Unit 8 Stoichiometry
S'mores Lab Activity

Name _____
Block ____

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Introduction

This laboratory activity explores the topics of stoichiometry and limiting reactants in a fun, delicious way! Mass/mole relationships and limiting and excess reactants can be difficult topics for students to grasp. Use this activity to introduce or reinforce these principles.

Stoichiometry is the area of chemistry that allows us to determine the relative quantities of reactants and products in a balanced chemical equation. The law of conservation of mass states that the mass of all participants in a chemical reaction must remain constant over time. Matter is neither created nor destroyed in a chemical reaction, and this principle lays the foundation for stoichiometry.

Activity

In this basic stoichiometric problem, we'll assume that one S'more represents 1 mole of product. The formula for one complete S'more is: **Gr_2Ch_3M**

Where   Gr = 1 graham cracker square
             Ch = 1 chocolate rectangle
             M = 1 marshmallow

1. Write a balanced chemical equation in the form of a synthesis reaction, using the ingredients as reactants and 1 S'more as the product.

2. What is the mole ratio of chocolate rectangles to S'mores?

3. If a box contains 30 graham cracker squares how many S'mores can be made? Show your work using dimensional analysis.

4. Today we have _____ graham crackers, ____ chocolate rectangles, and ____ marshmallows.

   a.) What is the total number of S'mores that can be made?

   b.) Which ingredient was the limiting reactant?

   c.) Which ingredients were in excess?

   d.) How much excess was leftover?

5. Using a digital scale, measure the mass of each ingredient in the S'more reaction and record it in the data table below:

Reactants	Molar Mass
Gr, Graham Cracker Square	g/mol
Ch, Chocolate Rectangle	g/mol
Mm, Marshmallow	g/mol

6. Using the data from the table above and the balanced chemical equation, calculate the molar mass of 1 S'more. Show your work.

7. If 100 grams of each reactant was used to make S'mores, which reactant would be considered the limiting reactant?   *Show your work. Circle your answer.*

8. Based on the results of #7 above, what is the theoretical yield of S'mores.

9. Using dimensional analysis, calculate the remaining mass of the excess reactants.