The Great Chemistry Cookie Project

In this lab you will be converting a recipe from moles to standard cooking measurements and then using that recipe to bake some cookies!

You will need the following tables in order to convert your recipe:

Molecular Formula Table
Use the following molecular formulas to calculate grams of ingredients.
NOTE: Most of these substances have extremely complex molecular formulas. I have greatly simplified your project by listing a representative formula only.

Anise	$C_{10}H_{12}O$	Flour	$C_4H_8O_4$
Baking Soda	$NaHCO_3$	Lemon Juice	$C_6H_8O_7$
Baking Powder	$NaHCO_3$	Margarine	$C_9H_{12}O_6$
Brown Sugar	$C_{12}H_{22}O_{11}$	Milk	85% H_2O 15% $C_9H_{14}O_6$
Butter	$C_9H_{14}O_6$	Molasses	$C_{12}H_{22}O_{11}$
White Sugar	$C_{12}H_{22}O_{11}$	Pepper	$C_{17}H_{19}O_3N$
Chocolate	$C_4H_8O_4$	Salt	NaCl
Cinnamon	C_9H_8O	Vanilla	$C_8H_8O_3$
Cloves	$C_{10}H_{12}O_2$	Eggs	$C_6H_{12}O_3N_2$
Cream of Tartar	$KHC_4H_5O_6$		

Unit Conversions

Use the following conversions to get from grams to a standard cooking unit of measure.

1 teaspoon of baking soda = 2.84g
1 teaspoon of vanilla extract = 4.73g
1 large egg = 50g
1 cup flour = 141.95 g
1 teaspoon salt= 4.16 g
1 cup butter = 236.59 g
1 cup sugar =198.73 g
1 cup brown sugar = 141.46 g
1 ounce chocolate chips = 28.35 g
1 tablespoon lemon juice = 14.20 g
1 teaspoon baking powder = 2.84 g
1 teaspoon cream of tartar = 2.84 g
1 teaspoon cinnamon = 2.84 g

Chocolate Chip Cookies

Ingredients:
2.66 mol flour
0.0335 mol baking soda
0.036 mol salt
1.084 mol butter (at room temp)
0.44 mol sugar
0.31 mol packed brown sugar
0.624 mol eggs
0.062 mol vanilla
2.82 mol Chocolate Chips

Conversion Instructions

1) Convert moles to grams for each ingredient and record below.
2) Convert the grams to your baking measurement (cups, teaspoons, ect) and record below.

Baking Instructions:

- Preheat oven to 375°F. Stir flour with baking soda and salt; set aside.
- In large mixer bowl, cream butter with sugar, brown sugar, eggs and vanilla.
- Gradually blend dry mixture into creamed mixture.
- Stir in the Chocolate Chips.
- Drop tablespoon of dough per cookie onto ungreased cookie sheets.
- Bake at 375°F for 9 to 11 minutes or until golden brown.

Ingredient	Moles to grams	Grams to baking measurement