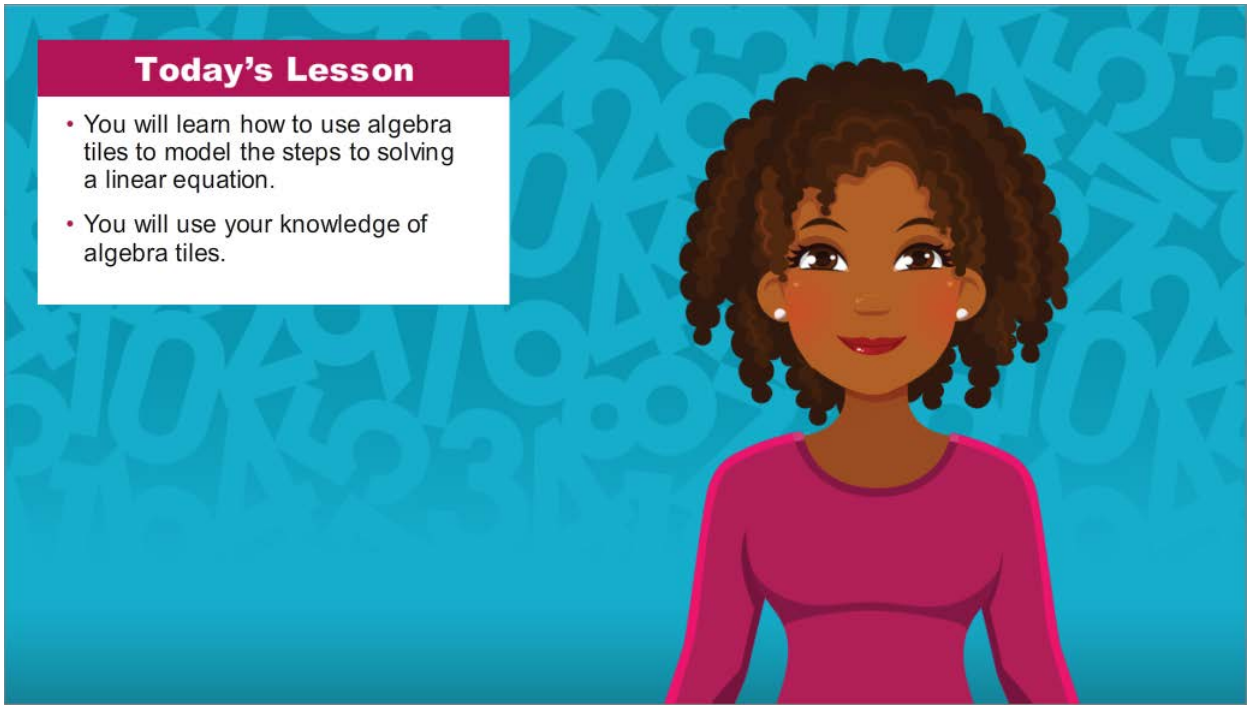
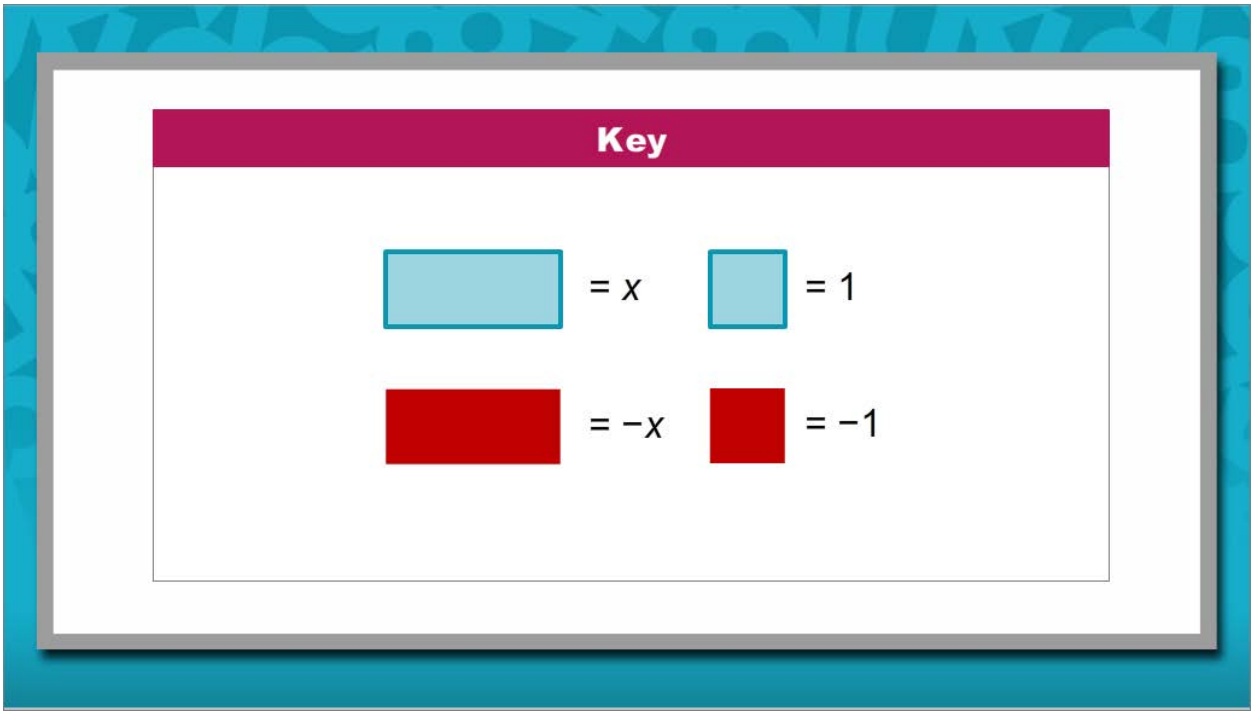
Module 5: Solving Linear Equations
Topic 2 Content: Solving Equations Using Algebra Tiles

