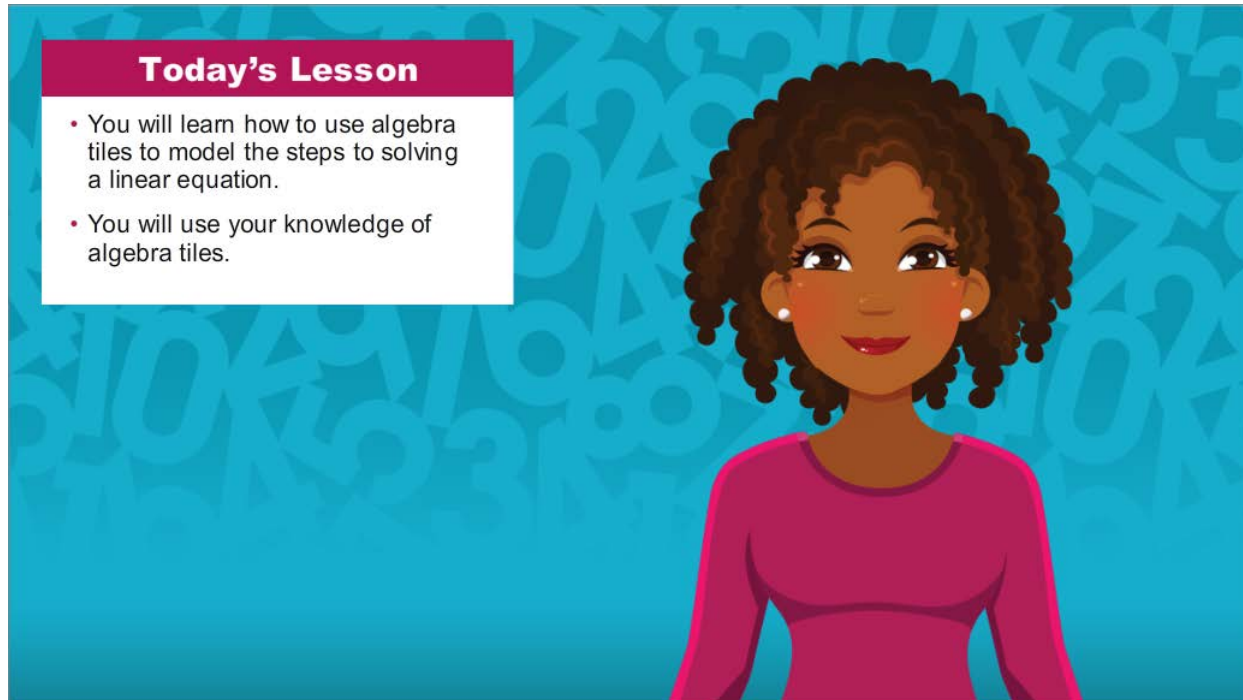


## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

#### Introduction



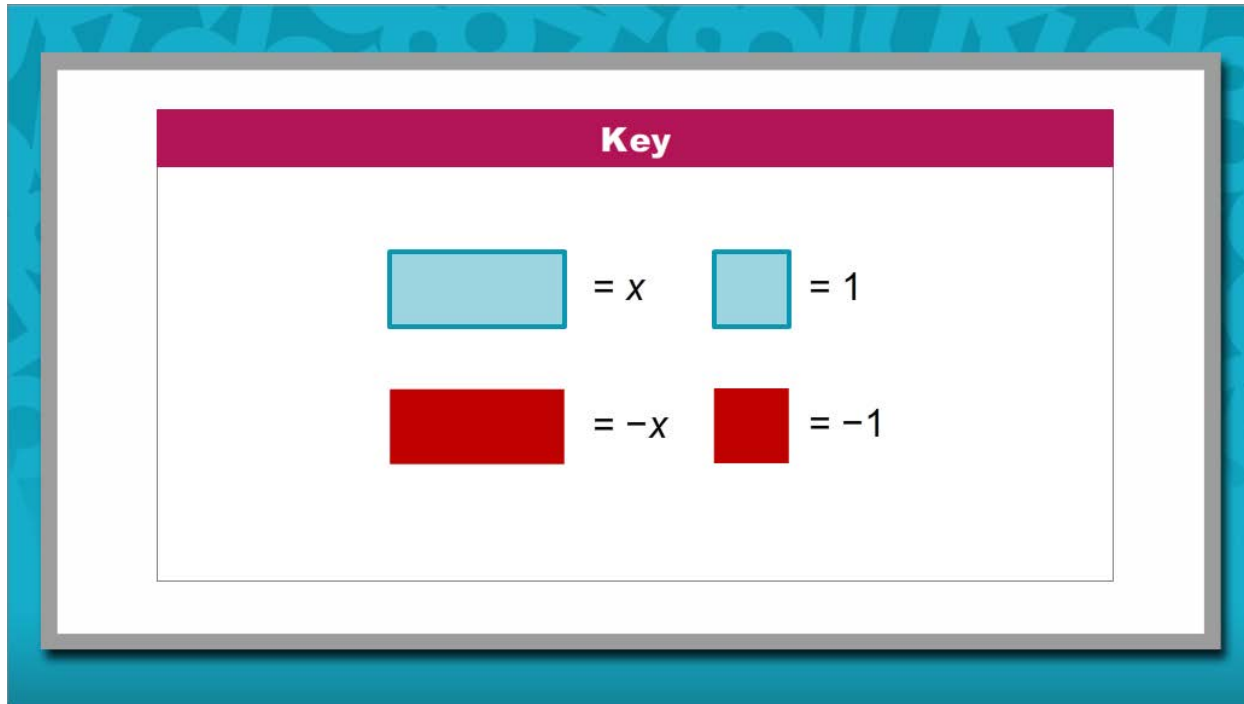
**Today's Lesson**

- You will learn how to use algebra tiles to model the steps to solving a linear equation.
- You will use your knowledge of algebra tiles.

Hi there! I'm so glad you could join me for this lesson in Algebra I, where you will learn how to use algebra tiles to model the steps to solving an equation.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

**Anticipatory Set**



Take a moment to review what the following algebra tiles represent.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

**Solving Equations Using Algebra Tiles**

**SOLVING EQUATIONS  
USING ALGEBRA TILES**

**Click the Examples Below to Learn More**

Example

Self-Check

Click the examples below to learn more.





- Example
- Self-Check

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example: Steps

**Key**

-  =  $x$
-  =  $-x$
-  =  $1$
-  =  $-1$

[View Tiles](#)

