

One-Step Equations

Reporting Category Patterns, Functions, and Algebra

Topic Solving one-step linear equations

Primary SOL 6.13 The student will solve one-step linear equations in one variable, including practical problems that require the solution of a one-step linear equation in one variable.

Materials

- Solving Equations activity sheet (attached)
- Sample Equation Word Problems activity sheet (attached)
- Calculators

Vocabulary

expression, equation, inverse operations, one-step equation, order of operations, properties, variable (earlier grades)

algebraic expression, algebraic equation, numerical expression, variable expression, verbal expression, verbal sentence (6.13)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Present students with the following scenario as a think-pair-share activity: Joe and his friend Bob have 17 games altogether. If Joe has six games, how many does Bob have? Have students represent the scenario with an equation and solve it.
2. Discuss as a class the scenario and students' equations, incorporating vocabulary and properties when possible. Have students solve the problem algebraically and confirm the solution using the substitution property.
3. Have students work through the Solving Equations activity sheet. Solve problems algebraically, create a verbal equation, and confirm the solution.
4. Have students complete the Sample Equation Word Problems activity sheet independently or with a partner.

Assessment

- **Questions**
 - When solving an equation, why is it important to perform identical operations on both sides of the equal sign?
 - What would happen if balance was not maintained in an equation?
- **Journal/Writing Prompts**
 - Write a word problem whose solution can be found by solving the equation $x - 8 = 10$. Solve the problem.
 - Jack had \$25. He went to the grocery store and bought a few things. When he paid, he got \$8 change. He is trying to figure out how much money he spent. Jack thinks he should solve the equation $n - \$25 = \8 to see how much he

spent. His friend, Jill, thinks he should solve the equation $\$25 - n = \8 to see how much he spent. Identify who you think is correct, and explain why.

- Create a word problem that can be represented by a one-step equation. Show the equation, then solve it.

- **Other**

- Have students proofread equations to find and correct mistakes.
- Have students create equation matching cards. One card has the equation, a second card has the solution, and a third card has a word problem that can be represented by the equation. Distribute cards and have students form groups by finding their matches.

Extensions and Connections (for all students)

- Have students apply what they know regarding solving a single-step equation to solving a two-step equation.

Strategies for Differentiation

- Use graphic organizers to show the steps involved in solving an equation.
- Use different types of manipulatives and online resources to assist students with solving equations.
- Have students model/draw each step of solving an equation on a separate balance mat.
- Write down the steps used to solve an equation. Begin with a simple example that has been solved for the student. Advance to more complex equations.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

Solving Equations

Equation	Solve Algebraically	Write a verbal equation that would match the equation	Confirm Solution
$x + 3 = -4$			
$\frac{1}{2}x = 4$			
$-12 = 3x$			
$x - 3 = -3$			
$2x = -10$			

Sample Equation Word Problems

Name _____ Date _____

1. The sum of 5 and x is 20. What is x ?
2. The product of x and three is negative-27. What is x ?
3. Jim's three fish tanks contain an equal amount of fish. If Jim has a total of 27 fish, how many fish are in each tank?
4. Steven went to the store and bought five sweatshirts. He spent \$45. What was the price of each shirt?
5. How many boxes of envelopes can you buy with \$12, if one box costs \$3?
6. At a restaurant, Bill and his four friends decided to divide the bill evenly. If each person paid \$12, what was the total bill?
7. Last Saturday, Allyson had \$38. For her birthday she received more money. She now has \$90. How much money did she receive?