

Making Cookies: Problem Solving



Name _____
Date _____

Making Cookies: First Things First



Focus: Using proportions to solve problems.

The Problem

Cooks often change recipes to make more or less than the amount specified in the original recipe. If a cook wants to make half as many cookies as the recipe, he can multiply each ingredient amount by $\frac{1}{2}$ and know how much half of each ingredient is. So if a recipe calls for 2 cups of flour, 2 multiplied by $\frac{1}{2}$ is 1. Half of the recipe requires 1 cup of flour.

Working the Problem

1. Suppose a recipe makes 5 dozen cookies and you want to make 1 dozen. What fractional part of 5 dozen is 1 dozen? How do you know?

2. The recipe calls for 1 pound of flour. You know that there are about 4 cups of flour in one pound. How much flour do you need? The amount of cookies you want to make is $\frac{1}{5}$ of the batch. To find out how much flour, multiply 4 cups by $\frac{1}{5}$.

Enter 4 1 5 . What do you get?

Explain your result.

Unfortunately, measuring cups do not include fifths. Is the answer closer to $\frac{3}{4}$ or $\frac{2}{3}$?

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Here is a way to compare these measures: there are 16 tablespoons in 1 cup.
How many tablespoons are there in $\frac{4}{5}$ cup?

3. Enter **16** **4** **5** . What do you get?

Enter the answer in the table on the next page. Use the whole number part of the answer for the next calculation.

Since there are 16 tablespoons in a cup and the whole number part of the last answer was 12, you can use that fraction to help decide whether $\frac{4}{5}$ cup is closer to $\frac{2}{3}$ cup or $\frac{3}{4}$ cup.

What fractional part of a cup is $\frac{12}{16}$?

4. Enter **12** **16** . Then simplify the fraction by entering .

If you can simplify it again, enter .

What do you get? Enter the answer in the table below.

Is this fraction close to $\frac{4}{5}$ cup? How do you know?

Would you need to add or remove tablespoons of flour to make it closer to $\frac{4}{5}$ cup?

How much would you add or remove?

	Answers
$\frac{1}{5}$ of the flour	
$\frac{4}{5}$ cup flour in tablespoons	
$\frac{12}{16}$ cup simplified	

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Sometimes, changing a recipe is not that easy. Since the original recipe needed 4 cups of flour, what fractions would have been easier to calculate than $\frac{1}{5}$? Why do you think so?

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Making Cookies

The Problem: How much money can we make at a bake sale if we sell Bonnie's Favorite Sugar Cookies?

Your team is in charge of a bake sale for your class. The school cafeteria makes wonderful sugar cookies. Your teacher wants everyone in the class to make a batch of the sugar cookies to sell at the bake sale. When you receive the recipe from the cafeteria manager, it makes almost 200 cookies, uses pounds of flour and sugar, and is too much for anyone to make at home. Your teacher tells you to reduce the recipe to make a batch of three dozen cookies.

The Facts

- One pound of flour contains about 4 cups of flour.
- One pound of sugar contains about 2 cups of sugar.
- One pound of butter contains 2 cups of butter.

The Task

1. Your team will make a chart showing the following:
 - The cafeteria recipe and your version of the recipe to make three dozen cookies
 - The cost of the ingredients
 - The cost of three dozen cookies
 - The cost per cookie
 - The profit for one batch of cookies based on three different cookie process
 - A recommended price for a cookie
2. Each member of the team will write an explanation of the processes used to solve the problem. The explanation will include:
 - How the team decided on the amounts in the small batch of cookies
 - How the team calculated the cost of the cookies
 - How the price per cookie was determined

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Bonus: Take the small batch recipe home and make the cookies. Bring the cookies back to class to share.

Bonnie's Favorite Sugar Cookies

Ingredients

- 10 lb flour
- 4 lb sugar
- 8 lb butter
- $\frac{1}{2}$ cup vanilla extract
- 1 cup milk
- extra granulated sugar for rolling

Directions

Cream the butter until light. Gradually add the sugar, beating until light and fluffy. Beat in the vanilla and the milk. Gradually stir in the flour. The mixture will be very stiff. Continue mixing until the dough comes together in the bowl.

Roll $\frac{1}{4}$ -cup portions of dough into balls. Roll each ball in granulated sugar.

Place the balls on a parchment-lined cookie sheet. Press the balls flat with the bottom of a large cup to make the cookies about $\frac{1}{4}$ -inch thick. Bake at

350 degrees for 20 to 25 minutes, or until the edges are golden brown.

Remove cookies to a rack to cool.

Makes about 192 cookies.

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Using the TI-15

Making Cookies

$$35 \div 14 \text{ [Enter]}$$

$$35 \div 14 = 2.5$$

$$35 \text{ [Int}\div\text{]} 14$$

$$35 \div 14 = 2 \text{ r } 7$$

$$35 \times 1 \text{ [n]} 14 \text{ [d]} \text{ [Enter]}$$

$$35 \times \frac{1}{14} = 2 \frac{7}{14}$$

$\frac{N}{D} \rightarrow \frac{n}{d}$

$$\text{Simp} \text{ [Enter]}$$

$$2 \frac{7}{14} \rightarrow 2 \frac{1}{2}$$