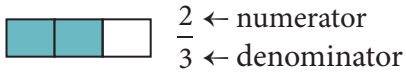


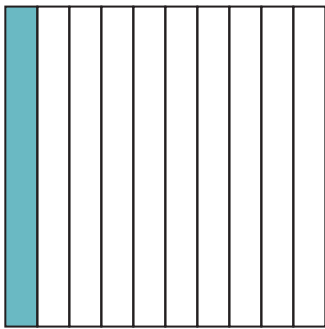
# Fractions, Decimals, and Percents

Fractions, decimals, and percents can name a part of a whole or a group.

The denominator in a fraction tells you how many equal parts there are in the whole or group. The numerator tells how many of those parts are being considered. Below is a model representing  $\frac{2}{3}$ , which is read *two thirds*.

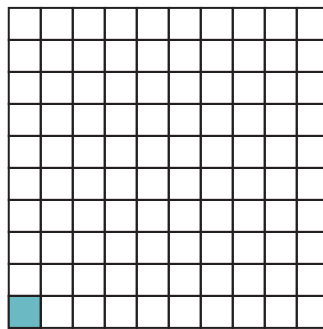


Decimals also name a part of a whole or a group. A decimal point (.) separates the whole number part from the decimal part.



Write: 0.1 or  $\frac{1}{10}$

Read: *one tenth*



Write: 0.01 or  $\frac{1}{100}$

Read: *one hundredth*

A fraction can be converted to a decimal by dividing the numerator by the denominator.

## EXAMPLE A

The Bulldogs football team won  $\frac{5}{8}$  of its games. What decimal represents the part of its games that the Bulldogs won?

Divide 5 by 8.

$$\begin{array}{r} 0.625 \\ 8 \overline{) 5.000} \\ \underline{-48} \phantom{00} \\ 20 \phantom{0} \\ \underline{-16} \phantom{0} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

**Solution:** The Bulldogs won 0.625 of its games.

## Fractions, Decimals, and Percents (continued)

There is a way to convert a fraction to a decimal without dividing. If the denominator can be written as 10, 100, 1,000, or so on, you can write an equivalent fraction with that number as a denominator.

### EXAMPLE B

Timmy correctly spelled 13 out of 20 spelling words on his quiz. What decimal represents the part of the words that Timmy correctly spelled?

**Step 1:** Write 13 out of 20 as a fraction.

$$\frac{13}{20}$$

**Step 2:** Determine if 20 is a factor of 100 or 1,000.

20 is a factor of 100 and 1,000.

**Step 3:** Write an equivalent fraction with 100 as the denominator.

$$\frac{13}{20} \times \frac{5}{5} = \frac{13 \times 5}{20 \times 5} = \frac{65}{100}$$

**Step 4:** Write the fraction as a decimal by writing the numerator as the decimal with the denominator as the number of places.

$$= 0.65$$

**Solution:**  $\frac{13}{20} = 0.65$

To convert a decimal to a fraction in simplest form, write the digits of the decimal as the numerator, with the least place value of the decimal as the denominator. Then write the fraction in simplest form.

### EXAMPLE C

Shamequa lives 0.84 kilometer from Mya. In simplest form, what fraction of a kilometer does Shamequa live from Mya?

**Step 1:** Write the decimal as a fraction. The least place is hundredths, so write a denominator of 100.

$$0.84 = \frac{84}{100}$$

**Step 2:** Find the greatest common factor (GCF) of 84 and 100.

The GCF of 84 and 100 is 4.

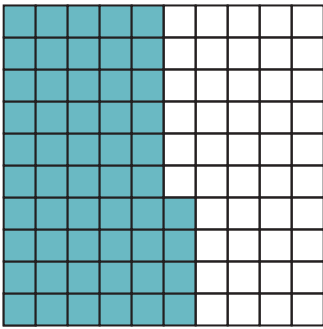
**Step 3:** Divide by the GCF.

$$\frac{84}{100} \div \frac{4}{4} = \frac{21}{25}$$

**Solution:** Shamequa lives  $\frac{21}{25}$  kilometer from Mya.

## Fractions, Decimals, and Percents (continued)

Percent means “per 100.” You can express a percent as a fraction with a denominator of 100.



