Please get a clicker, scratch paper, and get ready to log in.

Percents, Fractions, and Decimals

What You'll Learn

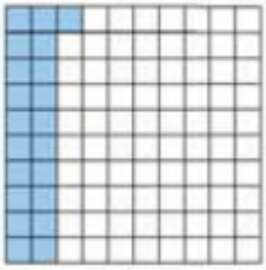
To convert between fractions, decimals, and percents

Why Learn This?

The food labels below all use a different form of $\frac{1}{2}$. Any rational number can be written as a fraction, a decimal, or a percent.

KEY CONCEPTS **Fractions, Decimals, and Percents**

The model at the right shows 21 out of 100 squares shaded. You can write the shaded part of the model as a fraction, a decimal, or a percent.



Fraction	Decimal	Percent
$\frac{21}{100}$	0.21	21%

Copy this into your notes: A percent is a rate per 100.

To write a decimal as a percent, you can multiply the decimal by 100.

EXAMPLE 1 Writing Decimals as Percents

Write 0.759 as a percent.

$$0.759 = \frac{759}{1{,}000} \quad \leftarrow \text{Write as a fraction.}$$

$$= \frac{75.9}{100} \quad \leftarrow \text{Write an equivalent fraction with 100 in the denominator.}$$

$$= 75.9\% \quad \leftarrow \text{Write as a percent.}$$

1 EXAMPLE Write each decimal as a percent.

a. 0.06 0.06. = 6%

b. 0.523 0.52.3 = 52.3%

c. 0.5 0.50. = 50%

d. 0.95 0.95. = 95%

← Move the decimal point two places to the right

1. Write 0.607 as a percent.

A. 60.7%

B. 0.607%

C. 607%

D. 6.07%

To write a percent as a decimal, you can divide it by 100, or move the decimal point two places to the left.

EXAMPLE 2 Writing Percents as Decimals

Write 47.5% as a decimal.

$$47.5\% = \frac{47.5}{100} \quad \leftarrow \text{Write the percent as a fraction.}$$

$$= 0.475 \quad \leftarrow \text{Divide.}$$

2 EXAMPLE Write each percent as a decimal.

a. 4% $0.04. \longrightarrow 0.04$

b. 34.3% $0.34.3 \longrightarrow 0.343$

c. 16% $0.16. \longrightarrow 0.16$

d. 6.4% $0.06.4 \longrightarrow 0.064$

← Move the decimal point two places to the left.

1. Write 35% as a decimal.

   A. 3.5

   B. 0.35

   C. 0.0035

   D. 35.0

2. Write 12.5% as a decimal.

A. 12.5
B. 0.0125
C. 1250
D. 0.125

3. Write 7.8% as a decimal.

A. 7.8
B. 780.0
C. 0.078
D. 0.78

When the denominator of a fraction is a factor of 100, you can easily use equivalent ratios to convert the fraction to a percent. For fractions with other denominators, you can use a calculator to convert the fraction into a decimal, and then rewrite the decimal as a percent.

EXAMPLE 5 Writing Fractions as Percents

Nutrition In a slice of cheese pizza, 45 Calories are from fat. The total number of Calories in each slice is 158. About what percent of the Calories are *not* from fat? Round to the nearest tenth of a percent.

Step 1 Find the number of Calories that are not from fat.

$158 - 45 = 113$

Step 2 Estimate.

$\frac{113}{158} \approx \frac{120}{160}$, which is $\frac{3}{4}$, or 75%.

Step 3 Write the ratio.

$\frac{113}{158}$ ← Calories from fat / ← total Calories

$113 \div 158 = 0.71518987$ ← Use a calculator.

$= 71.518987\%$ ← Write as a percent.

$\approx 71.5\%$ ← Round to the nearest tenth of a percent.

About 71.5% of the Calories are not from fat.

