Unit 6, Lesson 6

Percentages and Equations

Let's use equations to find percentages.

6.1 Math Talk: 60% and 6% of Something

Decide mentally if each statement is true or false.

- 60% of 200 is 12.
- 60% of 20 has the same value as $\frac{60}{100} \cdot 20$.
- 6% of 200 has the same value as $(0.06) \cdot 200$.
- If 6% of x is 120, then x is 20.

6.2 Writing Equations to Represent Percentage Problems

Write an equation to represent the relationship in each statement. Then solve the equation to answer the question. Show your reasoning.

1. 40% of a number n is 58. What is that number?

2. 60% of c is 43.2. What is the value of c?

3. 38% of e is 190. What is the value of e?

6.3 Info Gap: Staying Active

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. Silently read your card and think about what information you need to answer the question.
2. Ask your partner for the specific information that you need. "Can you tell me _____?"
3. Explain to your partner how you are using the information to solve the problem. "I need to know _____ because . . . ." Continue to ask questions until you have enough information to solve the problem.
4. Once you have enough information, share the problem card with your partner, and solve the problem independently.
5. Read the data card, and discuss your reasoning.

If your teacher gives you the data card:

1. Silently read your card. Wait for your partner to ask for information.
2. Before telling your partner any information, ask, "Why do you need to know _____?"
3. Listen to your partner's reasoning and ask clarifying questions. Only give information that is on your card. Do not figure out anything for your partner!
   These steps may be repeated.
4. Once your partner says they have enough information to solve the problem, read the problem card, and solve the problem independently.
5. Share the data card, and discuss your reasoning.

Lesson 6 Summary

We can write equations to help us solve percentage problems.

Example: There are 455 students in school today, which is 70% school attendance. How many students go to the school?

The number of students in school today is known in two different ways: as 70% of the students in the school, and also as 455. If s represents the total number of students who go to the school, then 70% of s, or $\frac{70}{100}s$, represents the number of students that are in school today, which is 455.

We can write and solve the equation:

$$\frac{70}{100}s = 455$$
$$s = 455 \div \frac{70}{100}$$
$$s = 455 \cdot \frac{100}{70}$$

There are 650 students in the school.

$$s = 650$$

The equation can also be written using the decimal equivalent of $\frac{70}{100}$, which is 0.7:

$$0.7s = 455$$
$$s = 455 \div 0.7$$
$$s = 650$$

We can check this answer by substituting 650 for x in the equation and seeing if the equation is true.

$$0.7x = 455$$
$$0.7(650) = 455$$
$$455 = 455$$