

Dear Family,

Throughout the next few weeks, our math class will be learning about percents. We will also be learning how to solve problems using percents written as ratios.

You can expect to see homework that provides practice with percents, fractions, and decimals in a variety of contexts.

Here is a sample of how your child was taught to solve a percent problem.



### MODEL Find the whole.

42 is 30% of what number?

#### STEP 1

Write the relationship among the percent, part, and whole. The percent is written as a ratio.

$$\text{percent} = \frac{\text{part}}{\text{whole}}$$

$$\frac{30}{100} = \frac{42}{\square}$$

#### STEP 2

Simplify the known ratio.

$$\frac{30 \div 10}{100 \div 10} = \frac{42}{\square}$$

$$\frac{3}{10} = \frac{42}{\square}$$

#### STEP 3

Write an equivalent ratio.

$$\frac{3 \times 14}{10 \times 14} = \frac{42}{\square}$$

$$\frac{42}{140} = \frac{42}{\square}$$

So, 42 is 30% of 140.

### Tips

#### Equivalent Ratios

You can find equivalent ratios by multiplying or dividing both quantities in a ratio by the same number.

For example,

$$\frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28}, \text{ so } \frac{3}{4} \text{ and } \frac{21}{28} \text{ are equivalent ratios.}$$

## Vocabulary

**equivalent ratios** Ratios that name the same comparison.

**percent** A ratio, or rate, that compares a number to 100.

**rate** A ratio that compares two quantities that have different units of measure.

**ratio** A comparison of two quantities by division.

## Activity

Gather loose change from around the house. Count the number of coins (not the value). Ask, "The number of coins is 30% of what number?" Find the answer and then try different percents. See who can get a whole number as their answer.

# Carta para la casa

Querida familia,

Durante las próximas semanas, en la clase de matemáticas aprenderemos sobre porcentajes. También aprenderemos a resolver problemas usando porcentaje escritos como razones.

Llevaré a la casa tareas para practicar porcentajes, fracciones y decimales en diversos contextos.

Este es un ejemplo de la manera como aprendimos a resolver un problema de porcentajes.

## Vocabulario

**razones equivalentes** Razones que nombran la misma comparación.

**porcentaje** Una razón, o tasa, que compara un número con 100.

**tasa** Una razón que compara dos cantidades que tienen unidades de medida distintas.

**razón** Una comparación entre dos cantidades hecha con una división.



### MODELO Hallar el entero.

¿42 es el 30% de qué número?

#### PASO 1

Escribe la relación entre porcentaje, la parte y el entero.

El porcentaje se escribe como una razón.

$$\text{porcentaje} = \frac{\text{parte}}{\text{entero}}$$

$$\frac{30}{100} = \frac{42}{\blacksquare}$$

#### PASO 2

Simplifica la razón conocida.

$$\frac{30 \div 10}{100 \div 10} = \frac{42}{\blacksquare}$$

$$\frac{3}{10} = \frac{42}{\blacksquare}$$

#### PASO 3

Escribe una razón equivalente.

$$\frac{3 \times 14}{10 \times 14} = \frac{42}{\blacksquare}$$

$$\frac{42}{140} = \frac{42}{\blacksquare}$$

Por lo tanto, 42 es el 30% de 140.

### Pistas

#### Razones equivalentes

Puedes hallar razones equivalentes multiplicando o dividiendo ambas cantidades en una razón entre el mismo número.

Por ejemplo,

$$\frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28}, \text{ por lo tanto } \frac{3}{4} \text{ y } \frac{21}{28} \text{ son razones equivalentes.}$$

## Actividad

Reúna cambio que encuentre por la casa. Cuente el número de monedas (no su valor). Pregunte: “¿El número de monedas es el 30% de qué número?”. Encuentren la respuesta y después practiquen con diferentes porcentajes. Miren quién puede obtener un número entero como respuesta.

Name \_\_\_\_\_

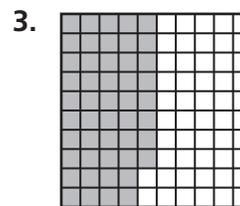
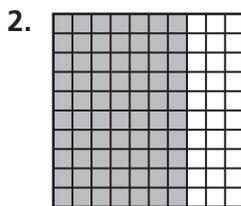
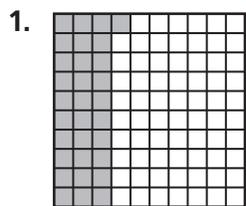
## Model Percents



**COMMON CORE STANDARD—6.RP.3C**

*Understand ratio concepts and use ratio reasoning to solve problems.*

Write a ratio and a percent to represent the shaded part.



