did you have leftover? What is the total mass of each left over reactant? Record.
- **Step 9** Answer the following questions in your lab notebook by comparing the masses involved in your reaction with the information supplied below.

  Question #1. How many s'mores could you make if you had started with 100.0 grams of each reactant?

  Question #2. What is the limiting reactant in the situation in question #1?

  Question #3. How much of each excess reactant will be left over?