

Stoichiometry and Cinnamon Toast

Chemistry I

Name _____

Directions:

1. Calculate the moles and grams of each ingredient required to make enough servings of cinnamon toast for the entire group to have two servings each based on the balanced chemical equation provided.
2. Show your work and write the calculated values in the respective columns.
3. Round your answers to two decimals.
4. Use the molar masses and common measurements of the elements and compounds provided below for your calculations.
5. Follow the lab protocol **after** finishing your calculations.

Molar Masses:

Bread: 25.0 g/mol

Butter ($C_{16}H_{32}O_2$): 290.4 g/mol

Cinnamon ($C_{16}H_{16}O_2$): 272.4 g/mol

Sugar ($C_{12}H_{22}O_{11}$): 342.3 g/mol

Common Kitchen Measurements:

1 tbsp butter = 14.8 g

1 slice of bread = 25 g

$\frac{1}{2}$ tsp cinnamon = 1.5 g

1 tsp sugar = 4 g

Balanced Chemical Equation: Shows the mole ratio between the reagents.

$1000 \text{ bread} + 25 \text{ butter} + 3 \text{ cinnamon} + 6 \text{ tsp sugar} \rightarrow 2 \text{ servings cinnamon toast}$

Fill in the Table: Calculate how much of each ingredient is needed to make enough cinnamon toast to feed the entire class. **Show your work** on the next page. You are given one amount, calculate the rest using the balanced equation and given conversion factors.

Number of People:			
Number of Servings:			
<i>Ingredient</i>	<i>Moles</i>	<i>Grams</i>	<i>Kitchen Measurements</i>
Bread	2		
Butter			
Cinnamon			
Sugar			

Show Your Work:

STOP before continuing to the lab.

Materials:

1. Paper plate
2. Plastic knife
3. Bread
4. Butter
5. Cinnamon
6. Sugar
7. Paper towel

Protocol:

1. Gather a paper plate, plastic knife, paper towel, and two slices of bread.
2. Toast the two bread slices for your preferred amount of time.
3. Gather 1 tbsp butter, $\frac{1}{2}$ tsp cinnamon, and 1 tsp sugar.
4. Spread 1 tbsp butter between the two slices of bread.
5. Spread $\frac{1}{2}$ tsp cinnamon between the two slices of bread.
6. Spread 1 tsp sugar between the two slices of bread.
7. Enjoy your cinnamon toast!