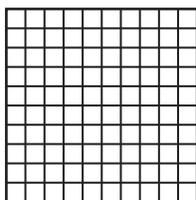
ratio:  $\frac{31}{100}$  percent: **31%**

ratio: \_\_\_\_\_ percent: \_\_\_\_\_

ratio: \_\_\_\_\_ percent: \_\_\_\_\_

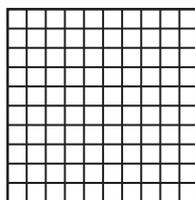
Model the percent and write it as a ratio.

4. 97%



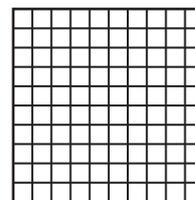
ratio: \_\_\_\_\_

5. 24%



ratio: \_\_\_\_\_

6. 50%



ratio: \_\_\_\_\_

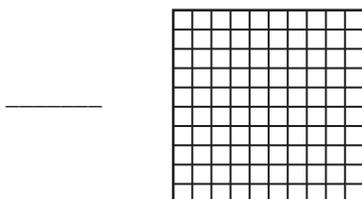
## Problem Solving



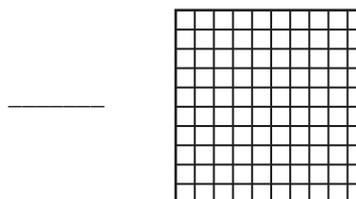
The table shows the pen colors sold at the school supply store one week. Write the ratio comparing the number of the given color sold to the total number of pens sold. Then shade the grid.

Pens Sold	
Color	Number
Blue	36
Black	49
Red	15

7. Black

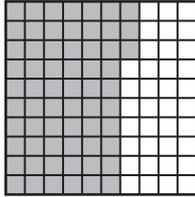


8. Not blue



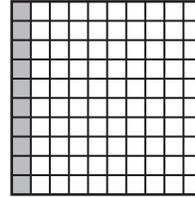
## Lesson Check (6.RP.3c)

1. What percent of the large square is shaded?



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2. What is the ratio of shaded squares to unshaded squares?



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## Spiral Review (6.RP.3a, 6.NS.6a, 6.NS.6c, 6.NS.8)

3. Write a number that is less than  $-2\frac{4}{5}$  and greater than  $-3\frac{1}{5}$ .

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4. On a coordinate grid, what is the distance between  $(2, 4)$  and  $(2, -3)$ ?

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5. Each week, Diana spends 4 hours playing soccer and 6 hours babysitting. Write a ratio to compare the time Diana spends playing soccer to the time she spends babysitting.

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6. Antwone earns money at a steady rate mowing lawns. The points  $(1, 25)$  and  $(5, 125)$  appear on a graph of the amount earned versus number of lawns mowed. What are the coordinates of the point on the graph with an  $x$ -value of 3?

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Name \_\_\_\_\_

## Write Percents as Fractions and Decimals



**COMMON CORE STANDARD—6.RP.3C**  
*Understand ratio concepts and use ratio reasoning to solve problems.*

Write the percent as a fraction or mixed number.

1. 44%

$$44\% = \frac{44}{100}$$

$$= \frac{11}{25}$$

2. 32%

\_\_\_\_\_

3. 116%

\_\_\_\_\_

4. 250%

\_\_\_\_\_

5. 0.3%

\_\_\_\_\_

6. 0.4%

\_\_\_\_\_

7. 1.5%

\_\_\_\_\_

8. 12.5%

\_\_\_\_\_

Write the percent as a decimal.

9. 63%

\_\_\_\_\_

10. 90%

\_\_\_\_\_

11. 110%

\_\_\_\_\_

12. 8%

\_\_\_\_\_

13. 42.15%

\_\_\_\_\_

14. 2.5%

\_\_\_\_\_

15. 0.1%

\_\_\_\_\_

16. 22.1%

\_\_\_\_\_

### Problem Solving



17. An online bookstore sells 0.8% of its books to foreign customers. What fraction of the books are sold to foreign customers?

\_\_\_\_\_

18. In Mr. Klein's class, 40% of the students are boys. What decimal represents the portion of the students that are girls?

