

Chapter 2 Project

What's Cookin', Good Lookin'?

An activity to demonstrate the use of fractions in real life.

You are baking shortbread cookies for two events: your mother's birthday and your mathlete's celebration party. You have your grandfather Giuseppe's famous recipe and want to make the exact amount of cookies needed for both parties with one batch of dough, meaning you must adjust the size of the original recipe.

Giuseppe's Famous
Shortbread Cookies

Ingredient	Amount Needed
Butter	1 cup
Sugar	$\frac{1}{2}$ cup
Vanilla Extract	1 teaspoon
Salt	1 teaspoon
Flour	2 cups
Makes 36 cookies	

No extra directions are given, typical of grandpa, huh?

- Eighteen people are coming to your mother's birthday and 9 people are coming to the celebration party. How many total cookies do you need, assuming each person eats one cookie?
- First, let's determine how to adjust the recipe to make cookies for 18 people.
 - What fraction of the recipe do you need to make 18 cookies? (**Hint:** Place the part over the whole number of cookies the recipe makes and reduce.)
 - Multiply each of the ingredients by the fraction you found in part a.
- Next, let's determine how to adjust the recipe to make cookies for 9 people.
 - What fraction of the recipe do you need to make 9 cookies?
 - Multiply each of the ingredients by the fraction you found in part a.
- Find the sum of the individual ingredients from Problems 2 and 3 to create one new recipe. Rewrite any improper fractions as mixed numbers.
- Now you have an adjusted recipe to make the exact number of cookies needed. You have the following measuring cups and spoons: 1 cup, $\frac{1}{2}$ cup, $\frac{1}{4}$ cup, 1 teaspoon, $\frac{1}{2}$ teaspoon, $\frac{1}{4}$ teaspoon, and 1 tablespoon.
 - How would you measure out $\frac{3}{4}$ cup of an ingredient with the given cups?
 - Is it possible to measure out all of your ingredients with the given cups and spoons? If not, which ingredients?
 - Find at least two pairs of fractions that add to $\frac{3}{8}$.
 - If $\frac{1}{4}$ cup is equal to 4 tablespoons, how many tablespoons would be in $\frac{1}{8}$ cup?
 - How could you measure out $\frac{3}{8}$ cup of an ingredient with this new knowledge?
 - List at least two ways you could measure out the needed amount of flour.
- Your sister gifted you with some local artisanal pecan flour, and you want substitute some of the flour in the recipe with the pecan flour with a one-to-one substitution. Using the available measuring cups, list three combinations of measurements that you could use to combine the normal flour and pecan flour and still measure out the total needed amount of flour.
- Is it necessary to create a new adjusted recipe each time you want to make a certain amount of cookies? What are some additional strategies you could use to make a certain amount of cookies for a party?

8. Perform an internet search for recipes for your top three favorite cookies.
 - a. State at least three ingredients that are commonly found in these recipes that are not included in the shortbread cookie recipe.
 - b. Do you think any of these additional common baking ingredients are difficult to halve? Are any of these easy to double?
9. When doubling or halving a recipe, some common baking ingredients should not be doubled or halved. Perform an internet search and explain in your own words why that is true.

Chapter 2 Project: What's Cookin', Good Lookin'?

1. 27 cookies
2. a. $\frac{1}{2}$ of the recipe
 b. $\frac{1}{2}$ cup butter, $\frac{1}{4}$ cup sugar, $\frac{1}{2}$ teaspoon vanilla extract, $\frac{1}{2}$ teaspoon salt, 1 cup flour
3. a. $\frac{1}{4}$ of the recipe
 b. $\frac{1}{4}$ cup butter, $\frac{1}{8}$ cup sugar, $\frac{1}{4}$ teaspoon vanilla extract, $\frac{1}{4}$ teaspoon salt, $\frac{1}{2}$ cup flour
- 4.

Ingredient	Amount Needed
Butter	$\frac{3}{4}$ cup
Sugar	$\frac{3}{8}$ cup
Vanilla Extract	$\frac{3}{4}$ teaspoon
Salt	$\frac{3}{4}$ teaspoon
Flour	$1\frac{1}{2}$ cups
Makes 27 cookies	

5. a. Using the $\frac{1}{4}$ cup measuring cup three times will give $\frac{3}{4}$ cup.
 b. No, sugar
 c. Answers may vary. Some examples include $\frac{3}{4}$ or $\frac{1}{4} + \frac{1}{8}$ or $\frac{3}{16} + \frac{3}{16}$.
 d. 2 tablespoons
 e. $\frac{1}{4}$ cup plus 2 tablespoons or 6 tablespoons
 f. Answers may vary. Some examples include 1 cup plus $\frac{1}{2}$ cup, three $\frac{1}{2}$ cups, or six $\frac{1}{4}$ cups.
6. Answers may vary. Some examples include 1 cup flour and $\frac{1}{2}$ cup pecan flour, $\frac{3}{4}$ cup flour and $\frac{3}{4}$ cup pecan flour, or 1 cup plus $\frac{1}{4}$ cup flour and $\frac{1}{4}$ cup pecan flour.
7. No, it is not necessary. Answers may vary. You could make two batches separately, or you could make more than needed and eat the leftovers.
8. a. Answers may vary. Some examples are eggs, baking powder, baking soda, other extracts, or milk.
 b. Answers may vary. Eggs can be difficult to halve. Anything that is a small teaspoon measurement may be difficult to halve. Most ingredients are easily doubled using the measuring cups given.
9. Answers may vary. Doubling spices can overwhelm a recipe, such as salt, cinnamon, etc. Baking powder and baking soda follow specific ratios and may result in ruined cookies when doubled.