**Step 1:**  $4(x - 1) = 3x + 1$

**Step 2:**  $4x - 4 = 3x + 1$

**Step 3:**  $4x - 4 + (-3x) = 3x + 1 + (-3x)$

**Step 4:**  $x - 4 = 1$

**Step 5:**  $x - 4 + 4 = 1 + 4$

**Step 6:**  $x = 5$

Use algebra tiles (on the following pages) to model the steps to solving the equation below. Review these steps at any time during the example.

**Step 1:**  $4(x - 1) = 3x + 1$

**Step 2:**  $4x - 4 = 3x + 1$

**Step 3:**  $4x - 4 + (-3x) = 3x + 1 + (-3x)$

**Step 4:**  $x - 4 = 1$

**Step 5:**  $x - 4 + 4 = 1 + 4$

**Step 6:**  $x = 5$

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

#### Example

**Key**

- $\text{Large Blue Rectangle} = x$
- $\text{Large Red Rectangle} = -x$
- $\text{Small Blue Square} = 1$
- $\text{Small Red Square} = -1$

**View Steps**

**Step 1**  
 $4(x - 1) = 3x + 1$

Drag and drop tiles here to represent one group of  $(x - 1)$

Equation Mat

Drag the appropriate tiles from the key and drop them on the equation mat.

To set up the equation on the equation mat, begin by interpreting Step 1. Notice that the left side of the equation includes parentheses. You can interpret,  $4(x - 1)$ , to mean 4 groups of  $(x - 1)$ .

Model this by placing 4 groups of  $(x - 1)$  on the left side of the equation mat.

