North Penn School District

Elementary Math Parent Letter

Grade 6

Unit 2 – Chapter 5: Percents

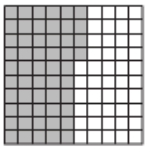
Examples for each lesson:

Lesson 5.1

Model Percents

A **percent** is a ratio that compares a number to 100. It represents part of a whole.

Model 54% on the 10-by-10 grid. Then write the percent as a ratio.



Step 1 The grid represents 1 whole. It has 100 equal parts. To show 54%, shade 54 of the 100 equal parts.

Step 2 A ratio can be written as a fraction. Write the number of shaded parts, 54, in the numerator. Write the total number of parts in the whole, 100, in the denominator.

shaded → $\frac{54}{100}$
total →

So, 54% is 54 out of 100 squares shaded, or $\frac{54}{100}$.

Lesson 5.2

Write Percents as Fractions and Decimals

You can write a percent as a decimal and a fraction.

Write 140% as a decimal and as a fraction in simplest form.

Step 1 Write 140% as a decimal by changing the percent sign to a decimal point and moving it two places to the left.

$140\% = 140 = 1.40$

Step 2 Write 140% as a fraction by removing the percent sign and placing 140 in the numerator. Since percent means out of 100, place 100 in the denominator.

$140\% = \frac{140}{100}$

Step 3 Simplify.

$\frac{140}{100} = \frac{7}{5}$, or $1\frac{2}{5}$

So, $140\% = 1.40 = \frac{7}{5}$, or $1\frac{2}{5}$.

More information on this strategy is available on Animated Math Model #16.

Lesson 5.3

Write Fractions and Decimals as Percents

You can write fractions and decimals as percents.

To write a decimal as a percent, multiply the decimal by 100 and write the percent symbol.

$0.073 = 7.3\%$ ← To multiply by 100, move the decimal point two places to the right.

To write a fraction as a percent, divide the numerator by the denominator. Then write the decimal as a percent.

To write $\frac{3}{8}$ as a percent, first divide 3 by 8.

```
  0.375
8)3.000
 −24
  60
 −56
  40
 −40
   0
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So, $\frac{3}{8} = 0.375$.

$0.375 = 37.5\%$ ← To write 0.375 as a percent, multiply by 100 and write the percent symbol.

More information on this strategy is available on Animated Math Model #16.

Lesson 5.4

Percent of a Quantity

You can use ratios to write a percent of a quantity.

Find 0.9% of 30.

Step 1 Write the percent as a rate per 100. $0.9\% = \frac{0.9}{100}$

Step 2 Multiply by a fraction equivalent to 1 to get a whole number in the numerator. $\frac{0.9}{100} \times \frac{10}{10} = \frac{9}{1{,}000}$

Step 3 Write the multiplication problem. $\frac{9}{1{,}000} \times 30$

Step 4 Multiply. $\frac{9}{1{,}000} \times 30 = \frac{27}{100} = 0.27$

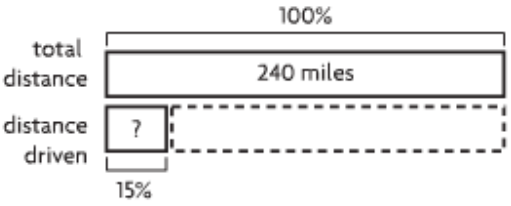
So, 0.9% of 30 is 0.27.

Lesson 5.5

Problem Solving • Percents

Use a model to solve the percent problem.

Lucia is driving to visit her parents, who live 240 miles away from her house. She has already driven 15% of the distance. How many miles does she still have to drive?

Read the Problem	Solve the Problem
What do I need to find? _____ _____ _____	Use a bar model to help. Draw a bar to represent the total distance. Then draw a bar that represents the distance driven plus the distance left. 
What information do I need to use? _____ _____ _____	The model shows that 100% = _____ miles, so 1% of 240 = $\frac{240}{100}$ = _____ miles. 15% of 240 = 15 × _____ = _____
How will I use the information? _____ _____ _____ _____	So, Lucia has already driven _____ miles. She still has to drive 240 − _____ = _____ miles.

Lesson 5.6

Find the Whole From a Percent

You can use equivalent ratios to find the whole, given a part and the percent.

54 is 60% of what number?

Step 1 Write the relationship among the percent, part, and whole. The percent is 60%. The part is 54. The whole is unknown.

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

$$60\% = \frac{54}{\square}$$

Step 2 Write the percent as a ratio.

$$\frac{60}{100} = \frac{54}{\square}$$

Step 3 Simplify the known ratio.

- Find the greatest common factor (GCF) of the numerator and denominator.

$$60 = \mathbf{2} \times \mathbf{2} \times 3 \times \mathbf{5}$$
$$100 = \mathbf{2} \times \mathbf{2} \times \mathbf{5} \times 5 \longrightarrow \text{GCF} = \mathbf{2} \times \mathbf{2} \times \mathbf{5} = 20$$

- Divide both the numerator and denominator by the GCF.

$$\frac{60 \div 20}{100 \div 20} = \frac{54}{\square}$$

$$\frac{3}{5} = \frac{54}{\square}$$

Step 4 Write an equivalent ratio.

- Look at the numerators. *Think:* $3 \times 18 = 54$
- Multiply the denominator by 18 to find the whole.

$$\frac{3 \times \mathbf{18}}{5 \times \mathbf{18}} = \frac{54}{\square}$$

So, 54 is 60% of 90.

$$\frac{54}{90} = \frac{54}{\square}$$

Vocabulary

Percent – a ratio of a number to 100

Equivalent fractions – two or more fractions that name the same amount

Equivalent ratios – ratios that name the same comparison

Ratio – a comparison of two quantities using division

Simplify – to write a fraction or a ratio so that the numerator and denominator have only 1 as a common factor