



Modern Math Modules

Module 9

Percents in Real-Life

Grace bought a new house and paid $\frac{1}{4}$ of the asking price as a down payment. What percent of the total price did she use as a down payment?

PART 1

The Meaning of Percent

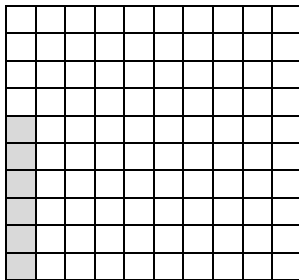
Consumers, students, employees, and business people use the word percent frequently in everyday life. We learn to recognize common percents:

- Consumers may purchase clothing at a 50% off sale. Students may receive a grade of 87% on a test.
- Employees are used to a 15% payroll deduction for income tax.
- Business owners may make a 20% profit each year.
- You may talk about a 90% chance of rain today.

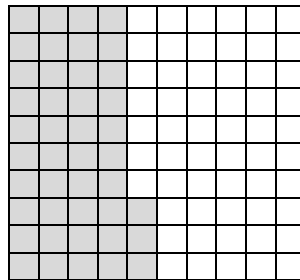
People use percents to give a quick comparison on a scale from 1 to 100.

Percent (%) means per hundred or hundredths.

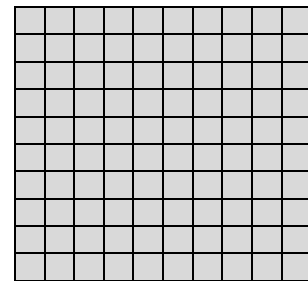
The place value models below are hundredths flats. You can use a percent to tell how much is shaded.



6 hundredths
6 out of 100
6% is shaded



43 hundredths
43 out of 100
43% is shaded



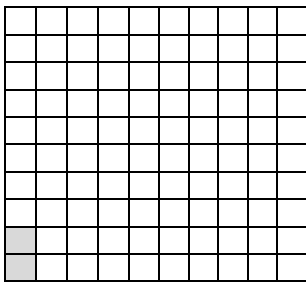
100 hundredths
100 out of 100
100% is shaded

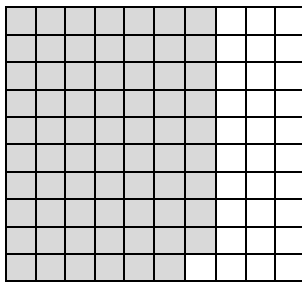
Example: Write the percent for 16 out of 100
16 out of 100 = 16 hundredths = 16%

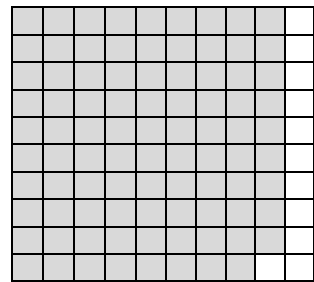
Example: Write the percent for $7\frac{1}{2}$ hundredths.
 $7\frac{1}{2}$ hundredths = $7\frac{1}{2}\%$

Part 1: The Meaning of Percents
Practice Your Skills

Exercise 1-A
What percent of each flat is shaded?







Exercise 1-B

Write the percent.

4. 10 out of 100 _____ 5. 13 out of 100 _____

6. 7 out of 100 _____ 7. 0 out of 100 _____

8. 98 out of 100 _____ 9. 67 out of 100 _____

10. 25 out of 100 _____ 11. 18 out of 100 _____

Real-Life Math

Exercise 1-C

This chart shows the favourite months to take vacation for 100 employees.

Use the chart to solve the problem.

