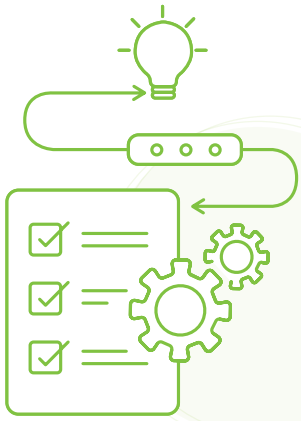
Riverside Insights CogAT®

Algebra - Linear Equations

Grades 6-8 Math

Learning Objectives

- Students will be able to understand and solve linear equations.
- Students will be able to use ***verbal reasoning skills*** to use mathematical language to explain the steps involved in solving linear equations.
- Students will be able to use ***quantitative reasoning skills*** to solve linear equations.
- Students will be able to use ***nonverbal reasoning skills*** to use algebraic notation to represent and solve problems.



Materials Needed

- Whiteboard and markers
- Algebra tiles or other visual aids for solving equations
- Worksheets/practice problems for practicing linear equations

Procedure

Introduction

1. Engage students by asking them to share what they know about linear equations.
2. Review the basic concept of an equation as a statement of equality between two expressions.
3. Ask students to think of a real-world scenario that can be represented by a linear equation. Write down their examples on the whiteboard.
4. Introduce the concept of a linear equation as an equation that describes a line on a graph.

Teaching

5. Start by introducing linear equations and what they represent. Use algebra tiles or blocks to demonstrate how to create and solve simple linear equations (e.g., **2x + 3 = 9**).
6. Model how to solve a linear equation using inverse operations, starting with simple equations and progressing to more complex ones.
7. Provide examples of linear equations on the whiteboard and guide students through the steps of solving them using inverse operations.
8. Have students practice solving linear equations on the whiteboard with you.

Guided Practice

9. Provide students with worksheets or display problems that have linear equations to solve.
10. Review the steps for solving linear equations on the whiteboard before students begin working.
11. Circulate around the room to provide support and feedback as students work on the worksheets.

Independent Practice

12. Have students work in pairs or small groups to create linear equations that represent their real-world scenarios from the introduction.
13. Provide students with practice solving linear equations. Circulate around the room to check for understanding and provide assistance where necessary.
13. Use this opportunity to differentiate instruction based on how students learn best:

    a. ***Nonverbal:*** Have students use algebra tiles or blocks to create and solve linear equations, and then have them represent their solutions in a visual format (e.g. a graph).

    b. ***Quantitative:*** Provide students with word problems that involve linear equations. For example: "If John has 5 apples and he gives 2 apples to Jane, how many apples does John have left?" (represented as **5 - 2x = y**, where ***x*** represents the number of apples John gives to Jane and y represents the number of apples John has left).

    c. ***Verbal:*** Students work with partners or small groups to create their own linear equations, then share the equations with other pairs/groups to solve. Students should solve each other's equations and then share how they arrived at their answers.

Closure

14. Summarize the key concepts of the lesson and provide students with an opportunity to ask any questions they may have.
15. Give students one final at-bat to shore up mastery of the learning objectives:

    a. ***Verbal:*** Have students explain the steps involved in solving a linear equation using mathematical language.
    b. ***Quantitative:*** Have students create their own word problems involving linear equations and solve them.
    c. ***Nonverbal:*** Have students create a visual representation of a linear equation and its solution using algebra tiles or blocks.

Assessment

Observation of student participation and understanding during guided and independent practice

a. ***Quantitative:*** Review students' practice problems to assess student understanding

b. ***Nonverbal:*** Use students' visual representations of linear equations and the solutions

c. ***Verbal:*** Have students share (with the class, partner, or teacher) their thinking of how to solve a problem.

Extension Activities

- Have students create a poster or infographic that explains the steps involved in solving a linear equation.
- Provide students with more advanced worksheets/problems that involve solving linear equations with multiple variables.
- Have students work in pairs to create a word problem involving linear equations and exchange problems with another pair to solve.