

Name: _____

Date: _____

Limiting Reactants

What determines the amount of product made in a chemical reaction?

Why?

In any chemical reaction, the amount of product made is dependent upon the amount of reactants available. Typically, one or more reactants are completely used up or consumed in the reaction. This activity will demonstrate how stoichiometric calculations can be used to determine which reactant will limit the amount of product made in the reaction.

Model 1

S'more Recipe:

- 2 graham cracker pieces
- 1 marshmallow
- 4 chocolate squares



Ingredients Available:

- 5 graham cracker pieces
- 3 marshmallows
- 8 chocolate squares

1) According to Model 1, how much of each ingredient is needed to make a s'more?

Graham cracker	
Marshmallow	
Chocolate square	

2) According to Model 1, how much of each ingredient do you have to make s'mores?

Graham cracker	
Marshmallow	
Chocolate square	

3) How many s'mores could you make using the recipe in Model 1 and the ingredients listed?

4) How much of each ingredient will you have left over after you have made the maximum amount of s'mores using the ingredients given in Model 1?

Graham cracker	
Marshmallow	
Chocolate square	

5) Which ingredient(s) did you have in excess and could use to make more s'mores?

6) Which ingredient was completely consumed when you made the s'mores?


7) Which ingredient(s) limited the amount of s'mores you could make?


- 8) a) You are given the following ingredients to make s'mores. Using the recipe above, determine the number of s'mores you could make with these ingredients.

Graham cracker	24
Marshmallow	35
Chocolate square	60

- b) How much of each ingredient would you have leftover?

Graham cracker	
Marshmallow	
Chocolate square	

-  9) In question #8, what ingredient(s) would you have in excess? What ingredient(s) would you use up completely when making s'mores?

-  10) Using what you have learned from model 1, write a definition for the term limiting reactant. Write your answer using a complete sentence.

Read This!

The limiting reactant in a chemical reaction is the reactant that is completely consumed in the reaction. No more product can be made because the limiting reactant has been used up completely. Thus, the limiting reactant limits the amount of product made in the reaction. The limiting reactant also is referred to as the limiting reagent.