OBJECTIVES

You will learn how to think about percentages and use them in reasoning.
You will learn how to find the percent (m).

VOCABULARY

percent – a ratio that compares a number to 100; percent means "of 100" or "out of 100"

percent of a number – a fraction or a decimal expressed as a percent

type 1 problem – one of three types of missing element problems with percentages where the percent is missing

THINGS TO THINK ABOUT

The **percent of a number** is an important use of percentages. Remember that **percent** means "of 100." A percent compares any amount to 100.

We use percentages every day. Think about the weather forecast. If there was a 90% chance of rain, a picnic would probably be cancelled. It means that out of 100 chances, 90 chances would be rainy and 10 chances would not be rainy. However, if there was a 20% chance of rain, the picnic would not be cancelled. It means that out of 100 chances, only 20 would be rainy and 80 would not be rainy.

Percents are really ideas. Half of something is shown as 50%, but it is also shown as the fraction $\frac{1}{2}$ and the decimal 0.5. We may use either the percent, fraction, or decimal to compute with depending on what kind of answer we need.

LEARNING

When we say "percent of a number," it is easiest to think of simple examples. For instance, 50% means half. So, 50% of 30 would be 15, or half of 30. If it rained 50% of the days in June, it rained 15 days, because there are 30 days in June. The problem would be set up as 50% of 30 days = 15 days.

There are three types of problems that you will solve. Each type is based on what part of the equation is missing.

Where m = percent

m% of 30 = 15

Solve by division.

Where w = whole

50% of w = 15

Solve by division.

Where p = part

50% of 30 = p

Solve by multiplication.

In general, m% of w = p, or the percent of the whole equals the part.

It's easy to change percents to decimals. That's why decimals are usually used. To change a percent to a decimal, think about the meaning of a percent like 40%. The 40% means "40 out of 100." The decimal that also means 40 out of 100, or 40 hundredths, is 0.40. By simply removing the percent sign and moving the decimal point two times to the left, we can write the equivalent decimal.

40% = 40% = 0.40

Think about our sample problem: m% of 30 = 15. The first part of the problem is missing. So, we will call this a **type 1 problem** or missing percent problem. The problem is asking, "What percent of 30 is 15?" Remember that the word "of" means "multiply" in a problem sequence.

m% x 30 = 15

Let's use a simpler problem to model and understand the above example. Study the number sentence on the right.

2 x 3 = 6

Let's make the first factor the "missing" operator.

m x 3 = 6

How do you find m? Divide 6 by 3 (6 ÷ 3), which equals 2, the known answer. Transfer that pattern to the sample problem m% x 30 = 15. Divide 15 by 30 to find m%.

$$\begin{array}{r} 0.50 \\ 30\overline{)15.00} \\ -\,150 \\ \hline 00 \\ -\,0 \\ \hline 0 \end{array}$$

Add a decimal point and two zeros to the dividend. Show the quotient to the hundredths.

Since 0.50 is 50 hundredths, just reverse the process to write the decimal as a percent. Move the decimal point two places to the right and add the percent sign for the answer.

0.50 = 50%
>>

Name:_____ Date:_____

Directions: Write each decimal as a percent.

1. 0.45 _____

2. 0.23 _____

3. 0.05 _____

4. 1.23 _____

5. 0.091 _____

6. 0.454 _____

Directions: Write each percentage as a decimal.

7. 145% _____

8. 66% _____

9. 12% _____

10. 34.5% _____

11. 25% _____

12. 4.2% _____

Directions: Solve each problem for m, the missing percent.

13. m% of 200 = 120

m% = _____

14. m% of 15 = 3

m% = _____

15. m% of 500 = 5

m% = _____

Unit 1 | **Lesson 1.1**
Finding the Percent – Worksheet B

Directions: Solve each problem for m, the missing percent.

1. m% of 50 = 20

m% = _____

2. m% of 120 = 48

m% = _____

3. m% of 60 = 9

m% = _____

4. m% of 30 = 7.5

m% = _____

5. m% of 96 = 19.2

m% = _____

6. m% of 50 = 120

m% = _____

Directions: Solve the problems below.

7. Mr. Gardner is buying a car that sells for $14,000. He was allowed $4,900 for his current car. What percent of the new car's price was he allowed for his current car?

8. There are 60 students in the junior high school. Today, 9 students are absent. What percent of the students in the junior high school are absent?

For extra practice, go to page 68.