Favourite Vacation Months

May	10
June	15
July	10
August	25
December	40

12. How many employees said July was their favourite month to vacation?

13. What percent of the employees said August was their favourite month to take a vacation? _____

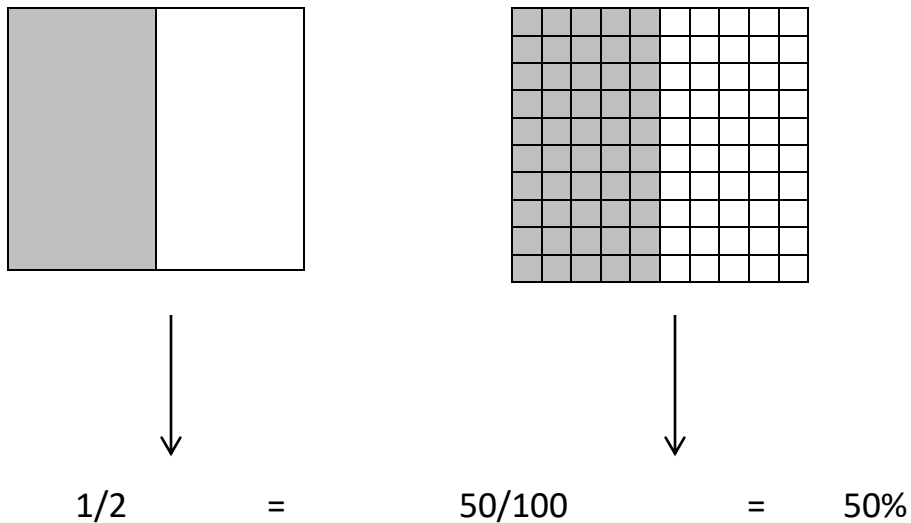
14. What percent of the employees said either May or June was their favourite months to vacation? _____

15. What month did most of the employees say was their favourite month to take a vacation? _____

PART 2

Fractions and Percents

Fractions can be written as percents.



When a fraction has a denominator of 100, just write the numerator with a percent symbol.

$$\frac{18}{100} = 18\% \quad \frac{89}{100} = 89\%$$

Example: Write $\frac{7}{20}$ as a percent.

When a fraction has a denominator other than 100, write an equivalent fraction with a denominator of 100.

$$\frac{7}{20} = \frac{7}{20} \times \frac{5}{5} = \frac{35}{100} = 35\%$$

You can also divide to write a fraction as a percent.

Example: write $17/25$ as a percent.

$$\begin{array}{r} \underline{\quad .68} = 68\% \\ 17/25 = 25 \overline{)17.00} \\ \underline{- 15 \ 0} \\ 2 \ 00 \\ \underline{- 2 \ 00} \\ 0 \end{array}$$

Step 1: Divide the numerator by the denominator. Remember, adding zeros after the last digit of a decimal does not change its value.

Step 2: Rewrite 68 hundredths as a percent.

PART 2: Fractions and Percents
Practice Your Skills

Exercise 2-A

Write as a percent.

1. $\frac{16}{100}$

2. $\frac{81}{100}$

3. $\frac{1}{100}$

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

5. $\frac{3}{4}$

6. $\frac{16}{16}$

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

8. $\frac{9}{20}$

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

10. $\frac{113}{100}$

11. $\frac{2}{5}$

12. $\frac{6}{25}$

Exercise 2-B

Write as a fraction.

13. 3% _____

14. 70% _____

15. 49% _____

16. 10% _____

17. 1% _____

18. 6% _____

19. 25% _____

20. 110% _____

21. 50% _____

22. 5% _____

23. 9% _____

24. 36% _____

25. 45% _____

26. 85% _____

27. 40% _____

Critical Thinking

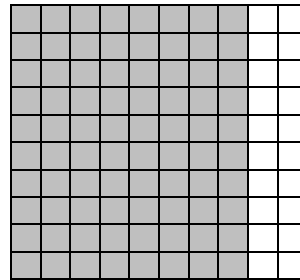
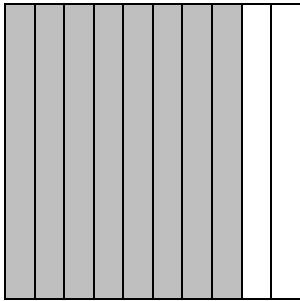
28. What whole number is 100% equal to? _____

29. Explain how you would determine if 24% is greater than or less than $\frac{6}{25}$

PART 3

Decimals and Percents

Decimals can be written as percents.



$$0.8 = 0.80 = 80/100 = 80\%$$

To write a decimal as a percent, express the decimal in hundredths.

Example: write 0.5 as a percent

$$\begin{aligned} 0.5 &= 50 \text{ hundredths} \\ 50 \text{ hundredths} &= 50\% \end{aligned}$$

Example: write 0.827 as a percent.

$$\begin{aligned} 0.827 & \text{ Move the decimal point two places to the right.} \\ \longrightarrow & \\ 0.827 & = 82.7\% \end{aligned}$$

To change a percent to a decimal, write the number without the percent sign and move the decimal point two places to the left.

