

3B Ratios and Proportions

Read:

Professional chefs use ratios and proportions daily to figure out how much of various ingredients they will need to make a particular dish. They may serve the same dessert one day to a wedding party with 300 guests, and another day to a dinner party for eight people. Ratios and proportions help them figure out the right quantities of ingredients to buy for each meal. In this skill sheet, you will practice converting a recipe for different group sizes.

A recipe for Double Fudge Brownies

Ingredients:

$\frac{3}{4}$ c. sugar	2 eggs
6 tablespoons unsalted butter	1 teaspoon vanilla extract
2 tablespoons milk	$\frac{3}{4}$ cup all-purpose flour
2 cups semi-sweet chocolate chips	$\frac{1}{3}$ teaspoon baking soda
$\frac{1}{4}$ teaspoon salt	2 tablespoons confectioner's sugar

Makes 16 brownies.

Examples:

- What is the ratio of milk to chocolate chips in the recipe above? $\frac{2 \text{ tablespoons}}{2 \text{ cups}}$
- When we know the ratios, we can make proportions by setting two ratios equal to one another. This will help us to find missing answers.

Suppose Patricia needs only 8 brownies and doesn't want any leftovers. Find out how much of each ingredient she needs. The original recipe will make 16 brownies. You will use the ratio of $\frac{8}{16} = \frac{1}{2}$ to find the amount for each of the ingredients. Use cross-multiplication to solve the proportions.

For flour:

Step 1 $\frac{8}{16} = \frac{x}{\frac{3}{4}}$

Step 2 $8 \times \frac{3}{4} = 16x$

Step 3 $6 = 16x$

Step 4 $\frac{6}{16} = \frac{16x}{16}$

Step 5 $\frac{3}{8} = x$

Patricia needs $\frac{3}{8}$ cup of flour to make 8 brownies.

Practice:

- What is the ratio of unsalted butter to eggs?
For every _____ tablespoons of butter, you will need _____ eggs.
- What is the ratio of flour to baking soda?
For every _____ cups of flour, you will need _____ teaspoon of baking soda.
- What is the ratio of salt to flour?
For every _____ teaspoon(s) of salt, you will need _____ cups of flour
- Find the correct amount of each ingredient to make 8 brownies ($\frac{1}{2}$ of the recipe).

Flour	$\frac{3}{8}$ cup
Sugar	
Butter	
Milk	
Chocolate chips	
Eggs	
Vanilla extract	
Baking soda	
Salt	
Confectioner's sugar	

- Why are the eggs and confectioner's sugar amounts easy to work with to make 8 brownies?
- Patricia has a little extra of all the ingredients. How many brownies can be made using 3 cups of chocolate chips?
- How much vanilla will she need when she makes the batch of brownies using 3 cups of chocolate chips?