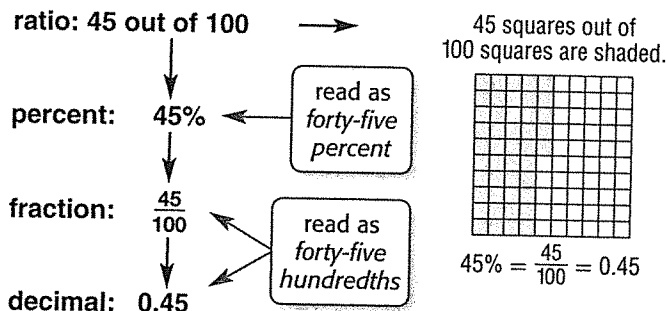


Introduction to Percents

KEY Concept

A **ratio** is a comparison of two numbers by division.
A **percent** is a ratio that compares a number to 100. A percent is written using the percent symbol: %.

Percents can also be written as fractions or decimals.



You can convert some fractions to percents by finding an **equivalent fraction** with a denominator of 100.
Any fraction can be converted to a decimal using division.
Any decimal can be converted to a percent.

VOCABULARY**decimal**

numbers that have digits in the tenths place and beyond

equivalent fractions

fractions that name the same number

percent

a ratio that compares a number to 100

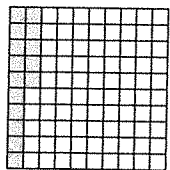
ratio

a comparison of two quantities by division; the ratio of 2 to 3 can be stated as 2 out of 3, 2 to 3, 2:3, or $\frac{2}{3}$

You can use models to show percents, fractions, and decimals.

Example 1

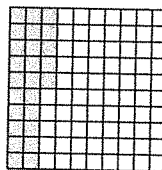
Identify the percent shown in the model.



- The model has 100 squares.
- There are 15 squares shaded.
- The ratio as a fraction of shaded squares to total squares is $\frac{15}{100}$.
- The fraction is equivalent to 15%.

YOUR TURN!

Identify the percent shown in the model.



- The model has _____ squares.
- There are _____ squares shaded.
- The ratio as a fraction of shaded squares to total squares is _____.
- The fraction is equivalent to _____.

Example 2

By the time a child reaches the age of 16 years, about 39% of his or her life has been spent sleeping. Write this percent as a fraction with 100 in the denominator and as a decimal.

1. To write 39% as a fraction, drop the percent sign. Then write a fraction with 39 in the numerator and 100 in the denominator.

$$\frac{39}{100}$$

2. To write the fraction as a decimal, divide 39 by 100.

0.39

Remember, to divide by 100, move the decimal point of the dividend two places to the left.

YOUR TURN!

Ruby works as an office manager. Her company recently moved to a new building with 133% more square feet of space. Write this percent as a fraction with 100 in the denominator and as a decimal.

1. Write 133% as a fraction.

2. Write 133% as a decimal.

Who is Correct?

Write 20% as a decimal.

Evelina
 $20\% = 0.02$

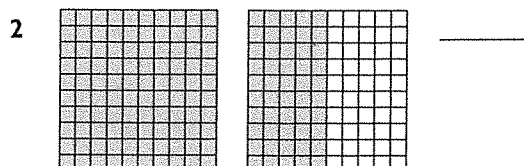
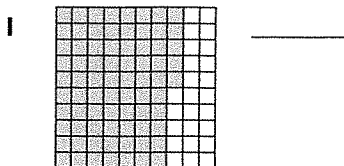
Charles
 $20\% = 20.00$

Julian
 $20\% = 0.2$

Circle correct answer(s). Cross out incorrect answer(s).

Guided Practice

Identify the percent shown in each model.



GO ON 

Step by Step Practice

3 Write 40% as a fraction with 100 in the denominator and as a decimal.

Step 1 Write 40% as a fraction.

$$\frac{\square}{\square}$$

Step 2 Write 40% as a decimal.

Write each ratio as a percent. Then write the ratio as a fraction with 100 in the denominator and as a decimal.

4 a student club with 100 students; 56 are girls

percent: $\frac{\square}{\square} = \text{_____}\%$

fraction: $\frac{\square}{\square}$

decimal: _____

5 a pack of 100 crayons; 52 are broken

percent: $\frac{\square}{\square} = \text{_____}\%$

fraction: $\frac{\square}{\square}$

decimal: _____

Write each ratio as a percent. Then write the ratio as a fraction with 100 in the denominator and as a decimal.

