LESSON 3

Objective

Convert a percentage to a fraction.

Common Core State Standards

- **7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

Expressions and Equations

Fraction, Decimal, and Percentage Combinations that Equal 1

Previously, students learned to convert fractions to percentages. They divided the numerator by the denominator, multiplied the quotient by 100, and added a percent sign. In this lesson, students will work these steps backward to convert percentages to fractions.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *What fraction of the circle does each section represent?*
- **Ask:** *What is the decimal equivalent of each of the fractions?*
- Have students explain how to convert a percentage to a decimal and then a decimal to a fraction without using the Rainbow Fraction Circle Rings.

Solve It

Reread the problem with students. Have them convert the percentages to decimals. Then have students use the Rainbow Fraction® Circle Rings to determine the equivalent fractions in order to solve the story problem.

More Ideas

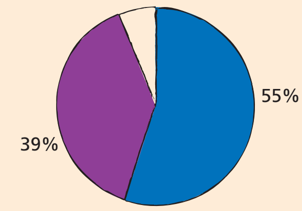
For another way to teach about fractions, decimals, and percentages—

- Students can repeat this activity using Fraction Tower® Equivalency Cubes to represent the various types of glass found in Roberto's artwork.

Formative Assessment

Have students try the following problem.

Which of the following sets of a fraction, decimal, and percentage represents the missing section of the circle graph shown here?



A. $\frac{6}{100}$, .6, 6% **B.** $\frac{3}{50}$, .06, 6%

C. $\frac{8}{50}$, .08, 16% **D.** $\frac{16}{100}$, .16, 16%

Try It!

40 minutes | Groups of 4

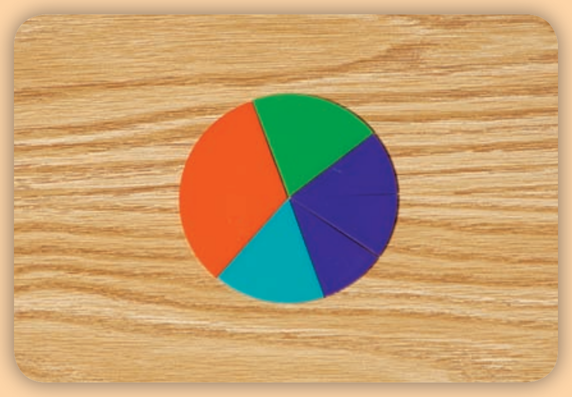
Here is a problem about fractions, decimals, and percentages.

Roberto is designing a circular glass work of art for his Fine Arts class. He would like the circle to be divided into four sections, each with a different type of glass. The sections should be 20% beveled glass, $16.\overline{6}\%$ swirled glass, 30% bubbled glass, and $33.\overline{3}\%$ wrinkled glass. What fraction of the circle will each texture be?

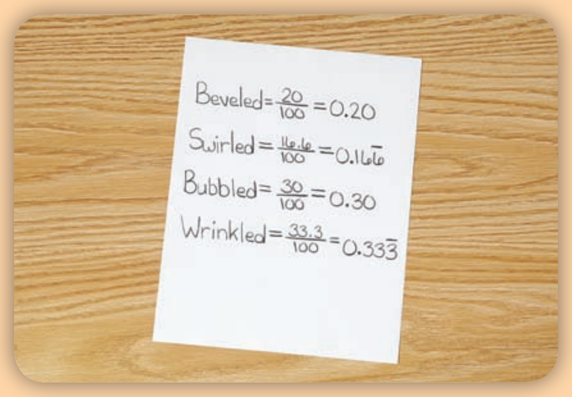
Introduce the problem. Then have students do the activity to solve the problem. Distribute the materials.

Materials

- Deluxe Rainbow Fraction® Circles
- Rainbow Fraction Circle Rings



1. Have students use the Fraction Circles to represent the percentages for each type of glass. The Percent Ring will help students choose the appropriate pieces. **Ask:** *What Fraction Circle piece will you use to represent the beveled glass section? The wrinkled glass section? How will you represent the bubbled glass?*



2. Now have students convert the percentages to decimals. **Ask:** *Which way should you move the decimal point, left or right? How many places should you move it?*

3. Have students use the Fraction Circle Rings to determine which fraction each decimal represents. Have students record their results on a sheet of paper.

Look Out!

Some students may add the $16.\overline{6}\%$ and the $33.\overline{3}\%$ and write the sum as $49.\overline{9}\%$. Explain to them that the repeating bar (̄) indicates that the last digit repeats endlessly and that the number is therefore an approximation. These percentages represent $\frac{1}{6}$ and $\frac{1}{3}$, which add up to $\frac{1}{2}$. It is understood that in these situations, the $.\overline{6}$ and the $.\overline{3}$ equal 1 when added, and so $16.\overline{6}\%$ plus $33.\overline{3}\%$ equals 50.0%.

