

Algebra Match

Purpose

Students will write and solve two-step linear equations and inequalities in one variable and check the answers.

Materials

For the teacher: chalk, chalkboard

For each student: paper, pencil, 1 strip from the Black Line Master (BLM) *Algebra Steps*

Activity

A. Pre-Activity Preparation

1. Make a copy of the BLM *Algebra Steps*. Cut the steps into strips so that each student can have one step to an algebraic equation.
2. Create more strips, if necessary, by writing out an algebraic equation and each step to its solution. Cut the steps into strips.

B. Introduction

1. Review the steps to solving a one-step algebra equation.
2. Write a two-step algebra equation on the chalkboard, such as " $2x + 5 = 29$."
3. Ask students how this equation is different from the first one. Ask students what they would choose as the first step in solving this equation and have them explain their answer.
4. Discuss performing a variety of operations to both sides of the equation, such as subtracting $2x$, dividing by 2, and subtracting 5 (adding -5). Ask students which operation they think will simplify finding the solution the most.
5. Ask students in what format the answer will be when they have found a solution.
6. Explain that since the solution will be in the format $x = \underline{\quad}$, it is important to keep the variable on one side of the equation and the constants (or numbers) on the other side of the equation. Tell students that the easiest way to accomplish this in the solution is to first add or subtract (or add the inverse of) the constant that is on the same side as the term that has the variable.

(continued)



EXTENDING
THE

ACTIVITY

Have students write a two-step algebraic equation in their math journals. Instruct them to write each step of the solution and include a justification for it.



INCORPORATING

TECHNOLOGY

Have students visit the Virtual Library portion of the Internet site matti.usu.edu. A variety of algebra activities are offered by clicking the Algebra 6-8 grid. Have students visit the Algebra Tiles activity before moving onto other activities.

Standards Links
7.2.1, 7.3.1,
7.7.1, 7.7.3

Activity (continued)

7. Demonstrate this step and have students assist with the complete solution. Check student answers by substitution. Explain to students that any of the other operations (as mentioned in step 4) is still correct but will make the solution more complicated. Demonstrate finding the solution by beginning with one of the other operations listed in step 4.
8. Demonstrate how to find the solution to a two-step algebraic inequality. Show students how to switch the direction of the inequality sign when they multiply or divide by a negative number. Check student answers by substitution.
9. Have students practice finding solutions to four or five two-step algebraic equations and inequalities. Discuss answers as a class after the completion of each solution. Check student answers by substitution.







C. Class Activity

1. Pass out an *Algebra Steps* strip from the BLM to each student. If it is necessary to give a student more than one strip, have the second strip be a step to solving the same equation as the first strip.
2. Have students walk around the classroom until they have found the classmates who have the matching steps to the solution for their equation.
3. Instruct groups to present their equation and solution in front of the class. Have them justify each step of the solution. Have students check their final answer by substitution.

Classroom Assessment

Basic Concepts and Processes

During the introduction and group presentations, ask the following questions about specific equations or inequalities:

-  What is the first step you would take in finding a solution to this equation?
-  Why would you choose that step as the first step?
-  How could you find the solution by taking a different step as the first step?
-  Show me how to find the solution to $-3x > 18$.
-  Why did you change “>” to “<”?
-  How do you check your answer to an algebraic equation?

Algebra Steps

$-2x + 5 = 11$	$2x + 7 = 11$	$-2x + 7 = 11$
+ -5 to both sides	+ -7 to both sides	+ -7 to both sides
÷ both sides by -2	÷ both sides by 2	÷ both sides by -2
$x = -3$	$x = 2$	$x = -2$
$2x - 7 = 11$	$7x - 2 = 12$	$5x + 2 = 22$
+ 7 to both sides	+ 2 to both sides	+ -2 to both sides
÷ both sides by 2	÷ both sides by 7	÷ both sides by 5
$x = 9$	$x = 2$	$x = 4$
$-2x - 5 = 11$	$-7x + 2 = 16$	$-2x - 7 = 11$
+ 5 to both sides	+ -2 to both sides	+ 7 to both sides
÷ both sides by -2	÷ both sides by -7	÷ both sides by -2
$x = -8$	$x = -2$	$x = -9$

Algebra Steps

Teacher Directions

After making photocopies of the BLM *Algebra Steps*, cut each step for the algebraic equations into strips. After the introduction of the activity, give each student a strip. Allow students to walk around the room to find classmates with the other matching steps to the solution to their equation. Have groups present their equations and solutions in front of the classroom. Instruct each group to check their final answer by substitution.

Answer Key

The steps to each equation are listed in order under that equation on the BLM. Lines separate the equations.