

Grade 4 Mathematics

Algebra: Lesson 3

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol () by them.

Purpose of Lesson 3:

- In this lesson, the tutor and the students will
 - ✓ find the value of a variable,
 - ✓ use numbers to replace unknowns, and
 - ✓ choose a number sentence to represent real-world problems.

Equipment/Materials Needed:

- Copies of Student Sheet 104
- Paper and pencils
- Chalkboard

Preparations before beginning Lesson 3:

- Run one copy of Student Sheet 104 for each student.
- Have paper and pencils available.

Lesson 3: Algebra

Say:

In this lesson, you will look at number sentences that may have numbers missing in them. You will need to find a number that can be used to make the sentence true.

 Write these sentences on the board.

A.

$$\times = 49$$

B.

$$+ ? = 10$$

C.

$$? \times ? = 18$$

D.

$$\times ? \times ? = ?$$

Say:

If the same shape means the same number: What number could we use in the squares (•) to make sentence A true? (7) If we say now that the square is equal to seven, what does the triangle (?) equal in sentence B? (3) Use • = 7 and ? = 3. What does the circle (○) equal in sentence C? (6) What does • ´ ? ´ ? equal? (126)

Say:

Instead of using geometric figures, we could use letters, such as A, B, C or a, b, c. Letters or symbols that are used in number sentences to show unknown amounts are called *variables*. In the sentences above, the •, the ? and the ? are all variables. If the letters or variables are the same, they must represent the same number. In one of the sentences above, we had two squares. The squares represented the same number.

 Write these number sentences on the board.

$$A + A + A = 9$$

$$A + B = 3$$

$$B + C = 8$$

$$A + B + C = ?$$

Say:

What do A, B, and C equal? (A = 3, B = 0, C = 8) Have the students explain how they find each number. So what does A + B + C equal? (11)

Write these two number sentences on the board.

$$m + n = 10 \quad 3 = n$$

Say:

What is the value of m ? (7) How do you know? (If I use $n = 3$ in the problem, $m + 3 = 10$. I know $7 + 3 = 10$; m must equal 7.)

Give students Student Sheet 104.

Say:

On the first part of this sheet, you need to find the value for the variable that will make the sentence true. Use your number sense to find the answers. Note: The first few problems focus on the properties of numbers. **The second part of the sheet asks students to pick a number sentence that represents the real-world problem.**

Answers:

- | | | | | | |
|-------|------|------|-------|-------|-------|
| 1. 0 | 2. 2 | 3. 6 | 4. 8 | 5. 1 | 6. 8 |
| 7. 10 | 8. 0 | 9. C | 10. B | 11. A | 12. D |

Have one student summarize today's lesson. Finding the value of an unknown number can be easy if one just thinks about how the numbers are related.

Student Sheet 104 (Algebra: Lesson 3)

On problems 1 – 8, find the value of the variable or unknown that makes the sentence true.

1. $5 + a = 5$

2. $3 + 2 = b + 3$

3. $c + 0 = 6$

4. $4 \times 8 = d \times 4$

5. $7 \times e = 7$

6. $f \times f = 64$

7. $g \div 10 = 1$

8. $h \times 80 = 0$

On problems 9 – 12, choose the number sentence that could be used to answer the questions.

9. There are five oranges in some baskets. There are 20 oranges in all. Which number sentence could be used to find out how many baskets were used?

A. $5 + b = 20$

B. $5 - b = 20$

C. $5 \times b = 20$

D. $5 \div b = 20$

10. Trey had \$42 but spent \$23. Which number sentence could be used to find out how much money Trey has left?

A. $42 + 23 = m$

B. $42 - 23 = m$

C. $42 \times 23 = m$

D. $42 \div 23 = m$

11. Julie knows that 1 week = 7 days. She has to find out how many weeks are in 63 days. Which number sentence could she use to find the answer?

A. $7w = 63$

B. $63w = 7$

C. $7 + w = 63$

D. $63 - w = 7$

12. Todd wanted to find out the weight of his cat, but the cat won't stand on the scale. Todd got on the scale and read that he weighed 82 lbs. He got back on the scale with his cat in his arms, and the scale read 96 lbs. Which number sentence could be used to find the weight of his cat?

A. $82 + 96 = w$

B. $96 \div 82 = w$

C. $96 \times 82 = w$

D. $96 - 82 = w$