



# Finding the Percentage

Let's find percentages in general.

## 16.1 Math Talk: Fractions and Decimals

Decide mentally if each equation is true or false.

- $\frac{1}{5} = \frac{2}{10}$

- $\frac{3}{5} = 0.35$

- $\frac{6}{5} = \frac{120}{100}$

- $\frac{11}{20} = 0.55$



## 16.2 Jumping Rope

In a jump-rope contest, four students have a goal of jumping rope for 20 minutes.

- Diego jumped rope for 20 minutes.
- Jada jumped rope for 15 minutes.
- Lin jumped rope for 24 minutes.
- Noah jumped rope for 9 minutes.



1. Answer each question, and record it in the table.
  - What percentage of the goal did each student reach?
  - What fraction of the goal did each student reach?
  - Write each fraction of the goal in decimal form.

|       | time<br>(minutes) | percentage<br>of goal | fraction<br>of goal | fraction in<br>decimal form |
|-------|-------------------|-----------------------|---------------------|-----------------------------|
| Diego |                   |                       |                     |                             |
| Jada  |                   |                       |                     |                             |
| Lin   |                   |                       |                     |                             |
| Noah  |                   |                       |                     |                             |

2. What do you notice about the numbers in “percentage of goal” and “fraction in decimal form” columns?
3. Han jumped for  $t$  minutes. Write an expression that shows:
  - The fraction of the goal he reached.
  - The percentage of the goal he reached.

## 16.3

## Restaurant Capacity

A restaurant has a sign by the front door that says, "Maximum occupancy: 75 people."

Answer each question and explain or show your reasoning.

1. What percentage of its capacity is 9 people?
2. What percentage of its capacity is 51 people?
3. What percentage of its capacity is 84 people?



### Are you ready for more?

Of all the Earth's water, 96% is salt water in oceans and 4% is fresh water in lakes, rivers, glaciers, and polar ice caps.

The total volume of water on Earth is 1,386 million  $\text{km}^3$ .

1. What is the volume of salt water?
2. What is the volume of fresh water?



## Lesson 16 Summary

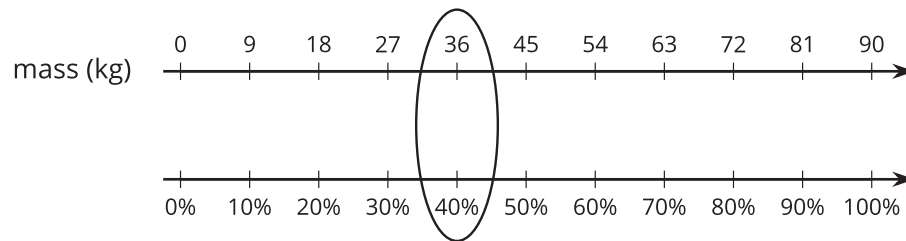
What percentage of 90 kg is 36 kg?

One way to solve this problem is to first find what percentage 1 kg is of 90, and then multiply by 36.

| mass (kg) | percentage                |
|-----------|---------------------------|
| 90        | 100                       |
| 1         | $\frac{1}{90} \cdot 100$  |
| 36        | $\frac{36}{90} \cdot 100$ |

$\cdot \frac{1}{90}$  (from 90 to 1)  
 $\cdot 36$  (from 1 to 36)  
 $\cdot \frac{1}{90}$  (from 100 to  $\frac{1}{90} \cdot 100$ )  
 $\cdot 36$  (from  $\frac{1}{90} \cdot 100$  to  $\frac{36}{90} \cdot 100$ )

From the table we can see that 1 kg is  $(\frac{1}{90} \cdot 100)\%$ , so 36 kg is  $(\frac{36}{90} \cdot 100)\%$  or 40% of 90. We can confirm this on a double number line diagram:



In general, to find what percentage a number  $C$  is of another number  $B$ , find  $\frac{C}{B}$  of 100%, or calculate  $\frac{C}{B} \cdot 100$ .

Suppose a school club has raised \$88 for a project but needs a total of \$160. What percentage of its goal has the club raised?

To find what percentage \$88 is of \$160, we find  $\frac{88}{160}$  of 100% or  $\frac{88}{160} \cdot 100$ , which equals  $\frac{11}{20} \cdot 100$ , or 55. The club has raised 55% of its goal.