Example: write 32% as a decimal.

$$32\% = 0.32 \text{ move the decimal point two places to the left.}$$

PART 3: Decimals and Percents
Practice Your Skills

Exercise 3-A

Write as a percent.

1. 0.9 _____

2. 0.17 _____

3. 0.6 _____

4. 0.04 _____

5. 0.387 _____

6. 0.09 _____

7. 0.517 _____

8. 0.23 _____

9. 0.5 _____

10. 0.1 _____

11. 0.492 _____

12. 0.111 _____

13. 0.70 _____

14. 0.825 _____

15. 0.4 _____

Exercise 3-B

Write as a decimal.

16. 37% _____

17. 98% _____

18. 3% _____

19. 42.9% _____

20. 63.1% _____

21. 14.2% _____

22. 2.9% _____

23. 85% _____

24. 9% _____

25. 4.3% _____

26. 24% _____

27. 1% _____

28. 6.3% _____

29. 84.9% _____

30. 3.7% _____

Calculating

You can use a calculator to help you find percents.

$$\frac{1}{3} = 1 \div 3 = 0.3333333 = 0.333 = 33.3\%$$

Write each fraction as a decimal and as a percent. Use a calculator.

31. $\frac{3}{8}$ _____

32. $\frac{7}{8}$ _____

33. $\frac{1}{6}$ _____

34. $\frac{1}{7}$ _____

PART 4

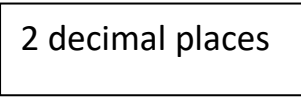
A Percent of a Number

A sweater that regularly sells for \$48 is on sale for 20% off. How much will the savings be?

To find out a percent of a number, write the percent as a decimal and multiply.

Step 1: $20\% = 0.20$

Step 2: $\begin{array}{r} \$48 \\ \times 0.20 \\ \hline 960 \\ \$9.60 \end{array}$



The savings on the sweater is \$9.60.

Example: Megan wants to spend 27% of her salary for child care. If she earns \$2,500 per month, how much can she afford to spend on child care?

To find out, write the percent as a fraction and multiply.

Step 1: $\frac{27}{100} \times \$2,500 = \frac{67500}{100} = 675$

Step 2: $27\% = \frac{27}{100}$

She can afford to pay \$675 per month.

Calculating

You can use the % key on a calculator to find a percent of a number.

Find: 30% of 80.

Press: $80 \times 30\% = 24$

PART 4: A Percent of a Number
Practice Your Skills

Exercise 4-A

Use a fraction to find the number.

1. 20% of 62 _____

2. 16% of 95 _____

3. 6% of 49 _____

4. 43% of 80 _____

5. 20% of 140 _____

6. 35% of 55 _____

7. 49% of 110 _____

8. 64% of 85 _____

9. 90% of 180 _____

10. 91% of 150 _____

Exercise 4-B

Use a decimal to find the number.

11. 10% of 190 _____

12. 47% of 74 _____

13. 62% of 145 _____

14. 92% of 180 _____

15. 75% of 150 _____

16. 27% of 550 _____

17. 19% of 100 _____

18. 83% of 91 _____

19. 42% of 80 _____

20. 8% of 25 _____

Calculating

Use the % key on a calculator to find the following numbers. Round your answers to the nearest tenth or cent.

21. 12 % of 55 _____

22. 19% of 80 _____

23. 14% of \$38.70 _____

24. 20% of \$229.99 _____

25. 80% of \$120.00 _____

26. 15% of 90 _____

PART 5

Problem Solving: Using Percent

The local bookstore offers a certain percent off the cost of books to regular customers. The decrease in price is called the discount. What is the final cost of a \$125 order with a 20% discount?

Step 1	Step 2	Step 3
20% = 0.20	$\begin{array}{r} \$125 \\ \times 0.20 \\ \hline 000 \\ 250 \\ \hline \$25.00 \end{array}$	$\begin{array}{r} \$125.00 \\ - 25.00 \\ \hline \$100.00 \end{array}$

Step 1: Write the percent as a decimal.

Step 2: Multiply the price of the books by the decimal.

