

Lesson 6.4 Real-World Problems: Percent

Solve.

Example

A fruit display has 75 fruits. 30 of them are oranges and the rest are peaches.

- a) What percent of the fruits are oranges?

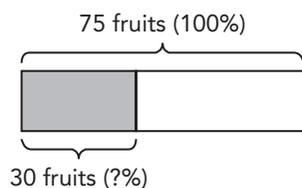
Method 1

$$\begin{aligned} \text{Fraction of the fruits that are oranges} &= \frac{\text{Number of oranges}}{\text{Total number of fruits}} \\ &= \frac{30}{75} \\ &= \frac{2}{5} \end{aligned}$$

$$\frac{2}{5} \times 100 \% = 40 \%$$

40% of the fruits are oranges.

Method 2



$$\underline{75} \text{ fruits} \rightarrow \underline{100} \%$$

$$\underline{1} \text{ fruit} \rightarrow \frac{100}{75} \%$$

$$\underline{30} \text{ fruits} \rightarrow \underline{30} \times \frac{100}{75} \% = \underline{40} \%$$

40% of the fruits are oranges.

- b) What percent of the fruits are peaches?

$$\underline{100} \% - \underline{40} \% = \underline{60} \%$$

60% of the fruits are peaches.

Name: _____

Date: _____

1. Denise sold 12 of the 40 quilts she made.

a) What percent of the quilts did Denise sell?

Method 1

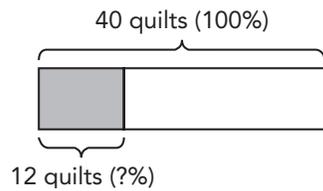
$$\text{Fraction of the quilts Denise sold} = \frac{\text{Number of quilts sold}}{\text{Total number of quilts}}$$

$$= \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}\% = \underline{\hspace{2cm}}\%$$

Denise sold _____% of the quilts.

Method 2



$$\underline{\hspace{2cm}} \text{ quilts} \rightarrow \underline{\hspace{2cm}}\%$$

$$\underline{\hspace{2cm}} \text{ quilt} \rightarrow \underline{\hspace{2cm}}\%$$

$$\underline{\hspace{2cm}} \text{ quilts} \rightarrow \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}\% = \underline{\hspace{2cm}}\%$$

Denise sold _____% of the quilts.

b) What percent of the quilts did Denise not sell?

$$\underline{\hspace{2cm}}\% - \underline{\hspace{2cm}}\% = \underline{\hspace{2cm}}\%$$

Denise did not sell _____% of the quilts.

Name: _____

Date: _____

2. 70 out of 350 calculators at a bookstore are scientific calculators.

a) What percent of the calculators are scientific calculators?

b) What percent of the calculators are not scientific calculators?

3. Of the 2,400 marathon participants, 1,800 of them wore headphones.

a) What percent of the participants wore headphones?

b) What percent of the participants did not wear headphones?

Name: _____

Date: _____

Solve.*Example*

Mason buys a suitcase that costs \$390. In addition, he has to pay 8% sales tax on his purchase. What is the total cost of the suitcase?

Method 1

$$\text{Sales tax} = \underline{8} \% \text{ of } \$ \underline{390}$$

$$= \frac{\underline{8}}{\underline{100}} \times \$ \underline{390}$$

$$= \$ \underline{31.20}$$

$$\$ \underline{390} + \$ \underline{31.20} = \$ \underline{421.20}$$

The total cost of the suitcase is \$ 421.20.

Method 2

Sales tax:

$$\underline{100} \% \rightarrow \underline{390}$$

$$\underline{1} \% \rightarrow \$ \frac{\underline{390}}{\underline{100}}$$

$$\underline{8} \% \rightarrow \underline{8} \times \$ \frac{\underline{390}}{\underline{100}} = \$ \underline{31.20}$$

$$\$ \underline{390} + \$ \underline{31.20} = \$ \underline{421.20}$$

The total cost of the suitcase is \$ 421.20.

Name: _____

Date: _____

4. Janice paid \$820 plus 7% sales tax for her airfare. How much did she pay in total for her airfare?

Method 1

Sales tax = _____% of \$_____

= _____ × \$_____

= \$_____

\$_____ + \$_____ = \$_____

Janice paid \$_____ in total for her airfare.

Method 2

Sales tax:

_____ % → \$_____

_____ % → \$_____

_____ % → _____ × \$_____ = \$_____

\$_____ + \$_____ = \$_____

Janice paid \$_____ in total for her airfare.

