

Warm up!

11. 45 is what percent of 60?
13. 0.8% of 150 is what number?
15. 0.5% of what number is 12?
17. 120% of what number is 102?

15.4 Record and Practice Journal

Write and solve an equation to answer the question.

1. What number is 35% of 80?

$$a = 0.35 \cdot 80; 28$$

2. 8 is what percent of 5?

$$8 = p \cdot 5; 160\%$$

3. What percent of 125 is 50?

$$50 = p \cdot 125; 40\%$$

4. 12% of what number is 48?

$$48 = 0.12 \cdot w; 400$$

5. 12 is what percent of 50?

$$12 = p \cdot 50; 24\%$$

6. What percent of 12 is 3?

$$3 = p \cdot 12; 25\%$$

7. You receive 15% of the profit from a car wash. How much money do you receive from a profit of \$300?

$$\$45$$



Essential Question What is a percent of decrease? What is a percent of increase?

A **percent of change** is the percent that a quantity changes from the original amount.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original amount}}$$

Key Idea

Percents of Increase and Decrease

When the original amount increases, the percent of change is called a **percent of increase**.

$$\text{percent of increase} = \frac{\text{new amount} - \text{original amount}}{\text{original amount}}$$

When the original amount decreases, the percent of change is called a **percent of decrease**.

$$\text{percent of decrease} = \frac{\text{original amount} - \text{new amount}}{\text{original amount}}$$

1 Finding a Percent of Increase

The table shows the numbers of hours you spent online last weekend. What is the percent of change in your online time from Saturday to Sunday?

Day	Hours Online
Saturday	2
Sunday	4.5

The number of hours on Sunday is greater than the number of hours on Saturday. So, the percent of change is a percent of increase.

$$\text{percent of increase} = \frac{\text{new amount} - \text{original amount}}{\text{original amount}}$$

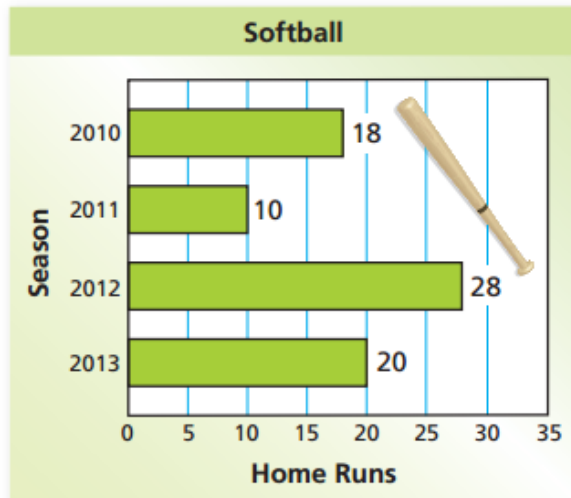
The number of hours on Sunday is greater than the number of hours on Saturday. So, the percent of change is a percent of increase.

$$\begin{aligned}\text{percent of increase} &= \frac{\text{new amount} - \text{original amount}}{\text{original amount}} \\ &= \frac{4.5 - 2}{2} && \text{Substitute.} \\ &= \frac{2.5}{2} && \text{Subtract.} \\ &= 1.25, \text{ or } 125\% && \text{Write as a percent.}\end{aligned}$$

❖ So, your online time increased 125% from Saturday to Sunday.

EXAMPLE 2 Finding a Percent of Decrease

The bar graph shows a softball player's home run totals. What was the percent of change from 2012 to 2013?



The number of home runs decreased from 2012 to 2013. So, the percent of change is a percent of decrease.

$$\text{percent of decrease} = \frac{\text{original amount} - \text{new amount}}{\text{original amount}}$$

$$= \frac{28 - 20}{28} \quad \text{Substitute.}$$

$$= \frac{8}{28} \quad \text{Subtract.}$$

$$\approx 0.286, \text{ or } 28.6\% \quad \text{Write as a percent.}$$

So, the number of home runs decreased about 28.6%.

**Study Tip**

The amount of error is always positive.

**Key Idea****Percent Error**

A **percent error** is the percent that an estimated quantity differs from the actual amount.

$$\text{percent error} = \frac{\text{amount of error}}{\text{actual amount}}$$

EXAMPLE 3 Finding a Percent Error

You estimate that the length of your classroom is 16 feet. The actual length is 21 feet. Find the percent error.

The amount of error is $21 - 16 = 5$ feet.

$$\text{percent error} = \frac{\text{amount of error}}{\text{actual amount}} \quad \text{Write percent error equation.}$$

$$= \frac{5}{21} \quad \text{Substitute.}$$

$$\approx 0.238, \text{ or } 23.8\% \quad \text{Write as a percent.}$$

❖ The percent error is about 23.8%.

Complete Page
680 #
4,6,8,10,12,14,16,
18,24,26

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