Drag the appropriate tiles from the key and drop them on the equation mat. The steps to solving the equation are on page 4 for your review.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

**Key**

- $x$  (represented by a light blue rectangle)
- $-x$  (represented by a red rectangle)
- $1$  (represented by a light blue square)
- $-1$  (represented by a red square)

**View Steps**

**Step 1**  
 $4(x - 1) = 3x + 1$

Equation Mat

You have modeled one group of  $(x - 1)$ . Model three more groups of  $(x - 1)$ .

You have modeled one group of  $(x - 1)$ . Model three more groups of  $(x - 1)$ .

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

**Key**

- $\square$  (light blue) =  $x$
- $\square$  (red) =  $-x$
- $\square$  (light blue) =  $1$
- $\square$  (red) =  $-1$

**Step 1**  
 $4(x - 1) = 3x + 1$

Equation Mat

**You have modeled 4 groups of  $(x - 1)$ .**

**View Steps** **Next**

You have modeled 4 groups of  $(x - 1)$ .

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

**Key**

- $x$
- $-x$
- $1$
- $-1$

**View Steps**

**Step 1**

$$4(x - 1) = 3x + 1$$

Equation Mat

Drag and drop tiles here to represent the right side of the equation

Drag the appropriate tiles from the key and drop them on the equation mat.

Next, move the appropriate algebra tiles to the equation mat to represent the right side of the equation:  $3x + 1$ .

Drag the appropriate tiles from the key and drop them on the equation mat. The steps to solving the equation are on page 4 for your review.



**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

**Key**

- $\square$  (large blue) =  $x$
- $\square$  (large red) =  $-x$
- $\square$  (small blue) =  $1$
- $\square$  (small red) =  $-1$

**Step 1**

$$4(x - 1) = 3x + 1$$

Equation Mat

**You have modeled  $3x + 1$ .**

**Next**

You have modeled  $3x + 1$ .

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example (continued)

**Key**

- $\square$  (large blue) =  $x$
- $\square$  (large red) =  $-x$
- $\square$  (small blue) =  $1$
- $\square$  (small red) =  $-1$

**View Steps**

**Step 2**  
 $4x - 4 = 3x + 1$

**Equation Mat**

The Equation Mat shows a balance scale with algebra tiles. On the left side, there are four large blue tiles (representing  $4x$ ) and four small red tiles (representing  $-4$ ). On the right side, there are three large blue tiles (representing  $3x$ ) and one small blue tile (representing  $+1$ ).

Now take a moment to consider the algebra tiles on the equation mat. The left side represents 4 groups of  $(x - 1)$ . You could also consider this value as  $4x - 4$ . By doing so, you have essentially applied the Distributive Property to model the work in Step 2.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

**Key**

- $\square$  (large blue) =  $x$
- $\square$  (large red) =  $-x$
- $\square$  (small blue) =  $1$
- $\square$  (small red) =  $-1$

**View Steps**

**Step 3**

$$4x - 4 + (-3x) = 3x + 1 + (-3x)$$

Equation Mat

Using the tiles, model the left side of the equation on the equation mat.

As you know, when solving a linear equation algebraically, the goal is typically to end with the variable on the left side of the equation and a numerical value on the right. The goal is the same when using algebra tiles to solve an equation.

In Step 3,  $-3x$  is added to each side of the equation in order to begin isolating the variable. Drag and drop the appropriate algebra tiles to model this step.

Using the tiles, model the left side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example (continued)

**Key**

- $x$
- $-x$
- $1$
- $-1$

**View Steps**

**Step 3**

$$4x - 4 + (-3x) = 3x + 1 + (-3x)$$

Equation Mat

Using the tiles, model the right side of the equation on the equation mat.

Using the tiles, model the right side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

The screenshot shows an interactive algebra tile interface. On the left, a 'Key' box defines the tiles: a large light blue rectangle represents  $x$ , a large red rectangle represents  $-x$ , a small light blue square represents  $1$ , and a small red square represents  $-1$ . Below the key is a 'View Steps' button. The main area is titled 'Step 3' and displays the equation  $4x - 4 + (-3x) = 3x + 1 + (-3x)$ . Below the equation is an 'Equation Mat' with two columns. The left column contains four large light blue rectangles and four large red rectangles. The right column contains three large light blue rectangles, one small light blue square, and three large red rectangles. Below the mat is a 'Next' button. At the bottom of the interface, a message reads 'You have successfully modeled Step 3.'