5. Jackie bought a collection of books for \$150. A sales tax of 8% was added to the price. How much did Jackie pay in all for the books?

6. Ms. Alice paid \$3,750 plus 7% sales tax on landing mats for a gymnastics club. How much did she pay in total for the landing mats?

Name: _____

Date: _____

Solve.

Example

An MP3 player costs \$40, and a sales tax of \$2.40 is added to the cost.

What is the sales tax rate?

The cost of the MP3 player is 100 %.

$$\text{\$ } \underline{40} \rightarrow \underline{100} \%$$

$$\text{\$ } \underline{1} \rightarrow \underline{\frac{100}{40}} \%$$

$$\text{\$ } \underline{2.40} \rightarrow \underline{2.40} \times \underline{\frac{100}{40}} \% = \underline{6} \%$$

The sales tax rate is 6 %.

7. Emily bought a DVD movie for \$25.50, and a sales tax of \$2.04 was added to the cost. What was the sales tax?

The cost of the DVD movie was _____ %.

$$\text{\$ } \underline{\quad\quad\quad} \rightarrow \underline{\quad\quad\quad} \%$$

$$\text{\$ } \underline{\quad\quad\quad} \rightarrow \underline{\quad\quad\quad} \%$$

$$\text{\$ } \underline{\quad\quad\quad} \rightarrow \underline{\quad\quad\quad} \times \underline{\quad\quad\quad} \% = \underline{\quad\quad\quad} \%$$

The sales tax rate was _____ %.

8. The sign in a shop shows the cost of a computer monitor and its sales tax.

Computer monitor	\$115.00
Sales tax	\$8.05

The sales tax was calculated based on the cost of the computer monitor.

What was the sales tax rate?

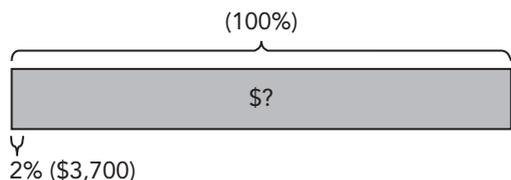
Name: _____

Date: _____

Solve.

Example

Scotty earns a 2% commission for all the cars he sells. If Scotty receives \$3,750 in commission, what is the dollar amount of his sales?



A salesperson earns a percent of the total sales made, which is called **commission**.

$$\underline{2} \% \rightarrow \$ \underline{3,750}$$

$$\underline{1} \% \rightarrow \$ \underline{3,750} \div \underline{2} = \$ \underline{1,875}$$

$$\underline{100} \% \rightarrow \underline{100} \times \$ \underline{1,875} = \$ \underline{187,500}$$

The dollar amount of his sales is \$187,500.

9. Catherine donates 5% of her salary to charity. If she donates \$285, how much is her salary?

$$\underline{\hspace{2cm}} \% \rightarrow \$ \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} \% \rightarrow \$ \underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \$ \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} \% \rightarrow \underline{\hspace{2cm}} \times \$ \underline{\hspace{2cm}} = \$ \underline{\hspace{2cm}}$$

Catherine's salary is \$_____.

10. An author receives a royalty of 8% on the sales of his book. If he receives \$11,000, what is the dollar amount of the book sales?

Name: _____

Date: _____

Solve.

Example

Belle deposits \$12,000 into her savings account at the beginning of the year. She will receive 3% interest at the end of the year. How much interest will Belle receive?

$$\begin{aligned}\text{Interest} &= \underline{3} \% \text{ of } \$\underline{12,000} \text{ for 1 year} \\ &= \frac{\underline{3}}{\underline{100}} \times \$\underline{12,000} \times \underline{1} \\ &= \$\underline{360}\end{aligned}$$

The amount of money earned from savings in a bank account or investments is called an **interest**.



Belle will receive \$ 360 in interest for the year.

11. Quincy has \$490 in his savings account at the beginning of the year. He will receive 2% interest at the end of the year. How much interest will Quincy receive?

$$\begin{aligned}\text{Interest} &= \underline{\hspace{2cm}} \% \text{ of } \$\underline{\hspace{2cm}} \text{ for 1 year} \\ &= \underline{\hspace{2cm}} \times \$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \\ &= \$\underline{\hspace{2cm}}\end{aligned}$$

Quincy will receive \$ in interest for the year.

