Lesson Plan: Solving Two-Step Equations

Objective:

Students will solve two-step equations involving addition, subtraction, multiplication, and division and understand the process to isolate the variable.

Materials:

- Whiteboard and markers
- Student notebooks and pencils
- Handouts with practice problems
- Optional: Graphing calculator or algebra tiles

Lesson Duration:

40 minutes

Introduction (5 minutes)

1. **Hook/Engagement**:
   - Start with a quick mental math exercise related to solving simple equations. For example:
     - "If

$$x + 5 = 12$$

, what is

$$x$$

?"
2. **Objective and Agenda**:
   - Explain that today's focus is on solving two-step equations.
   - Outline the steps and what students will learn:
     - a. Reviewing the process of solving two-step equations.
     - b. Practicing with different types of equations.

Direct Instruction (10 minutes)

1. **Review Two-Step Equations**:
   - Write an example equation on the board:

$$3x - 7 = 11$$

.

- Explain the steps to solve it:
    a. **Isolate the term with the variable**:
        - Add 7 to both sides:

$$3x - 7 + 7 = 11 + 7$$

        - Simplify:

$$3x = 18$$

    b. **Solve for the variable**:
        - Divide both sides by 3:

$$\frac{3x}{3} = \frac{18}{3}$$

        - Simplify:

$$x = 6$$

- Reinforce that the goal is to isolate the variable on one side of the equation.
2. **Different Types of Two-Step Equations**:
    - Show examples with different operations:
        - Addition and Division:

$$\frac{x + 5}{4} = 7$$

        - Subtraction and Multiplication:

$$2(x - 3) = 8$$

Guided Practice (10 minutes)

1. **Solve Together**:
    - Provide a couple of problems for students to solve with guidance:

        -
$$4x + 9 = 21$$

        -
$$\frac{2x - 3}{5} = 1$$

    - Solve each problem step-by-step as a class, asking for student input at each step.
2. **Check Understanding**:
    - Ask students to share their solutions and explain their reasoning.

Independent Practice (10 minutes)

1. **Practice Problems**:

- Distribute a handout with practice problems for students to solve independently:

  - $$2x + 7 = 15$$

  - $$\frac{x - 4}{3} = 2$$

  - $$5(x - 2) = 20$$

  - $$\frac{3x + 6}{2} = 9$$

2. **Circulate and Assist**:
   - Walk around the classroom to monitor progress and provide assistance as needed.

Closure (5 minutes)

1. **Review and Recap**:
   - Quickly review the steps to solve two-step equations:
     - a. Eliminate constants from the term with the variable.
     - b. Isolate the variable by performing the inverse operation.
2. **Exit Ticket**:
   - Ask each student to solve a quick two-step equation on a sticky note or index card as an exit ticket:
     - Example:

     $$3(x - 2) = 12$$

   - Collect these to assess understanding.

Additional Tips:

- **Differentiation**: If some students finish early or need extra help, provide additional practice problems or algebra tiles for visual learners.
- **Interactive Examples**: Use graphing calculators or algebra software if available to show the graphical representation of solutions.
- **Enrichment**: Challenge advanced students with equations involving fractions or variables on both sides.

This lesson plan ensures a thorough understanding of two-step equations by combining direct instruction with ample practice and assessment.