NAME DATE PERIOD

Unit 3, Lesson 16: Finding the Percentage

Let's find percentages in general.

16.1: True or False: Percentages

Is each statement true or false? Be prepared to explain your reasoning.

1. 25% of 512 is equal to $\frac{1}{4} \cdot 500$.

2. 90% of 133 is equal to $(0.9) \cdot 133$.

3. 30% of 44 is equal to 3% of 440.

4. The percentage 21 is of 28 is equal to the percentage 30 is of 40.

16.2: Jumping Rope

A school held a jump-roping contest. Diego jumped rope for 20 minutes.

1. Jada jumped rope for 15 minutes. What percentage of Diego's time is that?

2. Lin jumped rope for 24 minutes. What percentage of Diego's time is that?

3. Noah jumped rope for 9 minutes. What percentage of Diego's time is that?

4. Record your answers in this table. Write the quotients in the last column as decimals.

	time (minutes)	percentage	time $\div$ 20
Diego	20	100	$\frac{20}{20} = 1$
Jada	15		$\frac{15}{20} =$
Lin	24		$\frac{24}{20} =$
Noah	9		$\frac{9}{20} =$

NAME DATE PERIOD

5. What do you notice about the numbers in the last two columns of the table?

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?

Water makes up about 71% of the Earth’s surface, while the other 29% consists of continents and islands. 96% of all the Earth’s water is contained within the oceans as salt water, while the remaining 4% is fresh water located in lakes, rivers, glaciers, and the polar ice caps.

If the total volume of water on Earth is 1,386 million cubic kilometers, what is the volume of salt water? What is the volume of fresh water?

NAME DATE PERIOD

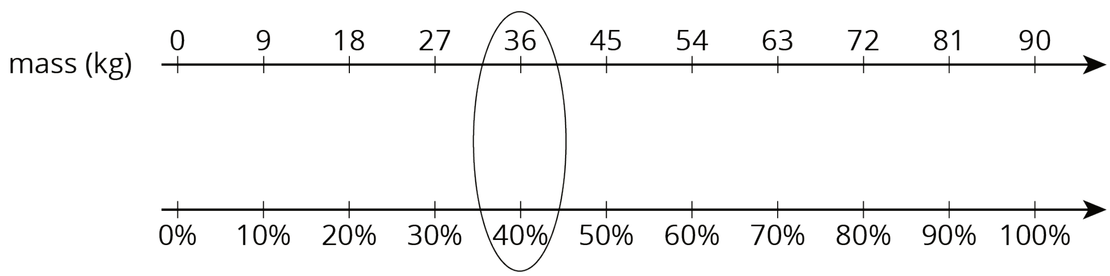
Lesson 16 Summary

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

(Arrows on both sides: $\cdot \frac{1}{90}$ from row 90 to row 1; $\cdot 36$ from row 1 to row 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:



In general, to find what percentage a number C is of another number B is to calculate $\frac{C}{B}$ of 100%. We can find do that by multiplying:

$$\frac{C}{B} \cdot 100$$

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.

NAME DATE PERIOD

Unit 3, Lesson 16: Finding the Percentage

1. A sign in front of a roller coaster says "You must be 40 inches tall to ride." What percentage of this height is:

   a. 34 inches?

   b. 54 inches?

2. At a hardware store, a tool set normally costs $80. During a sale this week, the tool set costs $12 less than usual. What percentage of the usual price is the savings? Explain or show your reasoning.

3. A bathtub can hold 80 gallons of water. The faucet flows at a rate of 4 gallons per minute. What percentage of the tub will be filled after 6 minutes?

4. The sale price of every item in a store is 85% of its usual price.

   a. The usual price of a backpack is $30, what is its sale price?

   b. The usual price of a sweatshirt is $18, what is its sale price?

NAME DATE PERIOD

c. The usual price of a soccer ball is $24.80, what is its sale price?

(from Unit 3, Lesson 15)

5. A shopper needs 48 hot dogs. The store sells identical hot dogs in 2 differently sized packages. They sell a six-pack of hot dogs for $2.10, and an eight-pack of hot dogs for $3.12. Should the shopper buy 8 six-packs, or 6 eight-packs? Explain your reasoning.

(from Unit 3, Lesson 9)

6. Elena is 56 inches tall.

   a. What is her height in centimeters? (Note: 100 inches = 254 centimeters)

   b. What is her height in meters?

(from Unit 3, Lesson 4)