12. Sara invested \$2,600 at the beginning of the year. The interest on her investment is 4% per year. How much interest will Sara receive for the year?

Name: _____

Date: _____

Solve.

Example

A company invested \$30,500 with a bank for $\frac{1}{2}$ year. The interest rate is 4% per year. How much interest will the company receive at the end of $\frac{1}{2}$ year?

$$\begin{aligned}\text{Interest} &= \frac{4}{100} \times \$30,500 \times \frac{1}{2} \\ &= \$610\end{aligned}$$

An **interest rate** is the rate at which your money earns interest in a given amount of time.



The firm will receive \$610 in interest at the end of $\frac{1}{2}$ year.

- 13.** Lionel has \$6,400 in his bank account at the beginning of the year. The interest rate is 3% per year. How much interest will he receive at the end of $\frac{1}{2}$ year?

$$\begin{aligned}\text{Interest} &= \underline{\hspace{2cm}} \times \$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \\ &= \$\underline{\hspace{2cm}}\end{aligned}$$

Lionel will receive \$_____ in interest at the end of $\frac{1}{2}$ year.

- 14.** A company has \$180,000 in its account. The interest rate is 5% per year. How much interest will it earn at the end of $\frac{1}{2}$ year?

$$19. 25.5\% = \frac{25.5}{100}$$

$$= \frac{255}{1,000}$$

$$= \frac{51}{200}$$

$$20. 6.02\% = \frac{6.02}{100}$$

$$= \frac{602}{10,000}$$

$$= \frac{301}{5,000}$$

$$21. \frac{89}{1,000}$$

$$22. \frac{1,517}{10,000}$$

$$23. \frac{137}{250}$$

$$24. \frac{1,387}{2,000}$$

Lesson 6.3

1. Method 1

The model shows that:

$$100\% \rightarrow 250$$

$$1\% \rightarrow \frac{250}{100} = 2.5$$

$$4\% \rightarrow 4 \times 2.5 = 10$$

4% of 250 is 10.

Method 2

$$4\% \text{ of } 250 = \frac{4}{100} \times 250$$

$$= 10$$

4% of 250 is 10.

2. Method 1

The model shows that:

$$100\% \rightarrow 550 \text{ kg}$$

$$1\% \rightarrow \frac{550}{100} = 5.5 \text{ kg}$$

$$12\% \rightarrow 12 \times 5.5 = 66 \text{ kg}$$

12% of 550 kilograms is 66 kilograms.

Method 2

$$12\% \text{ of } 550 \text{ kg} = \frac{12}{100} \times 550$$

$$= 66 \text{ kg}$$

12% of 550 kilograms is 66 kilograms.

$$3. 315$$

$$4. \$414$$

$$5. 369$$

$$6. 3,570 \text{ feet}$$

7. The model shows that:

$$12\% \rightarrow 36 \text{ people}$$

$$1\% \rightarrow \frac{36}{12} = 3 \text{ people}$$

$$100\% \rightarrow 100 \times 3 = 300 \text{ people}$$

There were 300 people at the movie theatre in all.

$$8. 40\% \rightarrow 520 \text{ biscuits}$$

$$1\% \rightarrow \frac{520}{40} = 13 \text{ biscuits}$$

$$100\% \rightarrow 100 \times 13 = 1,300 \text{ biscuits}$$

Jenny made 1,300 biscuits in all.

$$9. 500 \text{ eggs}$$

$$10. 600 \text{ stamps}$$

$$11. 40\% \rightarrow 180$$

$$1\% \rightarrow \frac{180}{40}$$

$$100\% \rightarrow 100 \times \frac{180}{40} = 450$$

The number is 450.

$$12. 75\% \rightarrow 230$$

$$1\% \rightarrow \frac{230}{75}$$

$$100\% \rightarrow 100 \times \frac{230}{75} = 306\frac{2}{3}$$

The number is 306 $\frac{2}{3}$.

$$13. 780$$

$$14. 125$$

Lesson 6.4

1. a) Method 1

Fraction of the quilts Denise sold

$$= \frac{\text{Number of quilts sold}}{\text{Total number of quilts}}$$

$$= \frac{12}{40}$$

$$= \frac{3}{10}$$

$$\frac{3}{10} \times 100\% = 30\%$$

Denise sold 30% of the quilts.