\_\_\_\_\_

## Lesson Check (6.RP.3c)

- The enrollment at Sonya's school this year is 109% of last year's enrollment. What decimal represents this year's enrollment compared to last year's?
- An artist's paint set contains 30% watercolors and 25% acrylics. What fraction represents the portion of the paints that are watercolors or acrylics? Write the fraction in simplest form.

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## Spiral Review (6.RP.3a, 6.RP.3c, 6.NS.7a, 6.NS.7b, 6.NS.8)

- Write the numbers in order from least to greatest.  
 $-5.25$      $1.002$      $-5.09$
- On a coordinate plane, the vertices of a rectangle are  $(2, 4)$ ,  $(2, -1)$ ,  $(-5, -1)$ , and  $(-5, 4)$ . What is the perimeter of the rectangle?

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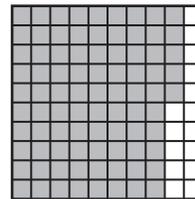
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- The table below shows the widths and lengths, in feet, for different playgrounds. Which playgrounds have equivalent ratios of width to length?

	A	B	C	D
Width	12	15	20	16.5
Length	20	22.5	25	27.5

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- What percent represents the shaded part?




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Name \_\_\_\_\_

**Write Fractions and Decimals as Percents****COMMON CORE STANDARD—6.RP.3C**  
*Understand ratio concepts and use ratio reasoning to solve problems.***Write the fraction or decimal as a percent.**

1.  $\frac{7}{20}$

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

3.  $\frac{1}{25}$

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

$$\frac{7}{20} = \frac{7 \times 5}{20 \times 5}$$

$$= \frac{35}{100} = 35\%$$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. 0.622

6. 0.303

7. 0.06

8. 2.45

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Write the number in two other forms (fraction, decimal, or percent).**

9.  $\frac{19}{20}$

10.  $\frac{9}{16}$

11. 0.4

12. 0.22

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Problem Solving**

13. According to the U.S. Census Bureau,  $\frac{3}{25}$  of all adults in the United States visited a zoo in 2007. What percent of all adults in the United States visited a zoo in 2007?

\_\_\_\_\_

14. A bag contains red and blue marbles. Given that  $\frac{17}{20}$  of the marbles are red, what percent of the marbles are blue?

\_\_\_\_\_

## Lesson Check (6.RP.3c)

1. The portion of shoppers at a supermarket who pay by credit card is 0.36. What percent of shoppers at the supermarket do NOT pay by credit card?
2. About  $\frac{23}{40}$  of a lawn is planted with Kentucky bluegrass. What percent of the lawn is planted with Kentucky bluegrass?

## Spiral Review (6.RP.1, 6.RP.2, 6.RP.3a, 6.RP.3c)

3. A basket contains 6 peaches and 8 plums. What is the ratio of peaches to total pieces of fruit?
4. It takes 8 minutes for 3 cars to move through a car wash. At the same rate, how many cars can move through the car wash in 24 minutes?
5. A 14-ounce box of cereal sells for \$2.10. What is the unit rate?
6. A model railroad kit contains curved tracks and straight tracks. Given that 35% of the tracks are curved, what fraction of the tracks are straight? Write the fraction in simplest form.

Name \_\_\_\_\_

**Percent of a Quantity****COMMON CORE STANDARD—6.RP.3C***Understand ratio concepts and use ratio reasoning to solve problems.*

Find the percent of the quantity.

1. 60% of 140

2. 55% of 600

3. 4% of 50

4. 50% of 82

$$60\% = \frac{60}{100}$$

$$\frac{60}{100} \times 140$$

$$= 84$$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. 10% of 2,350

6. 80% of 40

7. 160% of 30

8. 250% of 2

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. 105% of 260

10. 0.5% of 12

11. 40% of 16.5

12. 75% of 8.4

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Problem Solving**

13. The recommended daily amount of vitamin C for children 9 to 13 years old is 45 mg. A serving of a juice drink contains 60% of the recommended amount. How much vitamin C does the juice drink contain?

\_\_\_\_\_

14. During a 60-minute television program, 25% of the time is used for commercials and 5% of the time is used for the opening and closing credits. How many minutes remain for the program itself?

\_\_\_\_\_



Name \_\_\_\_\_

**Problem Solving • Percents**



**COMMON CORE STANDARD—6.RP.3C**

*Understand ratio concepts and use ratio reasoning to solve problems.*

**Read each problem and solve.**

1. On Saturday, a souvenir shop had 125 customers. Sixty-four percent of the customers paid with a credit card. The other customers paid with cash. How many customers paid with cash?

$$1\% \text{ of } 125 = \frac{125}{100} = 1.25$$

$$64\% \text{ of } 125 = 64 \times 1.25 = 80$$

$$125 - 80 = 45 \text{ customers}$$

2. A carpenter has a wooden stick that is 84 centimeters long. She cuts off 25% from the end of the stick. Then she cuts the remaining stick into 6 equal pieces. What is the length of each piece?