You have successfully modeled Step 3.

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example (continued)

**Key**

- $x$
- $-x$
- $1$
- $-1$

**View Steps**

**Step 4**  
 $x - 4 = 1$

Equation Mat

Adding  $-3x$  to the left side of the equation mat creates 3 zero pairs. The result is  $x - 4$ .

Adding  $-3x$  to the right side of the equation mat also creates 3 zero pairs. The result is 1.

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example (continued)

**Key**

- $\square$  (light blue) =  $x$
- $\square$  (red) =  $-x$
- $\square$  (light blue) =  $1$
- $\square$  (red) =  $-1$

**View Steps**

**Step 5**

$$x - 4 + 4 = 1 + 4$$

Equation Mat

Using the tiles, model the left side of the equation on the equation mat.

In Step 5, 4 is added to each side of the equation in order to isolate the variable. Drag and drop the appropriate algebra tiles to model this step.

Using the tiles, model the left side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

Example (continued)

**Key**

- $x$  (large blue rectangle)
- $-x$  (large red rectangle)
- $1$  (small blue square)
- $-1$  (small red square)

**View Steps**

**Step 5**  
 $x - 4 + 4 = 1 + 4$

Equation Mat

Using the tiles, model the right side of the equation on the equation mat.

Using the tiles, model the right side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.



## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example (continued)

The screenshot shows an interactive algebra tile interface. On the left, a 'Key' box defines the tiles: a light blue horizontal rectangle represents  $x$ , a red horizontal rectangle represents  $-x$ , a light blue square represents  $1$ , and a red square represents  $-1$ . Below the key is a 'View Steps' button. The main area is titled 'Step 5' and shows the equation  $x - 4 + 4 = 1 + 4$ . Below the equation is an 'Equation Mat' with two columns. The left column contains one light blue  $x$  tile, followed by four pairs of a red  $-1$  tile and a light blue  $1$  tile. The right column contains one light blue  $1$  tile followed by four light blue  $1$  tiles. Below the mat is the text 'Equation Mat'. At the bottom center, a message reads 'You have successfully modeled Step 5.' To the right of this message is a 'Next' button.

You have successfully modeled Step 5.

## Module 5: Solving Linear Equations

### Topic 2 Content: Solving Equations Using Algebra Tiles

Example (continued)

The screenshot shows a digital interface for solving equations using algebra tiles. On the left, a 'Key' box defines the tiles: a light blue rectangle represents  $x$ , a red rectangle represents  $-x$ , a light blue square represents  $1$ , and a red square represents  $-1$ . Below the key is a 'View Steps' button. In the center, the 'Equation Mat' is displayed with the equation  $x = 5$  above it. The mat is divided into two columns. The left column contains one light blue rectangle ( $x$ ). The right column contains five light blue squares ( $5$ ). A 'Menu' button is located in the bottom right corner.

Adding 4 to the left side of the equation mat creates 4 zero pairs. The result is  $x$ .

Adding 4 to the right side of the equation mat results in 5.

You have arrived at the final step. The solution is  $x = 5$ .

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

**Self-Check**

**Self-Check**

The algebra tiles below represent the work between which two steps?

- Step 1 and Step 2
- Step 2 and Step 3
- Step 3 and Step 4
- Step 4 and Step 5

SUBMIT

Tiles and Steps

**Key**

=  $x$

=  $-x$

=  $1$

=  $-1$

→

**Step 1:**  $-2x + 1 = -3x - 2$

**Step 2:**  $-2x + 1 + 3x = -3x - 2 + 3x$

**Step 3:**  $x + 1 = -2$

**Step 4:**  $x + 1 + (-1) = -2 + (-1)$

**Step 5:**  $x = -3$

Solve the problem in the image above to check your understanding of the content.

