

4.1

Percents as Fractions and Decimals

YOU WILL NEED

- grid paper
- a calculator

GOAL

Solve percent problems using equivalent fractions or decimals.

LEARN ABOUT the Math

48% of Nestor's class stay for lunch. Nestor wants to represent this percent on a 5×5 grid. He knows that he can easily show 48% on a 10×10 grid.



How many squares of the 5×5 grid should Nestor colour?

- Write 48% as a fraction of 100 and as a decimal.
- How could you rename your fraction in part A as an equivalent fraction to help you solve the problem?
- How many of the 25 squares on Nestor's grid represent 48%?

Reflecting

- How did renaming the percent help you solve the problem?
- Why is it always easy to write a percent as a decimal?



WORK WITH the Math

Example 1 Writing a percent as a fraction and a decimal



In Ashley's class, 75% of the students ride the bus to school. Write the number of students who ride the bus as a fraction in lowest terms and as a decimal.

Ashley's Solution

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

$$\begin{array}{c} \div 25 \\ \frac{75}{100} = \frac{3}{4} \\ \div 25 \end{array}$$

$$75\% = 0.75$$

75% means 75 parts out of 100.

To rename $\frac{75}{100}$ as a fraction in lowest terms, I divided the numerator and the denominator by the same number. I know that $\frac{3}{4}$ is in lowest terms because 3 and 4 have no common factors.

I can rename $\frac{75}{100}$ as 0.75.

Example 2 Expressing a fraction as a percent



According to a school newspaper, $\frac{2}{5}$ of the 750 students in the school signed a petition for less homework. What percent of students signed the petition?

Pavlo's Solution

$$\begin{array}{c} \frac{2}{5} = \frac{4}{10} \\ \frac{4}{10} = \frac{40}{100} \end{array}$$

40% of students signed the petition.

$\frac{2}{5} < \frac{1}{2}$, so 40% seems reasonable.

To write $\frac{2}{5}$ as a percent, I needed to rename $\frac{2}{5}$ as an equivalent fraction with a denominator of 100.

I can rename $\frac{40}{100}$ as 40%.

I knew my answer must be less than 50%.

A Checking

1. Rename each percent as a fraction.

a) $24\% = \frac{\square}{50}$

c) $50\% = \frac{\square}{20}$

b) $40\% = \frac{\square}{10}$

d) $75\% = \frac{\square}{20}$

2. In Giulia's class, 36% of the students speak more than one language. Write the number of students who speak more than one language as a fraction in lowest terms.

B Practising

3. Rename each decimal as a fraction.

a) $0.10 = \frac{\square}{10}$

c) $0.33 = \frac{\square}{100}$

b) $0.34 = \frac{\square}{50}$

d) $0.2 = \frac{\square}{5}$

4. In Eric's class, 35% of the students have blond hair. Write the number of students with blond hair as a fraction in lowest terms.

5. Write each percent as a fraction in lowest terms.

a) 22%

b) 5%

c) 30%

d) 72%

6. Write each percent as a decimal.

a) 3%

b) 94%

c) 100%

d) 40%

7. Complete this table.

Percent	Decimal	Fraction in lowest terms
60%		
	0.09	
		$\frac{3}{100}$
44%		
		$\frac{6}{25}$
	0.5	
		$\frac{3}{3}$
12%		

8. Match each percent to the figure that represents it.

a) 50%

b) 75%

c) 25%

d) 40%



9. Claudia's new coat is made of 60% wool, 30% polyester, and 10% nylon. Write each percent as a fraction in lowest terms.

10. Complete each statement using $<$, $>$, or $=$. Explain your answers.

a) $0.3 \blacksquare 30\%$

d) $20\% \blacksquare \frac{4}{25}$

b) $0.45 \blacksquare \frac{7}{45}$

e) $\frac{2}{8} \blacksquare 25\%$

c) $\frac{3}{5} \blacksquare 40\%$

f) $42\% \blacksquare 4.2$

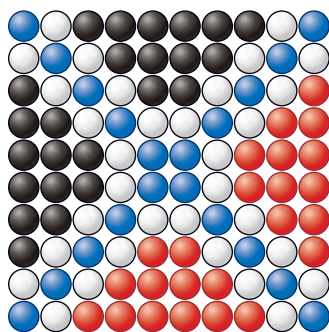
11. What fraction with a numerator of 1 or 2 could you use to estimate each percent? Explain.

a) 30%

b) 15%

c) 70%

d) 9%



12. a) Describe each colour of beads as a percent of the entire design.

b) Write each percent as a fraction in lowest terms.

13. The air you breathe is 20 parts oxygen and 80 parts other gases.

a) What percent of the air is oxygen? What percent of the air is made up of other gases?

b) Write each percent as a fraction in lowest terms.

14. At a provincial campground, 25% of the sites are for tent camping, 60% are for RVs, and the rest are for groups.

a) What percent of the sites are for groups?

b) The campground has 152 sites. How many sites are for tent camping?

15. How do you know, without calculating, that the percent for $\frac{7}{25}$ is less than the percent for $\frac{7}{20}$?