

Percentages, Fractions, and Decimals

Imagine that your science class is doing a school survey to determine which eye colors are most common. The report from the sixth-grade class says that $\frac{3}{5}$ of the students have black or brown eyes, while $\frac{2}{5}$ have blue or green eyes. The seventh-grade class reports that 45 percent have black or brown eyes, and 55 percent have blue or green eyes. The eighth-grade class reports that 0.8 have black or brown eyes, and 0.2 have blue or green eyes. Yikes! Each class has a different way of showing its data! So how do you compare the reports? Well, it's not as complicated as it might look. You see, percentages, fractions, and decimals are just different ways of expressing the same information. Each one tells you *how much* or *how many* of a certain amount. As you learned on the last page, a percentage can be changed to a decimal. For example, 45 percent is equal to 0.45. Percentages can also be changed into fractions. Likewise, every fraction can be expressed as a decimal or percentage, and so on. When comparing numbers or doing operations with numbers, it is often easier to have all of your numbers in the same form before doing calculations.

PROCEDURE 1: To change a fraction to a decimal or percentage, divide the numerator of the fraction by the denominator to make a decimal. To change the decimal number into a percentage, move the decimal point two places to the *right*.

SAMPLE PROBLEM: Change $\frac{3}{5}$ into a decimal number and a percentage.

Step 1: Divide the numerator by the denominator.

$$3 \div 5 = 0.6$$

Step 2: To change the decimal into a percentage, move the decimal point two places to the right.

$$0.6 \rightarrow 0.60 \rightarrow 60\%$$

PROCEDURE 2: To change a decimal number into a fraction or percentage, place the decimal over its place value and reduce. To change a decimal into a percentage, see Step 2 of Procedure 1.

SAMPLE PROBLEM: Express 0.56 as a fraction and a percentage.

Step 1: Because 0.56 is in the *hundredths* place, put the whole number over 100 and reduce.

$$\frac{56}{100} = \frac{14}{25}$$

Step 2: To change a decimal into a percentage, move the decimal point two places to the right, as in step 2 of procedure 1.

$$0.56 \rightarrow 0.560 \rightarrow 56\%$$

Practice What You've Learned

1. Express the following percentages as decimal numbers:

a. 52% _____

b. 99% _____

c. 7.8% _____

d. 0.57% _____

Percentages, Fractions, and Decimals, continued

2. Express the following fractions as both a decimal number and a percentage.

a. $\frac{75}{100} =$ _____ b. $\frac{1}{8} =$ _____

c. $\frac{9}{20} =$ _____ d. $\frac{12}{4} =$ _____

e. $\frac{26}{13} =$ _____ f. $\frac{8}{32} =$ _____

3. Change the following decimal numbers into both a fraction and a percentage:

a. 0.3 = _____ b. 0.12 = _____

c. 0.99 = _____ d. 1.5 = _____

e. 0.505 = _____ f. 0.01 = _____

4. Write True or False next to each equation.

a. $2\frac{2}{5} = 2.4 = 24\%$ _____

b. $0.03 = 3\% = \frac{3}{100}$ _____

c. $0.45\% = \frac{90}{200} = 0.0045$ _____

d. $5.25 = 5\frac{14}{28} = 525\%$ _____

5. Convert the following equations into the same form and calculate. Hint: Do the calculation inside the parentheses before adding or subtracting.

a. $\frac{2}{5} + 0.12 =$ _____

b. $(75\% \text{ of } 60) - 3\frac{3}{5} =$ _____

c. $\frac{32}{8} - (15\% \text{ of } 20) =$ _____