Introduction



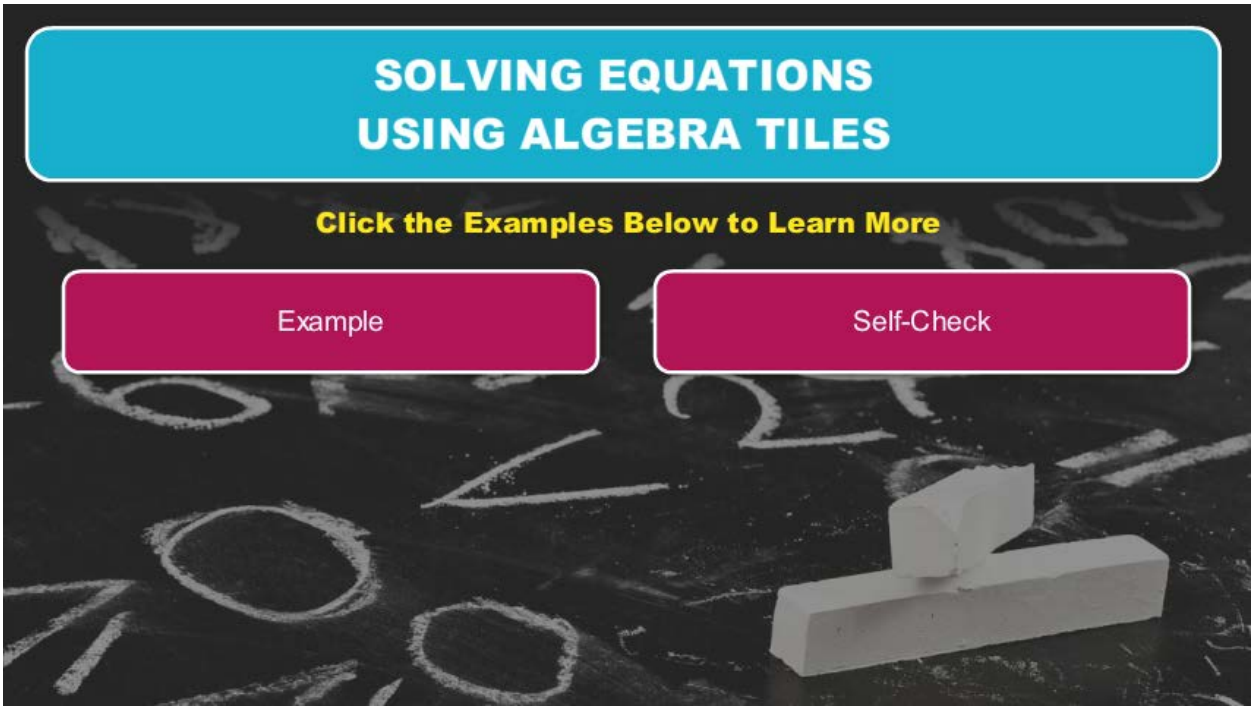
Hi there! I'm so glad you could join me for this lesson in Algebra I, where you will learn how to use algebra tiles to model the steps to solving an equation.