\_\_\_\_\_

3. Mike has \$136 to spend at the amusement park. He spends 25% of that money on his ticket into the park. How much does Mike have left to spend?

\_\_\_\_\_

4. A car dealership has 240 cars in the parking lot and 17.5% of them are red. Of the other 6 colors in the lot, each color has the same number of cars. If one of the colors is black, how many black cars are in the lot?

\_\_\_\_\_

5. The utilities bill for the Millers' home in April was \$132. Forty-two percent of the bill was for gas, and the rest was for electricity. How much did the Millers pay for gas, and how much did they pay for electricity?

\_\_\_\_\_

6. Andy's total bill for lunch is \$20. The cost of the drink is 15% of the total bill and the rest is the cost of the food. What percent of the total bill did Andy's food cost? What was the cost of his food?

\_\_\_\_\_

## Lesson Check (6.RP.3c)

1. Milo has a collection of DVDs. Out of 45 DVDs, 40% are comedies and the remaining are action-adventures. How many action-adventure DVDs does Milo own?
2. Andrea and her partner are writing a 12-page science report. They completed 25% of the report in class and 50% of the remaining pages after school. How many pages do Andrea and her partner still have to write?

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## Spiral Review (6.NS.7c, 6.RP.3a, 6.RP.3c)

3. What is the absolute value of  $-\frac{4}{25}$ ?
4. Ricardo graphed a point by starting at the origin and moving 5 units to the left. Then he moved up 2 units. What is the ordered pair for the point he graphed?
5. The population of birds in a sanctuary increases at a steady rate. The graph of the population over time has the points (1, 105) and (3, 315). Name another point on the graph.
6. Alicia's MP3 player contains 1,260 songs. Given that 35% of the songs are rock songs and 20% of the songs are rap songs, how many of the songs are other types of songs?

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Name \_\_\_\_\_

**Find the Whole From a Percent****COMMON CORE STANDARD—6.RP.3C***Understand ratio concepts and use ratio reasoning to solve problems.*

Find the unknown value.

1. 9 is 15% of 60

$$\frac{15}{100} = \frac{9}{\square}$$

$$\frac{15 \div 5}{100 \div 5} = \frac{3 \times 3}{20 \times 3} = \frac{9}{60}$$

2. 54 is 75% of \_\_\_\_\_

3. 12 is 2% of \_\_\_\_\_

4. 18 is 50% of \_\_\_\_\_

5. 16 is 40% of \_\_\_\_\_

6. 56 is 28% of \_\_\_\_\_

7. 5 is 10% of \_\_\_\_\_

8. 24 is 16% of \_\_\_\_\_

9. 15 is 25% of \_\_\_\_\_

10. 11 is 44% of \_\_\_\_\_

11. 19 is 95% of \_\_\_\_\_

12. 10 is 20% of \_\_\_\_\_

**Problem Solving**

13. Michaela is hiking on a weekend camping trip. She has walked 6 miles so far. This is 30% of the total distance. What is the total number of miles she will walk?

\_\_\_\_\_

14. A customer placed an order with a bakery for muffins. The baker has completed 37.5% of the order after baking 81 muffins. How many muffins did the customer order?

\_\_\_\_\_

## Lesson Check (6.RP.3c)

1. Kareem saves his coins in a jar. 30% of the coins are pennies. If there are 24 pennies in the jar, how many coins does Kareem have?
2. A guitar shop has 19 acoustic guitars on display. This is 19% of the total number of guitars. What is the total number of guitars the shop has?

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## Spiral Review (6.NS.6b, 6.RP.3a, 6.RP.3c)

3. On a coordinate grid, in which quadrant is the point  $(-5, 4)$  located?
4. A box contains 16 cherry fruit chews, 15 peach fruit chews, and 12 plum fruit chews. Which two flavors are in the ratio 5 to 4?

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5. During basketball season, Marisol made  $\frac{19}{25}$  of her free throws. What percent of her free throws did Marisol make?
6. Landon is entering the science fair. He has a budget of \$115. He has spent 20% of the money on new materials. How much does Landon have left to spend?

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