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.

- $\frac{1}{5} = \frac{2}{10}$
- $\frac{3}{5} = 0.35$
- $\frac{6}{5} = \frac{120}{100}$
- $\frac{11}{20} = 0.55$


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# 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?

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## Lesson 16 Summary

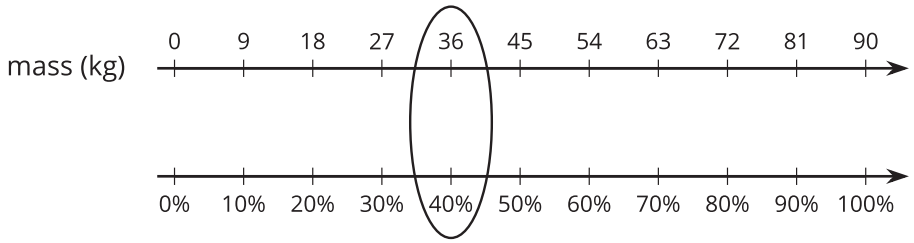
What percentage of 90 kg is 36 kg?

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

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

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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