



# What Are Percentages?

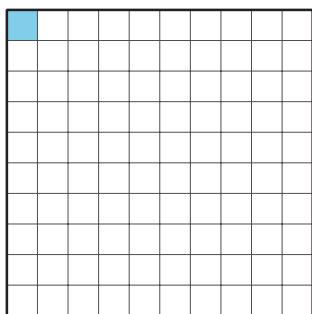
Let's learn about percentages.

## 10.1

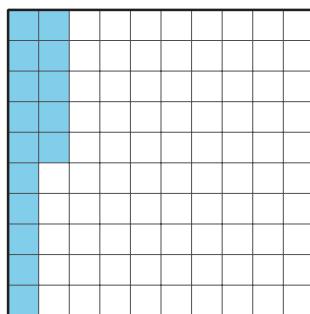
## A Large Square of 100 Square Units

1. A large square represents an area of 100 square units. How many square units are shaded in each diagram?

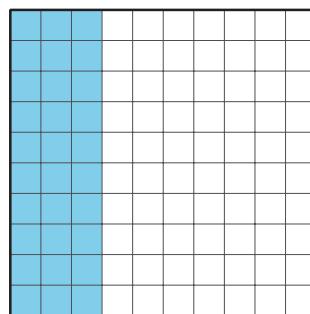
A



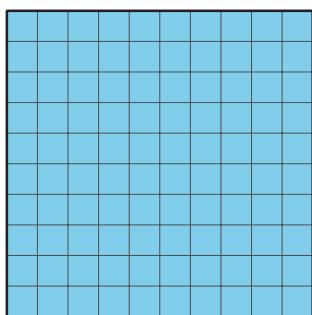
B



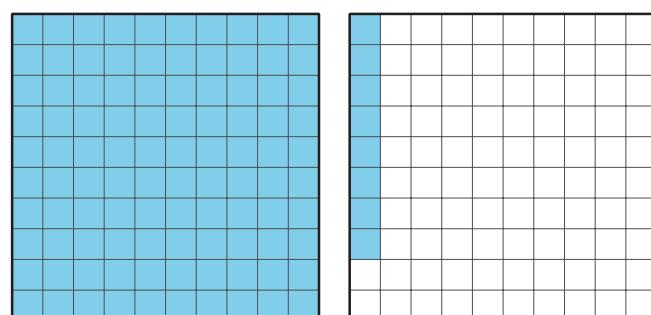
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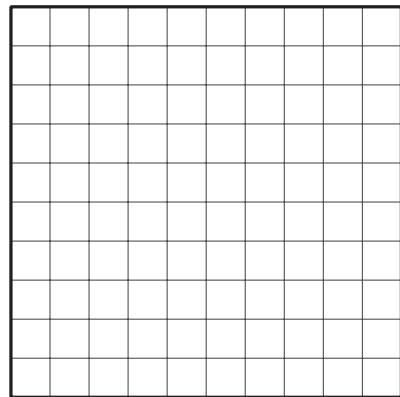
E



Pause here so your teacher can review your work.

2. We can say that “1 **percent** of the large square” is shaded in Diagram A and “15 percent of the large square” is shaded in Diagram B.

Shade 50 percent of the area of the large square.



## 10.2 Coins

Here are the names and values of some U.S. coins.



penny

1 cent



nickel

5 cents



dime

10 cents



quarter

25 cents



half dollar

50 cents



dollar

1 dollar

Here are some ways to describe the coins' values using percent (%):

- The value of a dime is 10 percent of a dollar.
- The value of a quarter is 25 percent of a dollar.
- The value of 5 dimes is 50 percent of a dollar.

1. Describe the value of each coin using “percent of a dollar.”
  - a. A penny
  - b. A nickel
  - c. A half dollar
  - d. A dollar

2. Jada has two coin collections. Each collection has the same type of coins.
  - a. Her first collection of coins is worth 105 percent of a dollar. What is the value of this collection?
  - b. Her second collection of coins is worth \$2.00. What percent of a dollar is that?
3. Write a definition for “percent” based on your understanding now.

 **Are you ready for more?**

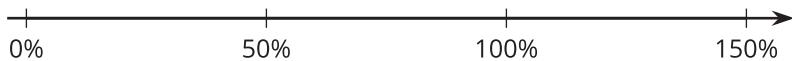
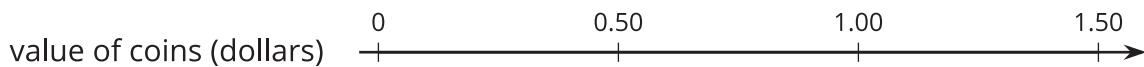
Find two different sets of coins that each make 120% of a dollar, where no type of coin is in both sets.

## 10.3

## Coins on a Double Number Line Diagram

Double number line diagrams can help us think about percentages.

1. Here is a diagram that can represent the value of money as a percentage of a dollar.

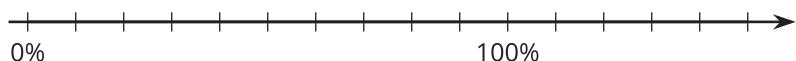
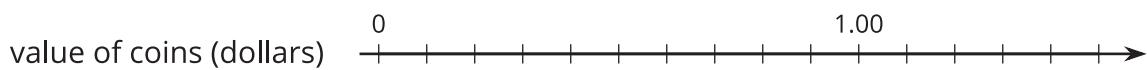


a. The value of 2 quarters is 50 percent of a dollar. How can you see that in the diagram?

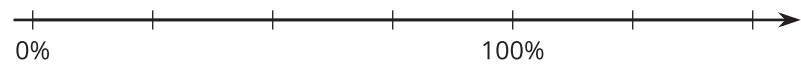
b. Label the diagram to show the values of 1 quarter and 3 quarters. What percent are they of a dollar?

2. For each question, use the double number line diagram to show your reasoning.

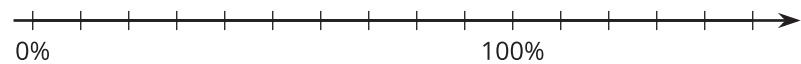
a. Clare has 6 dimes in her pocket. What percentage of a dollar does she have?



b. Han has 6 quarters in his pocket. What percentage of a dollar does he have?



c. Which has a greater value: 8 nickels or 40% of a dollar?



## Lesson 10 Summary

**Percent** means “per 100.” A **percentage** is a *rate per 100*.

We can use percentages to describe the relationship between two quantities. For instance:

- The value of a quarter is 25 percent of a dollar because there are 25 cents in a quarter per 100 cents in a dollar. The ratio of their values is 25 to 100.
- The value of a half-dollar coin is 50 percent of a dollar because there are 50 cents in a half-dollar coin per 100 cents in a dollar. The ratio of their values is 50 to 100.
- The value of five quarters is 125 percent of a dollar because there are 125 cents in five quarters per 100 cents in a dollar. The ratio of their values is 125 to 100.

Here is a double number line diagram that can represent these coin values. Because we’re representing percentages of a dollar, 100% is aligned to \$1 on the number line.