3 EXAMPLE Write each fraction as a percent. When necessary, round to the nearest tenth of a percent.

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

$\frac{3}{10} = 0.3$ ← Divide the numerator by the denominator.

$= 30\%$ ← Write as a percent.

b. $\frac{37}{49}$

37 ÷ 49 = 0.7551020408 ← Use a calculator.

$= 75.5102041\%$ ← Write as a percent.

$\approx 75.5\%$ ← Round to the nearest tenth of a percent.

3 EXAMPLE (continued)

c. $\frac{6}{30}$

6 ÷ 30 = 0.2 ← Use a calculator.

≈ 20% ← Write as a percent.

d. $\frac{14}{65}$

14 ÷ 65 = 0.2153846154 ← Use a calculator.

= 21.5384615% ← Write as a percent.

≈21.5% ← Round to the nearest tenth of a percent.

1. Write $\frac{21}{40}$ as a percent. If necessary, round to the nearest tenth of a percent.

   A. 52.5%
   B. 53%
   C. 160%
   D. 1.6%

You can write a percent as a fraction. First write the percent as a fraction with a denominator of 100. Then simplify the fraction.

EXAMPLE 4 Writing Percents as Fractions

Science Behavioral scientists observed an elephant that slept about 12.5% of each day. What fraction of each day did the elephant sleep?

$$12.5\% = \frac{12.5}{100}$$ ← Write 12.5% as a fraction with a denominator of 100.

$$= \frac{12.5 \times 10}{100 \times 10}$$ ← Multiply the numerator and denominator by 10.

$$= \frac{125 \div 125}{1{,}000 \div 125}$$ ← Divide both numerator and denominator by the GCF, 125.

$$= \frac{1}{8}$$ ← Simplify the fraction.

The elephant slept about $\frac{1}{8}$ of each day.

EXAMPLE 4 Write each percent as a fraction in simplest form.

a. 18%

$$18\% = \frac{18}{100}$$ ← Write 18% as a fraction with a denominator of 100.

$$= \frac{18 \div 2}{100 \div 2}$$ ← Divide the numerator and the denominator by the GCF, 2.

$$= \frac{9}{50}$$ ← Simplify the fraction.

b. 12%

$$12\% = \frac{12}{100}$$ ← Write 12% as a fraction with a denominator of 100.

$$= \frac{12 \div 4}{100 \div 4}$$ ← Divide the numerator and the denominator by the GCF, 4.

$$= \frac{3}{25}$$ ← Simplify the fraction.

4 EXAMPLE (continued)

c. 45%

$45\% = \frac{45}{100}$ ← Write 45% as a fraction with a denominator of 100.

$= \frac{45 \div 5}{100 \div 5}$ ← Divide the numerator and the denominator by the GCF, 5.

$= \frac{9}{20}$ ← Simplify the fraction.

1. An elephant eats about 6% of its body weight in vegetation each day. How can this be written as a fraction in simplest form?

A. $\frac{3}{50}$

B. $\frac{0.3}{50}$

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

D. $\frac{3}{100}$

To compare rational numbers in different forms, you can write all the numbers in the same form. Then graph each number on a number line.

EXAMPLE 5 Ordering Rational Numbers

Order 0.52, 37%, 0.19, and $\frac{1}{4}$ from least to greatest.

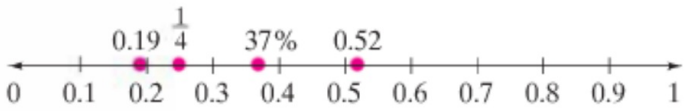
Write all the numbers as decimals. Then graph them.

0.52 ← This number is already in decimal form.

$37\% = 0.37$ ← Move the decimal point two places to the left.

0.19 ← This number is already in decimal form.

$\frac{1}{4} = 0.25$ ← Divide the numerator by the denominator.



From least to greatest, the numbers are 0.19, $\frac{1}{4}$, 37%, and 0.52.

