Core Focus on
Ratios, Rates and Statistics

Introducing Percents

Warm-Up

Write each fraction as a decimal.

1. $\dfrac{1}{4}$ **2.** $\dfrac{2}{3}$ **3.** $\dfrac{4}{5}$

    0.25   **0.$\overline{6}$**   **0.8**

Write each decimal as a fraction in simplest form.

4. 0.3   **5.** 0.5   **6.** 0.15

    $\dfrac{3}{10}$ $\dfrac{1}{2}$ $\dfrac{3}{20}$

Introducing Percents

Write percents as fractions and decimals.

Vocabulary

Percent
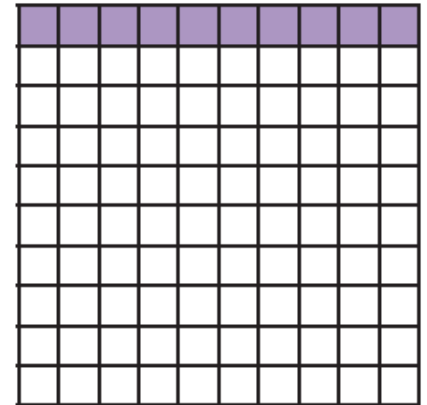
A ratio that compares a number to 100.

Good to Know!

✓ When a number is written as a percent, the symbol % is placed after the number.

$$\frac{10 \text{ shaded}}{100 \text{ squares}} = 10\%$$

Example: The ratio $\frac{10}{100}$ can also be written 10%.

✓ One way to visualize a percent is to shade squares on a 10 by 10 grid. A 10 by 10 grid has 100 squares so 10% means 10 of the 100 squares are shaded.
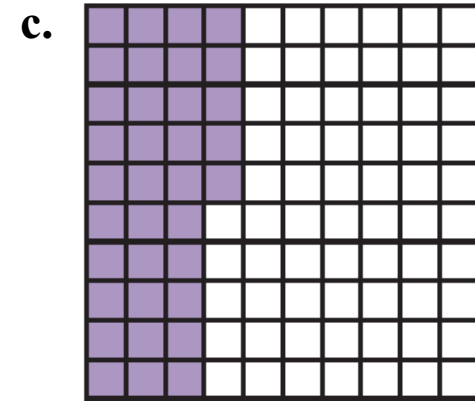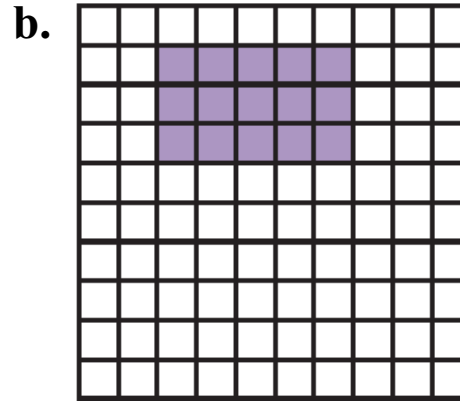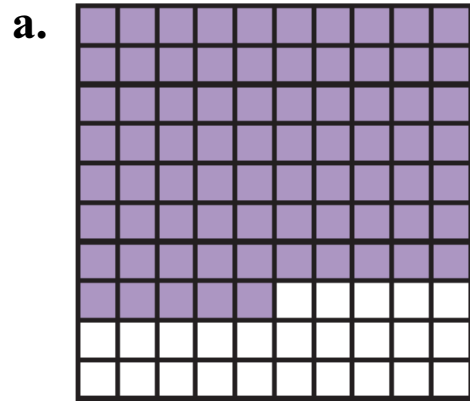
✓ Percents can be very small or very large. No matter how small or how large, a percent is always a number compared to 100.

Explore!   Percents

Step 1   For each shaded grid, write:
- The ratio of the shaded squares to 100 (a fraction).
- The percent of squares shaded as a number with the % sign.

a.   **b.**   **c.**

Step 2   How many squares would be shaded on a 10 by 10 grid for each problem?

    a.   1%   **b.**   25%   **c.**   50%   **d.**   100%   **e.**   0%

Step 3   Kim bought 100 balloons for her birthday party. She used 86 of them. What percent of the balloons did she use?

Explore! Percents

Step 4   B.J. used 60 envelopes out of 100.

     a.   What percent of envelopes did he use?

     b.   What percent of envelopes were left over?

Step 5   Create a 10 by 10 grid. Shade in $\frac{3}{10}$ of the squares.

Step 6   What percent of the squares are shaded in the grid from **Step 5?**

Step 7   Write $\frac{3}{10}$ as a decimal. What do you notice about the decimal and the percent from **Step 6?**

Write Percents as Fractions and Decimals

◆ To write a percent as a fraction, write the value of the percent in the numerator of the fraction and 100 in the denominator. Write the fraction in simplest form.

◆ To write a percent as a decimal, write it as a fraction and then convert the fraction to a decimal.

Example 1

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

a. 25%   **b. 2%**   **c.   100%**

Fraction	Decimal

Example 2

A toy manufacturer finds it acceptable if 0.01% of the toys made are defective.

a. Write this number as a fraction in simplest form.

Write the percent as a fraction with 100 in the denominator.

$$0.01\% = \frac{0.01}{100}$$

Multiply the numerator and denominator by 100 to write an equivalent fraction without a decimal.

$$\frac{0.01}{100} = \frac{1}{10000}$$

× 100

× 100

$0.01\% = \frac{1}{10000}$. This means if only 1 out of every 10,000 toys is defective, the toy manufacturer will be satisfied.

Example 2 Continued…

A toy manufacturer finds it acceptable if 0.01% of the toys made are defective.

b.   Write this percent as a decimal.

Write the percent as a fraction. $0.01\% = \dfrac{0.01}{100}$

Convert the fraction to a decimal. $0.01 \div 100 = 0.0001$

0.01% = 0.0001

Example 3

Pablo opened a bookstore. During his second year, he sold 150% of the books he had sold his first year.

a.   Write this percent as a fraction in simplest form.

Write the percent as a fraction with 100 in the denominator.

$$150\% = \frac{150}{100}$$

Simplify the fraction.

$$\frac{150}{100} = \frac{3}{2} = 1\frac{1}{2}$$

This means he sold $1\frac{1}{2}$ times as many books his second year.

Example 3 Continued…

Pablo opened a bookstore. During his second year, he sold 150% of the books he had sold his first year.

b. Write this percent as a decimal.

Write the percent as a fraction.
$$150\% = \frac{150}{100}$$

Convert the fraction to a decimal.
$$150 \div 100 = 1.5$$

150% = 1.5

Communication Prompt

Describe at least one time you have seen or used percents outside of math class. What did the percent mean?

Exit Problems

1. Write each percent as a fraction in simplest form.

   a) 25% $\dfrac{1}{4}$ b) 40% $\dfrac{2}{5}$

2. Write each percent as a decimal.

   a) 35% **0.35**   b) 60% **0.6**

3. Svetlana found a shirt on sale for 25% off. What percent of the original price will she pay for the shirt? **75%**