Name: _____   Date: _____

Student Exploration: Solving Equations on the Number Line

Vocabulary: equation, expression, solution

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)
Brenda and Andrea want to share a submarine sandwich for lunch. Andrea has $2.70 and Brenda will pay for the rest.

1. If x is the amount Brenda pays, write an **expression** that describes the amount Brenda and

    Andrea pay for the submarine sandwich. _____

2. The sub costs $4.10. Use the expression you wrote above and the cost of the submarine

    sandwich to write an **equation** to model this situation. _____

Gizmo Overview
In the *Solving Equations on the Number Line* Gizmo, you will be given equations like
$x + 2.7 = 4.1$ and use number lines to find their **solutions**, the values that make them true.

Here's how the Gizmo works:

The equation for
you to solve is here.

Use the number line to solve
the following problem:

$x + 2.7 = 4.1$

$x = ?$

New

Show me

Each value in the
equation will be
represented by an
arrow above the
number line.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

You will use these
sliders to model
the values on the
left side of the
equation.

☑ Graph left side of equation
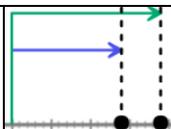
$0 + 0 = 0$

0.0

0.0

☑ Graph right side of equation

$0 = 0$

0.0

You will use this slider to model the
value on the right side of the equation.

Once you model each side of the equation, you will drag the slider that models the missing
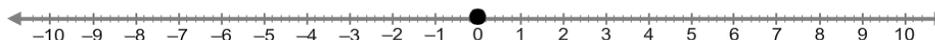value until the two sides of the equation are equal.

Activity:	Get the Gizmo ready:	
Solutions on a number line	• You should see the equation $x + 2.7 = 4.1$. If not, click **Refresh** in your browser.	

1. In this question, you will solve the equation $x + 2.7 = 4.1$.

    A. Use the blue slider on the bottom left to model 2.7, the number on the left side of the equation. (To quickly set the value of a slider, type the number into the text box to the right of the slider and press **Enter**.) Use the green slider on the bottom right to model 4.1, the number on the right side of the equation.

    B. To solve $x + 2.7 = 4.1$, you need to find the value of x that makes $x + 2.7$ equal to 4.1. Drag the red slider on the top left back and forth until the vertical dashed lines line up. (The lines turn yellow when they are lined up.) Sketch the result on the number line below.

    C. What is the solution of $x + 2.7 = 4.1$? _____ Click **Show me** to check.

    D. Substitute the solution into $x + 2.7 = 4.1$. In the space to the right, show that the solution makes the equation true.

2. Click **New**. You should see the equation $-4.6 + 1.9 = n - 1.2$.

    A. On the left, set the top (red) slider to –4.6 and the bottom (blue) slider to 1.9. On the right, set the bottom (purple) slider to –1.2. Drag the green slider on the left until the vertical dashed lines line up. Sketch the result on the number line below.

    B. What is the solution of $-4.6 + 1.9 = n - 1.2$? _____ Click **Show me** to check.

    C. Substitute the solution into $-4.6 + 1.9 = n - 1.2$. In the space to the right, show that the solution makes the equation true.
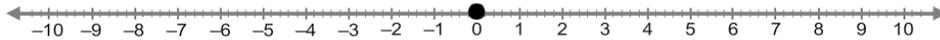
(Activity continued on next page)
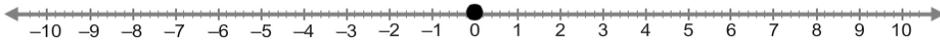
Activity (continued from previous page)

3. Click **New**. Work through more problems in the Gizmo. After you have completed at least five problems, choose two equations from the Gizmo to solve.

   Fill in each blank with the equation you are solving. Solve each equation on the number line in the Gizmo and sketch the result on the number line provided. Then write the solution and click **Show me** to check your answer.

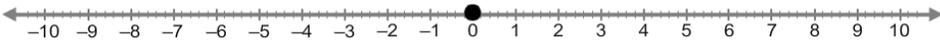   A. Equation: _____   Solution: _____

   B. Equation: _____   Solution: _____

4. Click **New** until the Gizmo has a problem that uses all four sliders (red and blue on the left, and green and purple on the right). Ignoring the problem given in the Gizmo, use the sliders to model and solve each equation below. Sketch the results on each number line.

   A. $-1.8 + n = 2.6 - 3.9$ Solution: _____

   B. $-2.1 - 1.5 = x + 1.3$ Solution: _____