Math 6 - Act. 06: Two-Step Equations

Summary

Students will work through Two-Step Equations using algebra tiles, drawing pictures, and writing the step-by-step process.

Main Core Tie Mathematics Grade 6 Strand: EXPRESSIONS AND EQUATIONS (6.EE) Standard 6.EE.2

Materials

Algebra tiles for each student Foam working mat for desk top Colored pencils One-step and two-step equations worksheets Additional Resources *The Algebra Lab: Middle School*, 1990 Creative Publications, 1300 Villa Street, Mountain View, CA 94041

Middle Grades Math, Course 1, Prentice Hall, 2001

Background for Teachers

Solving two-step equations algebraically has many real world applications. Keeping an equation in balance is a common thread throughout all algebra. Students must learn to automatically perform the same operation with the same number on both sides of the equation.

Linear equations with one variable have only one solution. To find the solution, first simplify by using the properties and the order of operations to rewrite without grouping symbols and to collect like terms. Then isolate the variable by using inverse operations. Addition and subtraction are inverse operations; multiplication and division are inverse operations.

When you solve a two-step equation, whether modeling with tiles or using algebraic properties, you get the variable alone on one side of the equation by reversing the order of operations.

Intended Learning Outcomes

6. Represent mathematical situations.

Instructional Procedures

Invitation to Learn

Choose one task from the following list and write the step-by-step instructions on how to accomplish the task:

making cookies

mowing the lawn

building a snowman

building a fence

Call on students to share their step-by-step instructions. Discuss the importance of completing one step before moving on to the next.

Many math problems need to be handled in a step-by-step method as well.

Instructional Procedures

Distribute algebra tiles, mats, and colored pencils accompanying worksheets.

Review writing and solving one-step equations using algebra tiles. (Note: one-step equations

should have been mastered in the 5th grade. However, since the equation concept is relatively new and requires such abstract thinking, the teacher may want to conduct a very thorough review of one-step equations. Two or three class periods might even be used for review to ensure confidence in these equations.)

Demonstrate the following on overhead:

Addition equation x + 2 = 6

Subtraction equation x - 3 = 7

Multiplication equation 3x = 6

Have students work through the worksheet using their algebra tiles, drawing pictures, and writing the solution to each problem.

Two-Step Equations:

Step 1: Add or subtract the same number from each side of equation

Step 2: Divide the same number (the number beside the variable) from both sides of equation. Demonstrate the following on the overhead with students using tiles. Discuss each step thoroughly

2x + 3 = 5	2 + 5x = 12
3y - 2 = 7	3y - 5 = 10

Have students work through problems on the worksheet using algebra tiles, drawing pictures, and writing the step-by-step process as well as the solution to each equation.

Curriculum Integration

Present some real world problems that require a two-step equation to solve the problem. *Economics example*—Carmela wants to buy a digital camera for \$249. She has \$24 and is saving \$15 each week. Solve the equation \$15w + \$24 = \$249 to find how many weeks she will take to save enough to buy the camera. (answer: 15 weeks)

Nutrition example—A soccer player wants to eat 800 calories at a meal that includes a roast beef sandwich and potato chips. The sandwich has 570 calories and the potato chips have 23 calories each. Solve the equation 570 + 23p = 800 to find the number of potato chips the soccer player can eat. (answer: 10 chips)

Extensions

Homework & Family Connection

A family vacation to Disneyland will cost \$2,000. Your family has already saved \$450 toward the trip and they are saving \$300 every month. How many months will you have to save before you can go on your family vacation? Write an equation to solve the problem. Since the solution is not a whole number, discuss with your family about how to round the answer. Should you round up or down?

Assessment Plan

Give students 2 or 3 two-step equations and ask them to draw algebra tiles to represent the equations, showing the steps involved. Then find the solution to the equations.

Authors

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