EXAMPLE 5 Order from least to greatest.

a. $\frac{3}{5}$, $\frac{2}{10}$, 0.645, 13%

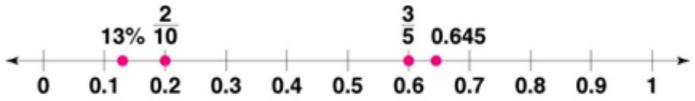
Write all numbers as decimals. Then locate each on a number line.

$\frac{3}{5} = 0.6$ ← Divide the numerator by the denominator.

$\frac{2}{10} = 0.2$ ← Divide the numerator by the denominator.

0.645 ← This number is already in decimal form.

$13\% = 0.13$ ← Move the decimal point two places to the left.



5 EXAMPLE (continued)

b. 40%, $\frac{10}{20}$, 18%, 0.082

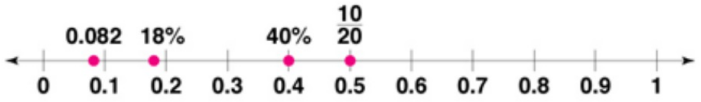
Write all numbers as decimals. Then locate each on a number line.

40% = 0.4 ← Move the decimal point two places to the left.

$\frac{10}{20}$ = 0.5 ← Divide the numerator by the denominator.

18% = 0.18 ← Move the decimal point two places to the left.

0.082 ← This number is already in decimal form.



1. Order from least to greatest: $\frac{3}{10}$, 0.74, 29%, $\frac{11}{25}$.

A. 29%, $\frac{3}{10}$, $\frac{11}{25}$, 0.74

B. 29%, $\frac{3}{10}$, 0.74, $\frac{11}{25}$

C. $\frac{3}{10}$, $\frac{11}{25}$, 29%, 0.74

D. $\frac{3}{10}$, 29%, $\frac{11}{25}$, 0.74

2. Order from least to greatest: 15%, $\frac{7}{20}$, 0.08, 50%.

A. 0.08, $\frac{7}{20}$, 15%, 50%

B. $\frac{7}{20}$, 0.08, 15%,50%

C. $\frac{7}{20}$, 50%, 0.08, 15%

D. 0.08, 15%, $\frac{7}{20}$, 50%

6. When you write a percent as a decimal, why do you move the decimal point 2 units to the left?

A. You are dividing by 100.

B. You are multiplying by 100

C. You are dividing by 1000.

D. You are multiplying by 1000.

Power down your clickers and put them away. You have an assignment worksheet.

Name _____ Class _____ Date _____

Practice 5-1

Percents, Fractions, and Decimals

Write each percent as a fraction in simplest form and as a decimal.

1. 65% _____
2. 37.5% _____
3. 80% _____
4. 25% _____
5. 18% _____
6. 46% _____
7. 87% _____
8. 8% _____
9. 43% _____
10. 55% _____
11. 94% _____
12. 36% _____

Write each number as a percent. Round to the nearest tenth of a percent where necessary.

13. $\frac{8}{15}$ _____
14. $\frac{7}{50}$ _____
15. 0.56 _____
16. 0.0413 _____
17. $\frac{3}{8}$ _____
18. $\frac{7}{12}$ _____
19. 0.387 _____
20. 0.283 _____
21. $\frac{2}{9}$ _____

Write each number as a percent. Place the number into the puzzle without using the percent sign or decimal point.

22.

Across

1. 0.134
3. $\frac{53}{100}$
5. 0.565
7. $1\frac{7}{50}$
9. 0.456
10. 0.63
11. $\frac{11}{200}$
13. 0.58
14. $\frac{191}{200}$
16. 0.605

Down

2. 0.346
4. 0.324
5. $\frac{1}{2}$
6. 0.515
8. $\frac{33}{200}$
9. 0.4385
10. $\frac{659}{1{,}000}$
12. $\frac{1{,}087}{20{,}000}$
15. $\frac{14}{25}$