Method 2

$$40 \text{ quilts} \rightarrow 100\%$$

$$1 \text{ quilt} \rightarrow \frac{100\%}{40}$$

$$12 \text{ quilts} \rightarrow 12 \times \frac{100\%}{40} = 30\%$$

Denise sold 30% of the quilts.

$$b) 100\% - 30\% = 70\%$$

Denise did not sell 70% of the quilts.

$$2. a) 20\%$$

$$b) 80\%$$

$$3. a) 75\%$$

$$b) 25\%$$

4. Method 1

$$\text{Sales tax} = 7\% \text{ of } \$820$$

$$= \frac{7}{100} \times \$820$$

$$= \$57.40$$

$$\$820 + \$57.40 = \$877.40$$

Janice paid \$877.40 in total for her airfare.

Method 2

Sales tax:

$$100\% \rightarrow \$820$$

$$1\% \rightarrow \$ \frac{820}{100}$$

$$7\% \rightarrow 7 \times \$ \frac{820}{100} = \$57.40$$

$$\$820 + \$57.40 = \$877.40$$

Janice paid \$877.40 in total for her airfare.

5. \$162 6. \$4,012.50

7. The cost of the DVD movie was 100%.

$$\$25.50 \rightarrow 100\%$$

$$\$1 \rightarrow \frac{100}{25.50}\%$$

$$\$2.04 \rightarrow 2.04 \times \frac{100}{25.50}\% = 8\%$$

The sales tax rate was 8%.

8. 7%

9. 5% \rightarrow \$285

$$1\% \rightarrow \$285 \div 5 = \$57$$

$$100\% \rightarrow 100 \times \$57 = \$5,700$$

Catherine's salary is \$5,700.

10. \$137,500

11. Interest

$$= 2\% \text{ of } \$490 \text{ for 1 year}$$

$$= \frac{2}{100} \times \$490 \times 1$$

$$= \$9.80$$

Quincy will receive \$9.80 in interest for the year.

12. \$104

$$13. \text{ Interest} = \frac{2}{100} \times \$6,400 \times \frac{1}{2}$$
$$= \$96$$

Lionel will receive \$96 in interest at the end of $\frac{1}{2}$ year.

14. \$4,500

Lesson 6.5

1. Method 1

$$15\% \text{ of } \$2.20 = \frac{15}{100} \times \$2.20$$

$$= \$0.33$$

The price is marked up by \$0.33.

$$\$2.20 + \$0.33 = \$2.53$$

The selling price of the cereal is \$2.53.

Method 2

$$100\% \rightarrow \$2.20$$

$$1\% \rightarrow \$ \frac{2.20}{100}$$

$$15\% \rightarrow \$15 \times \$ \frac{2.20}{100} = \$0.33$$

The price is marked up by \$0.33.

$$\$2.20 + \$0.33 = \$2.53$$

The selling price of the cereal is \$2.53.

2. \$22.40 3. 75 pounds

4. \$1,386

5. a) $100\% - 60\% = 40\%$

$$40\% \rightarrow 900 \text{ g}$$

$$1\% \rightarrow \frac{900}{40} \text{ g}$$

$$100\% \rightarrow 100 \times \frac{900}{40} \text{ g} = 2,250 \text{ g}$$

The chef made 2,250 grams of dough at first.

- b) $100\% - 15\% = 85\%$

$$85\% \times 900 \text{ g}$$

$$= \frac{85}{100} \times 900 \text{ g}$$

$$= 765 \text{ g}$$

765 grams of dough was left after making the biscuits.

6. a) 500 stickers b) 150 stickers

7. $\$450 - \$396 = \$54$

The discount was \$54.

$$\$450 \rightarrow 100\%$$

$$\$1 \rightarrow \frac{100}{450}\%$$

$$\$54 \rightarrow 54 \times \frac{100}{450}\% = 12\%$$

The percent discount was 12%.

8. 40%

9. $\$104 - \$80 = \$24$

The increase in price was \$24.

$$\$80 \rightarrow 100\%$$

$$\$1 \rightarrow \frac{100}{80}\%$$

$$\$24 \rightarrow 24 \times \frac{100}{80}\% = 30\%$$

The percent increase in the price of the ring was 30%.

10. $49\frac{1}{11}\%$

11. a) Increase in the price of rug when Company A sold it to Company B

$$= \$90 - \$75$$

$$= \$15$$

$$\text{Percent increase} = \frac{15}{75} \times 100\%$$

$$= 20\%$$

The percent increase in the price of the rug when Company A sold it to Company B was 20%.