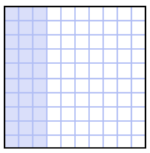
Solving Problems using Fractions, Decimals, and Percents

Multiple Ways to Name the Same Quantity

Some quantities, or numbers, can be represented in many different ways. For example, the model on the right represents a pan of brownies that has been cut into 100 equal sized pieces (brownies). Some of brownies are frosted and others are not.



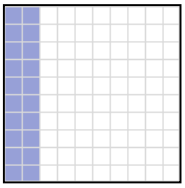
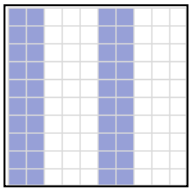
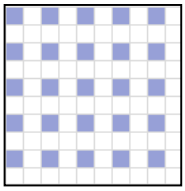
If we want to talk about the quantity frosted, we can represent it as:

- *A* ***fraction*** $\frac{30}{100}$ of the whole pan since 30 out of the 100 brownies in the pan are frosted
- *An* ***equivalent fraction or fraction in simplest form*** since $\frac{30}{100} = \frac{3}{10}$
- *The* ***ratio*** $\frac{3}{10}$ since 3 out of every 10 brownies are frosted
- *A* ***decimal equivalent*** 0.3 is the ***decimal*** equivalent of $\frac{3}{10}$ (3 digit in the tenths place is 3 tenths)
- *A* ***percent*** since "percent" means "out of 100" $\frac{30}{100}$ is 30 out of 100 or 30%

Part I. Name the following representations in multiple ways:

The following representations show the same pan of brownies with a different number of pieces frosted.

1.) Look at the representation then complete the table with other representations of the quantity.

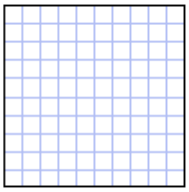
Representation	Fraction with a denominator of 100	Simplified fraction	Decimal	Percent
	$\frac{\quad}{100}$			
			0.4	
		$\frac{\quad}{4}$		

2.) Examine the decimal and percent values in each row. What do you notice about the relationship between the decimal and the percent? Describe any other patterns or relationships you notice.

Part II. Solving Problems using Fractions, Decimals, and Percents

A *"Healthy Foods"* survey was conducted with 100 middle school students. The responses are included in the problems below.

1.) Of the 100 students surveyed, 65 students preferred cold cereal to eggs for breakfast. Represent the problem by shading in the number of students that preferred cold cereal on the 100s grid on the right.



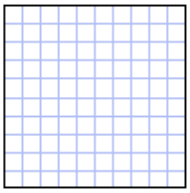
a.) Look at the shaded region of the 100s grid then complete the questions below:

Problem	Fraction with a denominator of 100	Simplified fraction	Decimal	Percent
Students that preferred cold cereal				
Students that preferred eggs				

b.) Examine the percent values for the number of students that preferred cold cereal and the percent that preferred eggs. Describe how the combined percents relate to the original problem.

c.) Examine the simplified fractions and also the decimals for the number of students that preferred cold cereal and those that preferred eggs. Describe any relationships you notice.

2.) Of the 100 students surveyed, 25% of the students preferred apples to oranges for a snack. Represent the problem by shading in the number of students that preferred oranges on the 100s grid on the right.

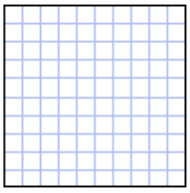


a.) Look at the shaded region of the 100s grid then complete the questions below:

Problem	Fraction with a denominator of 100	Simplified fraction	Decimal	Percent
Students that preferred apples				
Students that preferred oranges				

b.) If only 4 students were surveyed, how many would have to say they preferred oranges to have the 25% responding that they preferred apples. Explain your thinking using information from the table.

3.) Of the 100 students surveyed, 0.8 of the students preferred chicken to beef. Represent the problem by shading in the number of students that preferred chicken on the 100s grid on the right.



a.) Look at the shaded region of the 100s grid then complete the questions below:

Problem	Fraction with a denominator of 100	Simplified fraction	Decimal	Percent
Students that preferred chicken				
Students that preferred beef				

b.) If there were only 10 students surveyed, how many would you predict would prefer chicken. Explain your thinking using information from the table.