Unit 3, Lesson 16

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-roping 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 (minutes)	percentage of goal	fraction of goal	fraction in 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.

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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 km^3.

1. What is the volume of salt water?

2. What is the volume of fresh water?

Lesson 16 Summary

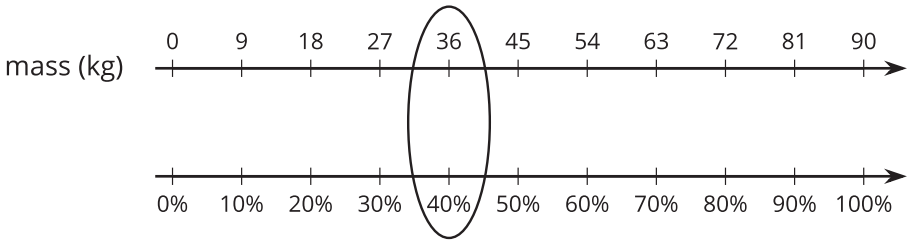
What percentage of 90 kg is 36 kg?

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	$\frac{36}{90} \cdot 100$

$\cdot \frac{1}{90}$ $\cdot 36$ $\cdot \frac{1}{90}$ $\cdot 36$

From the table we can see that 1 kg is $\left(\frac{1}{90} \cdot 100\right)\%$, so 36 kg is $\left(\frac{36}{90} \cdot 100\right)\%$ 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.

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