

Key Concepts



Percents and Decimals

Objective Teach students how percents and decimals are related, and how to convert from one to the other.

Note to the Teacher *In Lesson 8-4, your students learned how percents were related to fractions and how to convert from one to the other. In this lesson, your students will learn a similar technique for relating decimals to percents. Students should realize that the calculations involved in converting decimals to percents are easier, since percents represent ratios that compare a number to 100, and decimals represent fractions with denominators that are powers of 10.*

Percents

Begin the discussion by presenting an example like the following.

Example 1 Suppose the population of Centerville is 10,000 and 1,100 of the residents are left-handed. What percent of the Centerville population is left-handed?

Solution The ratio of left-handed residents to the total population of Centerville is 1,100 to 10,000, which can be written as the fraction $\frac{1,100}{10,000}$. A percent is a ratio comparing a number to 100, so we set up a proportion.

$$\frac{1,100}{10,000} = \frac{x}{100}$$

The proportion can be solved using cross products and algebra skills.

$$100 \cdot 1,100 = 10,000 \cdot x \quad \text{Write the cross products.}$$

$$110,000 = 10,000x \quad \text{Divide each side by 10,000.}$$

$$11 = x$$

So, 11% of the population of Centerville is left-handed.

Expressing a Decimal as a Percent

The following example shows how a proportion can be used to change a decimal to a percent.

Example 2 The leading batter in a baseball league last season had a batting average of .365. (Point out that batting averages are decimals written without a leading zero as shown here; .365 is the same as 0.365.) In what percent of his official at-bats did this player get a hit?

Solution We need to change the decimal 0.365 to a percent. First express 0.365 as a fraction.

$$0.365 = \frac{365}{1,000}$$

To find the percent, set up and solve a proportion.

$$\frac{365}{1,000} = \frac{x}{100}$$

$$100 \cdot 365 = 1,000 \cdot x \quad \text{Cross multiply.}$$

$$36,500 = 1,000x \quad \text{Divide each side by 1,000.}$$

$$36.5 = x$$

So the player got a hit in 36.5% of his official at-bats.

Expressing a Percent as a Decimal

Now discuss with your students how to reverse the procedure. In other words, how does one express a percent as a decimal? This change can be accomplished by simply writing the percent as a fraction with 100 as the denominator, and then changing that fraction to a decimal. Do some examples in class. Then assign several for the students to do individually or in small groups. Here are some good examples.

Example 3 Express 23% as a decimal.

Solution Write 23% as a fraction with a denominator of 100.

$$23\% = \frac{23}{100}$$

Dividing by 100 results in the movement of the decimal point in the divisor two places to the left. So, $\frac{23}{100} = 0.23$. Therefore, $23\% = 0.23$.

Example 4 $9\% = \frac{9}{100}$
 $= 0.09$

Example 5 $12.5\% = \frac{12.5}{100}$
 $= 0.125$

Note to the Teacher *Computing with percents is an extremely important skill. Be sure to provide your students with numerous problems to work. This will help them solidify their understanding of the concept of percent, as well as help with their computational skills involving decimals.*

