Core Skills Analysis

Mathematics

- Ebony learned to balance equations by understanding the principle that whatever is done to one side must be done to the other to maintain equality.
- She practiced solving linear equations that have variables on both sides, enhancing her ability to isolate unknowns systematically.
- Ebony developed skills in applying inverse operations, such as addition or subtraction, to simplify equations before solving for the variable.
- She improved her algebraic reasoning and logical thinking by recognizing equivalent expressions and maintaining equation integrity throughout the steps.

Tips

To deepen Ebony's understanding of solving linear equations, encourage her to explore real-world problems that can be modeled with simple equations, such as budgeting or calculating distances. She might also benefit from interactive algebra games or apps that reinforce equation balancing through engaging challenges. Another effective extension is collaborative problem-solving activities where Ebony explains her reasoning out loud or teaches a peer, fostering both mastery and communication skills. Finally, incorporating visual aids like balance scales or algebra tiles can help her concretely grasp the balance concept in equations.

Book Recommendations

- <u>Algebra Survival Guide</u> by Josh Rappaport: A straightforward, student-friendly book that breaks down algebra concepts with clear explanations and practical examples.
- Math Doesn't Suck: How to Survive Middle School Math Without Losing Your Mind or Breaking a Nail by Danica McKellar: This book makes algebra accessible and fun, helping middle schoolers overcome anxieties with relatable explanations.
- <u>The Art of Problem Solving, Volume 1: The Basics</u> by Sandor Lehoczky & Richard Rusczyk: A comprehensive resource offering in-depth strategies for problem solving including extensive algebra topics suitable for ambitious learners.

Learning Standards

- Mathematics Key Stage 3 (Years 7-9): Solve linear equations in one variable, including those with the unknown on both sides (NC 3Algebra 1b)
- Apply inverse operations to solve equations systematically (NC 3Algebra 1b)
- Use algebraic methods to solve problems presented algebraically (NC 3Algebra 1a)

Try This Next

- Create a worksheet with mixed linear equations where Ebony must solve and check her answers by substituting back into the original equation.
- Design a quiz that includes word problems requiring formation of equations with variables on each side for Ebony to solve.
- Challenge Ebony to draw a balance scale diagram for several equations to visually represent solving steps.

Growth Beyond Academics

This activity likely helped Ebony develop patience and persistence as solving equations with variables on both sides can be complex. The online format may have encouraged independence and self-paced learning, while reinforcing her confidence as she successfully navigated through multi-step problems.