## Module 5: Solving Linear Equations

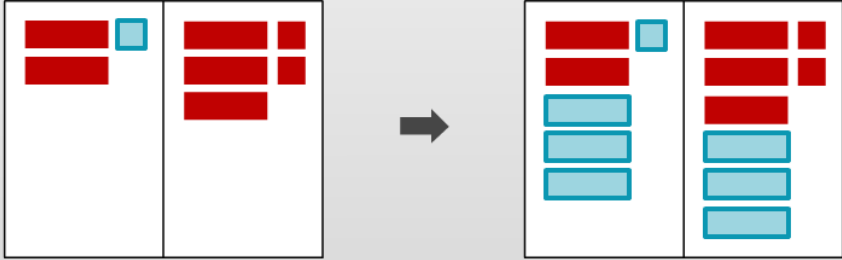
### Topic 2 Content: Solving Equations Using Algebra Tiles

Self-Check: Answer

**Self Check** **Tiles and Steps**

**Correct**

That's correct! The model represents the work between **Step 1** and **Step 2**.



This part of the model represents the equation  $-2x + 1 = -3x - 2$ .

Three blue rectangular tiles have been placed on each side of the equation. This models the addition of  $3x$  to each side of the equation.

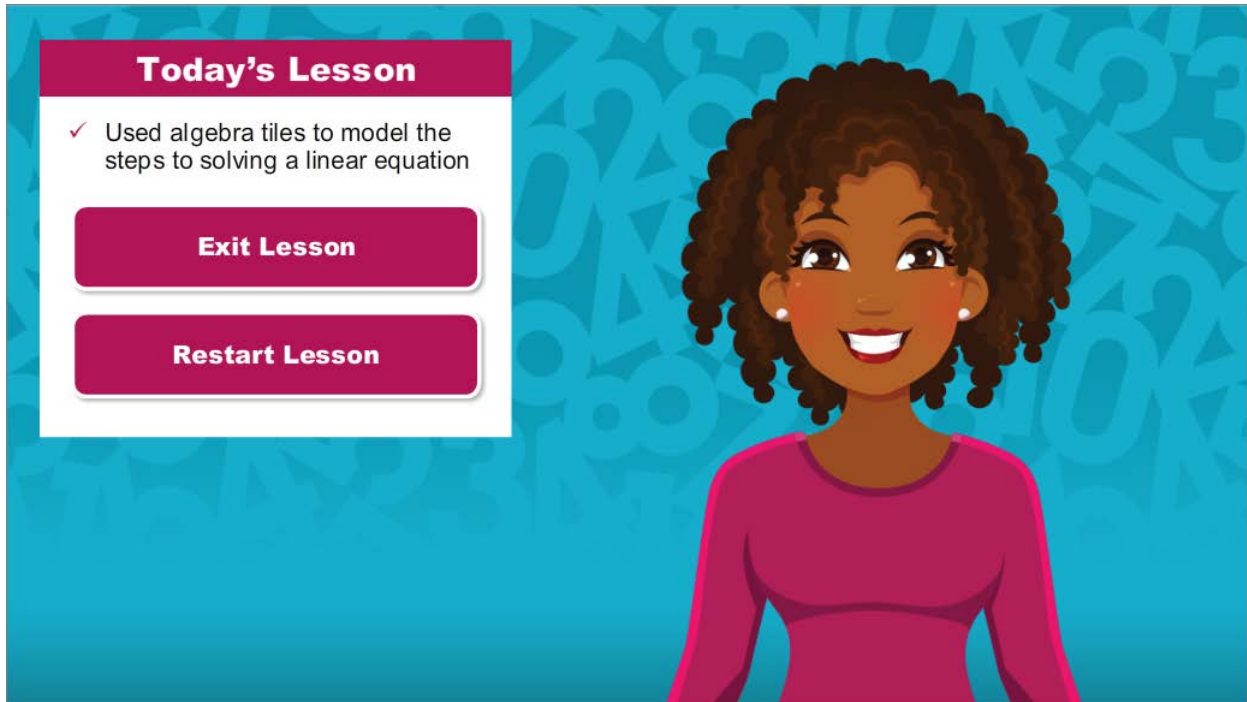
Continue

**SUBMIT**

For your reference, the image above shows the correct solution to the self-check problem.

**Module 5: Solving Linear Equations**  
**Topic 2 Content: Solving Equations Using Algebra Tiles**

**Conclusion**



You have reached the conclusion of this lesson where you used algebra tiles to model the steps to solving an equation.