- 5 a pack of 100 crayons; 52 are broken

percent: $\frac{\boxed{} \times \boxed{}}{\boxed{} \times \boxed{}} = \frac{\boxed{}}{\boxed{}} = \text{_____}\%$

fraction: $\frac{\boxed{}}{\boxed{}}$

decimal: _____

- 6 100 pets at an animal shelter; 25 are dogs

percent: _____

fraction: _____

decimal: _____

- 7 a bookcase with 100 books; 37 are graphic novels

percent: _____

fraction: _____

decimal: _____

Write each percent as a fraction with 100 in the denominator and as a decimal.

8 14% _____

9 8% _____

10 65% _____

11 98% _____

12 72% _____

13 43% _____



Step by Step Problem-Solving Practice

Problem-Solving Strategies

Solve.

- 14 **MUSIC** In Kareem's class, 32% of the students like country music, 43% like hip-hop music, and 25% like rock music. Write each percent as a fraction with 100 in the denominator and as a decimal. What type of music did Kareem's class like the most?

- Use a table.
- Look for a pattern.
- Guess and check.
- Act it out.
- Write an equation.

Understand Read the problem. Write what you know. In Kareem's class, _____ of the students like country music, _____ like hip-hop music, and _____ like rock music.

Plan Pick a strategy. One strategy is to use a table.

Solve Complete the table to write each percent as a fraction with 100 in the denominator and as a decimal.

Write the fraction as a decimal, divide the percent by 100.

Music	Percent	Fraction	Decimal
Country	32%		
Hip-Hop	43%		
Rock	25%		

Kareem's class liked _____ music the most.

Check Add all three fractions. The sum should equal $\frac{100}{100}$.

- 15 **DOGS** In 2005, 15% of dogs registered with the American Kennel Club were Labrador retrievers. About 39% were German shepherds. Write each percent as a fraction with 100 in the denominator and as a decimal. Check off each step.

_____ **Understand:** I underlined key words.

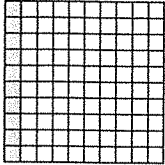
_____ **Plan:** To solve the problem, I will _____


_____ **Solve:** The answer is _____

_____ **Check:** I checked my answer by _____

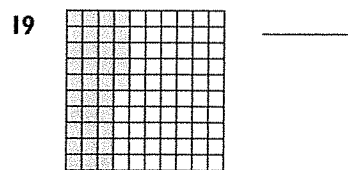
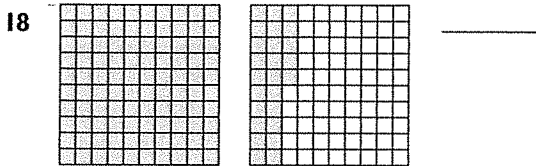
- 16 **BASKETBALL** In one basketball season, Alana made 48 out of 100 baskets. In the same season, Tess made 59 out of 100 baskets. Write the ratios as percents.
-

- 17 **Reflect** Name the decimal, percent, and fraction shown in the model. Explain your answer.



 **Skills, Concepts, and Problem Solving**

Identify the percent shown in each model.



Write each ratio as a percent. Then write the ratio as a fraction with 100 in the denominator and as a decimal.

- 20 baseball league with 100 players;
60 are girls

percent: _____

fraction: _____

decimal: _____

- 21 a puzzle with 100 pieces;
12 are blue

percent: _____

fraction: _____

decimal: _____



Write each percent as a fraction with 100 in the denominator and as a decimal.

22 16% _____

23 75% _____

24 80% _____

25 50% _____

26 150% _____

27 112% _____

Solve.

- 28 **EDUCATION** In the eighth-grade class of 100 students, 21 students have A's in math. Write the ratio of A students to total students as a percent. Then write the ratio as a fraction with 100 in the denominator and as a decimal.

- 29 **FOOD** The cafeteria kept track of the food selections of 100 students. The results are shown in the table at the right. Write each percent as a decimal.

Food	Percent of Students
Chicken	14%
Taco	26%
Pasta	20%
Pizza	40%

Vocabulary Check Write the vocabulary word that completes each sentence.

- 30 A(n) _____ is a ratio that compares a number to 100.

- 31 A(n) _____ is a comparison of two quantities by division.

- 32 Fractions that name the same number are _____.

- 33 **Writing in Math** To write a percent as a decimal, you can write the percent as a fraction with a denominator of 100. For example,

$$35\% = \frac{35}{100} = 0.35. \text{ So, 35 divided by 100 is 0.35.}$$

How can you write a decimal as a percent using multiplication?