Use Fraction Circles and Fraction Circle Rings to model each percentage. Write the percent as a fraction.

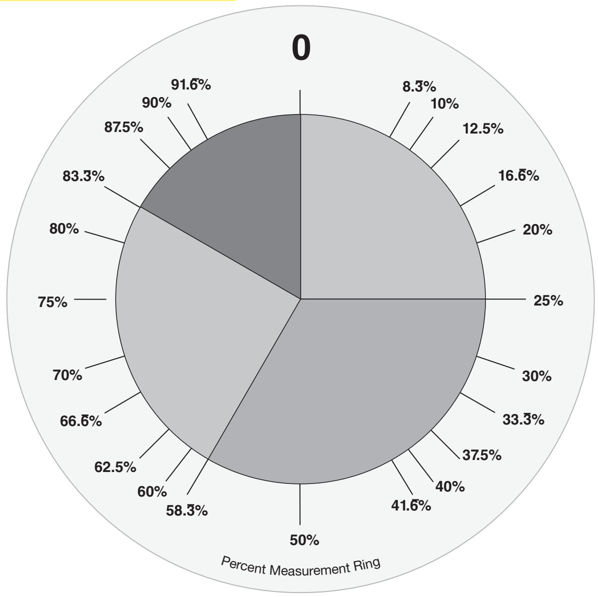
(Check students' work.)

1. 25% $\frac{1}{4}$

$33.\overline{3}\%$ $\frac{1}{3}$

25% $\frac{1}{4}$

$16.\overline{6}\%$ $\frac{1}{6}$



Using Fraction Circles and Fraction Circle Rings, model each percentage. Sketch the model. Write the percent as a fraction.

2. 20% $\frac{1}{5}$

12.5% $\frac{1}{8}$

37.5% $\frac{3}{8}$

30% $\frac{3}{10}$

Write each percent as a fraction.

3. 80% $\frac{4}{5}$

4. 62.5% $\frac{5}{8}$

5. $16.\overline{6}\%$ $\frac{1}{6}$

6. 87.5% $\frac{7}{8}$

7. $41.\overline{6}\%$ $\frac{5}{12}$

8. 75% $\frac{3}{4}$

Answer Key

Challenge! What does the word *percent* mean? Explain how to get the numerator and decimal of a fraction equivalent to a given percent.

Challenge: (Sample) *Percent* means per 100. The denominator of the fraction equivalent to a percent is 100. The numerator is the number of the percent written without a percent symbol.

Name ____________________________

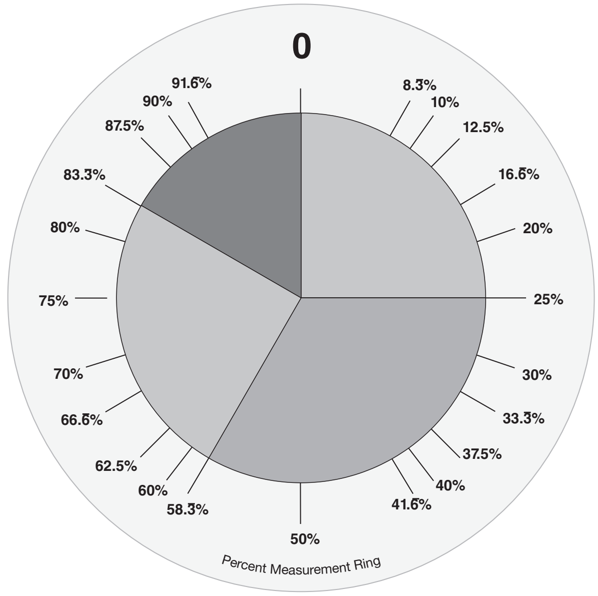
Use Fraction Circles and Fraction Circle Rings to model each percentage. Write the percent as a fraction.

1. 25% ______________

$33.\overline{3}$% ______________

25% ______________

$16.\overline{6}$% ______________



Using Fraction Circles and Fraction Circle Rings, model each percentage. Sketch the model. Write the percent as a fraction.

2. 20% ______________

12.5% ______________

37.5% ______________

30% ______________

Write each percent as a fraction.

3. 80%

____

4. 62.5%

____

5. $16.\overline{6}$%

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6. 87.5%

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7. $41.\overline{6}$%

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8. 75%

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Name ______________________________

Challenge! What does the word *percent* mean? Explain how to get the numerator and decimal of a fraction equivalent to a given percent.