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Unit 3, Lesson 14: Solving Percentage Problems

Let's solve more percentage problems.

14.1: Number Talk: Multiplication with Decimals

Find the products mentally.

$6 \cdot (0.8) \cdot 2$

$(4.5) \cdot (0.6) \cdot 4$

14.2: Coupons

Han and Clare go shopping, and they each have a coupon. Answer each question and show your reasoning.

1. Han buys an item with a normal price of $15, and uses a 10% off coupon. How much does he save by using the coupon?

2. Clare buys an item with a normal price of $24, but saves $6 by using a coupon. For what percentage off is this coupon?

Are you ready for more?

Clare paid full price for an item. Han bought the same item for 80% of the full price. Clare said, "I can't believe I paid 125% of what you paid, Han!" Is what she said true? Explain.

14.3: Info Gap: Music Devices

Your teacher will give you either a problem card or a data card. Do not show or read your card to your partner.

If your teacher gives you the *problem card*:

1. Read your card silently and think about what you need to know to be able to answer the questions.

2. Ask your partner for the specific information that you need.

3. Explain how you are using the information to solve the problem.

4. Solve the problem and show your reasoning to your partner.

If your teacher gives you the *data card*:

1. Read your card silently.

2. Ask your partner *"What specific information do you need?"* and wait for them to *ask* for information.

   If your partner asks you for information that is not on the card, do not do the calculations for them. Tell them you don't have that information.

3. Have them explain *"Why do you need that information?"* before telling them the information.

4. After your partner solves the problem, ask them to explain their reasoning, even if you understand what they have done.

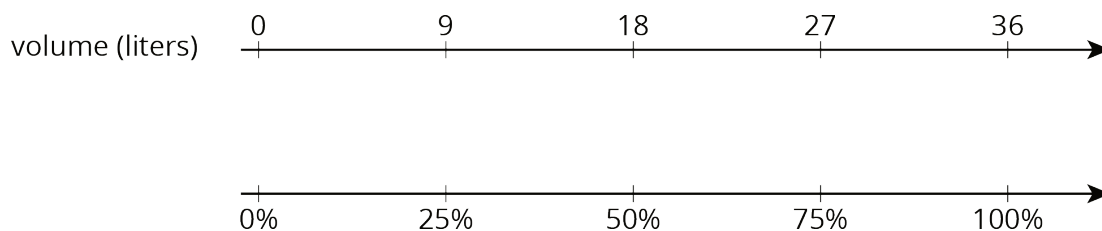Both partners should record a solution to the problem.

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Lesson 14 Summary

A pot can hold 36 liters of water. What percentage of the pot is filled when it contains 9 liters of water?

Here are two different ways to solve this problem:

- Using a double number line:

volume (liters)   0   9   18   27   36

                   0%   25%   50%   75%   100%

We can divide the distance between 0 and 36 into four equal intervals, so 9 is $\frac{1}{4}$ of 36, or 9 is 25% of 36.

- Using a table:

volume (liters)	percentage
36	100
9	25

$\cdot \frac{1}{4}$ $\cdot \frac{1}{4}$

Unit 3, Lesson 14: Solving Percentage Problems

1. For each problem, explain or show your reasoning.

    a. 160 is what percentage of 40?

    b. 40 is 160% of what number?

    c. What number is 40% of 160?

2. A store is having a 20%-off sale on all merchandise. If Mai buys one item and saves $13, what was the original price of her purchase? Explain or show your reasoning.

3. The original price of a scarf was $16. During a store-closing sale, a shopper saved $12 on the scarf. What percentage discount did she receive? Explain or show your reasoning.

4. Select **all** the expressions whose value is larger than 100.

    A. 120% of 100
    B. 50% of 150
    C. 150% of 50
    D. 20% of 800
    E. 200% of 30
    F. 500% of 400
    G. 1% of 1,000

5. An ant travels at a constant rate of 30 cm every 2 minutes.

    a. At what pace does the ant travel per centimeter?

    b. At what speed does the ant travel per minute?

    (from Unit 3, Lesson 8)

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6. Is $3\frac{1}{2}$ cups more or less than 1 liter? Explain or show your reasoning. (Note: 1 cup ≈ 236.6 milliliters)

(from Unit 3, Lesson 4)

7. Name a unit of measurement that is about the same size as each object.

a. The distance of a doorknob from the floor is about 1 _____.

b. The thickness of a fingernail is about 1 _____.

c. The volume of a drop of honey is about 1 _____.

d. The weight or mass of a pineapple is about 1 _____.

e. The thickness of a picture book is about 1 _____.

f. The weight or mass of a buffalo is about 1 _____.

g. The volume of a flower vase is about 1 _____.

h. The weight or mass of 20 staples is about 1 _____.

i. The volume of a melon is about 1 _____.

j. The length of a piece of printer paper is about 1 _____.

(from Unit 3, Lesson 2)