Write: 54% or 0.54 or  $\frac{54}{100}$

Read: *fifty-four percent or fifty-four hundredths*

The model on the previous page shows that 54% means 54 per hundred, or 54 hundredths, or 0.54. To convert a percent to a decimal, divide the number shown in the percent by 100 and remove the percent sign.

### EXAMPLE D

A survey found that 72% of students think that the length of the school day is just right. What decimal is equivalent to 72%?

*Divide the 72 in 72% by 100 and remove the percent sign.*  $72\% \rightarrow 72 \div 100 = 0.72$

**Solution:**  $72\% = 0.72$

To convert a decimal to a percent, multiply the decimal by 100 and insert the percent sign.

### EXAMPLE E

It was found that 0.45 of all students at Mann Middle School walk to school. What percent of Mann students walk to school?

*Multiply 0.45 by 100 and insert a percent sign.*  $0.45 \times 100 = 45 \rightarrow 45\%$

**Solution:** 45% of Mann students walk to school.

To convert a fraction to a percent, first convert the fraction to a decimal. Then convert the decimal to a percent.

### EXAMPLE F

Terrance made 21 out of 24 free throws in practice today. What percent of his free throws did Terrance make?

**Step 1:** Write  $\frac{21}{24}$  in simplest form.

$$\frac{21}{24} \div \frac{3}{3} = \frac{7}{8}$$

**Step 2:** Divide the numerator by the denominator.

$$7 \div 8 = 0.875$$

**Step 3:** Convert the decimal to a percent.

$$0.875 \times 100 = 87.5 \rightarrow 87.5\%$$

**Solution:** Terrance made 87.5% of his free throws.

## Fractions, Decimals, and Percents (continued)

To convert a percent to a fraction in simplest form, write the percent as a number per 100 in fractional form. Then simplify the fraction.

### EXAMPLE G

Write 75% as a fraction in simplest form.

**Step 1:** Write 75% as a fraction with 100 as the denominator.

$$75\% = \frac{75}{100}$$

**Step 2:** Find the greatest common factor (GCF) of 75 and 100.

The GCF is 25.

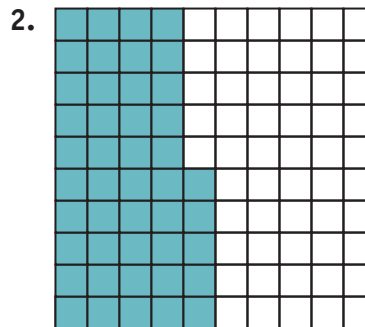
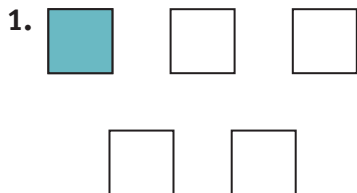
**Step 3:** Divide the numerator and denominator by the GCF, 25.

$$\frac{75}{100} \div \frac{25}{25} = \frac{75 \div 25}{100 \div 25} = \frac{3}{4}$$

**Solution:**  $75\% = \frac{3}{4}$

### PRACTICE

Write a fraction, decimal, and percent to describe the shaded part of each model.



Write as a decimal.

3.  $\frac{9}{10}$

4. 30%

5.  $\frac{3}{8}$

Write as a fraction in simplest form.

6. 0.4

7. 85%

8. 0.67

Write as a percent.

9. 0.7

10.  $\frac{1}{2}$

11.  $\frac{4}{5}$

12. Julie has saved \$42 toward her goal of \$75. Express the portion of her goal that she has saved as a fraction in simplest form, as a decimal, and as a percent. Explain how you found each representation.