Step 3: Subtract the discount from the original price.

The final cost is \$100.00

Example: Which is the better buy? A \$30 blender at a 25% discount or the same blender reduced by \$10?

Calculating

Step 1: Find the discounted price of the \$30 blender.

$$\text{Press: } 30 \times 25 \% = 7.5$$

$$30 - 7.5 = 22.50$$

The blender costs \$22.50

Step 2: Find the price of the blender reduced by \$10

$$30 - 10 = 20$$

The blender costs \$20.

The better buy is the blender reduced by \$10.

PART 5: Problem Solving Using Percent
Practice Your Skills

Real-Life Math

Exercise 5-A

Find the final price of each item.

1. 15% discount on a \$40 haircut.
2. 20% discount on a \$345 airline ticket.
3. 30% discount on a \$69.90 clock radio.
4. 25% discount on a \$559.50 washing machine.
5. 5% discount on a \$12,500 car.
6. 40% discount on a \$429.70 television.
7. 10% discount on a \$389.59 DVD player.
8. 45% discount on a \$30.35 concert ticket.

Real-Life Math

Exercise 5-B

Solve.

9. Gail works in a clothing store. She makes 10% commission on all of the goods she sells. Yesterday, she sold \$520 worth of goods. How much is her commission?
10. John and Jill go out for dinner. The bill is \$74.99. They leave a 15% tip. How much is the tip?

Exercise 5-C

Which is the better buy?

9. A \$16.50 compact disc reduced by \$2.00 or the same disc reduced 20%?

10. A \$140 telephone/answering machine at a 15% discount or a \$160 telephone/answering machine at a 25% discount?

11. A \$115 raincoat at 30% off or the same raincoat reduced by \$40?

Real-Life Math

Module #9 Task-Based Activity: Calculating simple interest

OALCF Connection

- A. Find and Use Information: A2. Interpret documents
- B. Communicate Ideas and Information: B3. Complete and create documents
- C. Understand and Use Numbers: C1. Manage money

A bank pays interest to each customer in return for using his money. Simple interest is the money paid to each customer on the principal, or money deposited into an account.

Example: June deposited \$2,500 in her savings account for 2 years. How much simple interest did the money earn at 7%?

To find out, multiply the principal by the interest rate per year and the time expressed in years (y).

$$\begin{array}{cccc} \text{Interest (I)} & = & \text{principal (p)} & \times \text{rate (r)} & \times \text{time (t)} \\ I & = & \$2,500 & \times 0.07 & \times 2 \end{array}$$

$$\begin{array}{r} \$2,500 \leftarrow \text{principal} \\ \times 0.07 \leftarrow \text{rate} \\ \hline 175.00 \\ \times 2 \leftarrow \text{time} \\ \hline \$350.00 \leftarrow \text{simple interest} \end{array}$$

The money earned \$350.00 in simple interest after 2 years.

Find the simple interest for each amount. Use $I = p \times r \times t$

Principal	Rate	Time	Interest
\$325	10%	2y	
\$500	6%	3y	
\$1,000	7%	2 ½ y	
\$1,450	9%	2y	
\$800	5%	4y	

**Module 9: Percents in Real-Life
Review**

Write the percent.

1. 3 out of 100 _____ 2. 16 out of 100 _____

3. 49 out of 100 _____ 4. 23 out of 100 _____

5. $\frac{13}{100}$ _____ 6. $\frac{62}{100}$ _____ 7. $\frac{2}{100}$ _____

8. $\frac{1}{25}$ _____ 9. $\frac{2}{5}$ _____ 10. $\frac{7}{10}$ _____

Write as a fraction in simplest form.

11. 5% _____ 12. 17% _____ 13. 35% _____

14. 8% _____ 15. 40% _____ 16. 29% _____

Write as a decimal.

17. 42% _____ 18. 4.7% _____ 19. 33.4% _____

20. 3.9% _____ 21. 6.3% _____ 22. 12% _____

Use a fraction or a decimal to find the number.

23. 18% of 40 _____ 24. 12% of 52 _____

25. 33% of 60 _____ 26. 20% of \$149.88 _____

Find the final price of each item.

27. 15% discount on a \$50 skirt _____

28. 20% discount on a \$69 sweater _____