Anticipatory Set



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

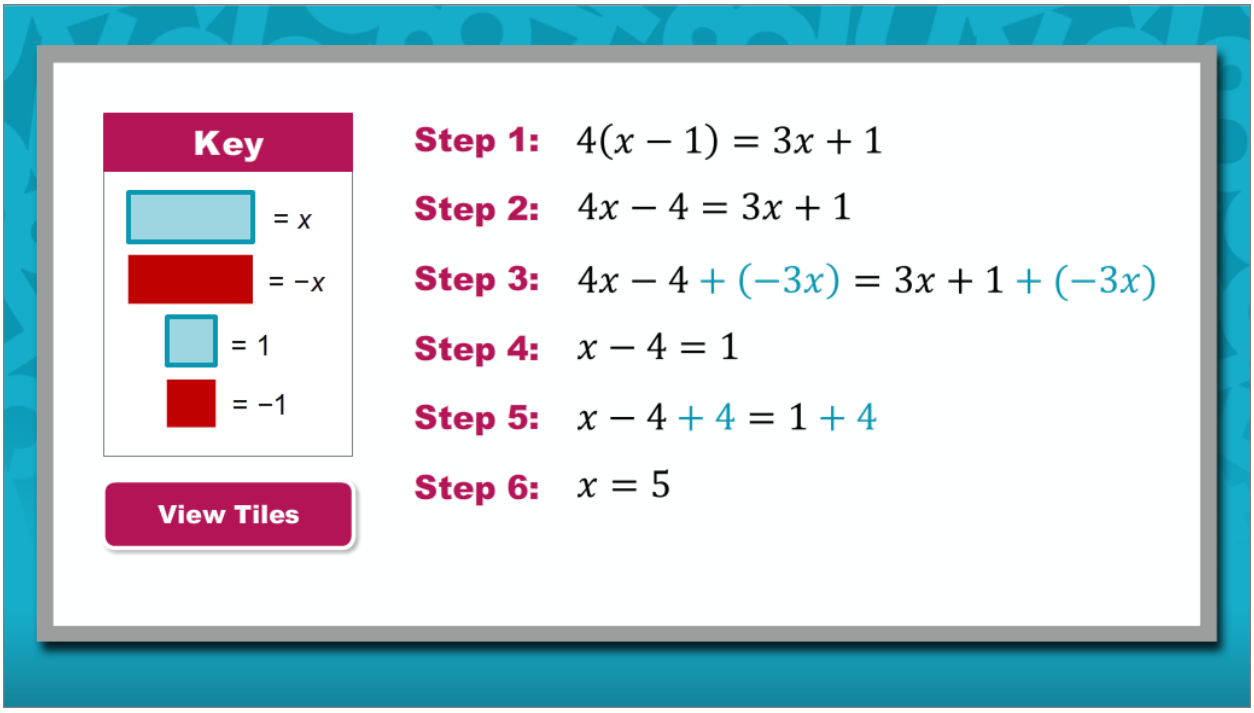
Solving Equations Using Algebra Tiles



Click the examples below to learn more.

- Example
- Self-Check

Example: Steps



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: $4x-4=3x+1$

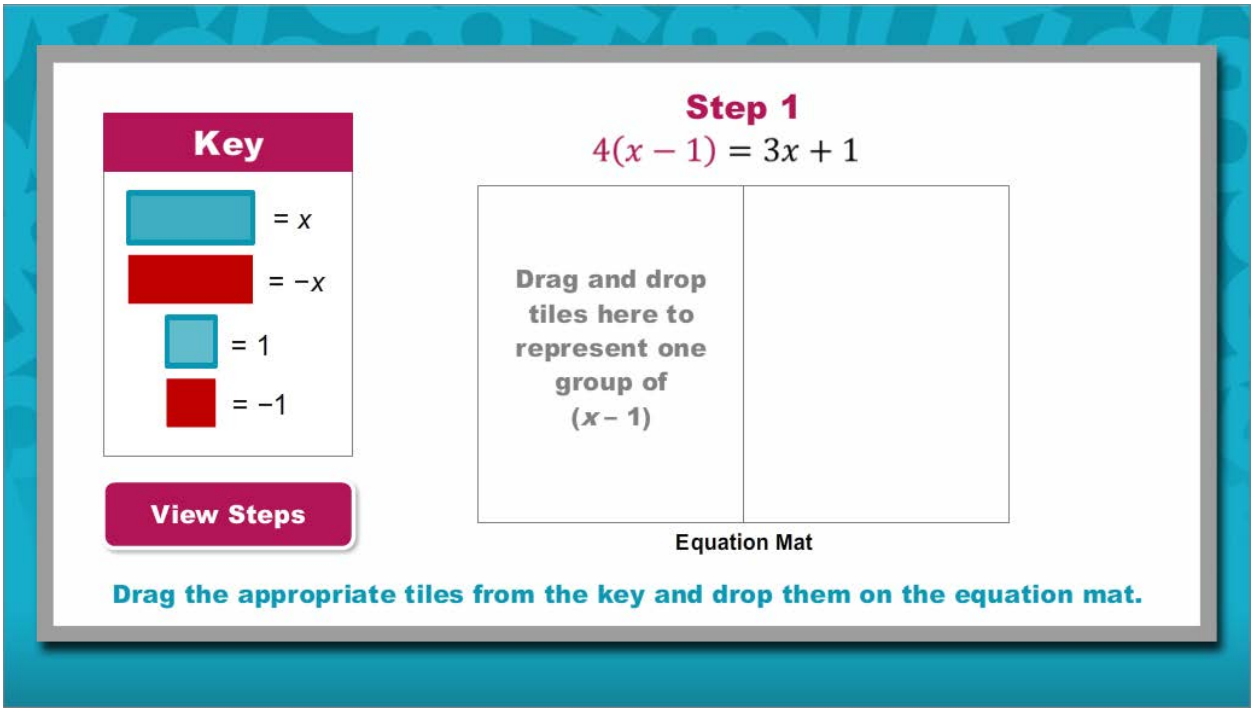
Step 3: $4x-4+(-3x)=3x+1+(-3x)$

Step 4: $x-4=1$

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

Step 6: $x=5$

Example

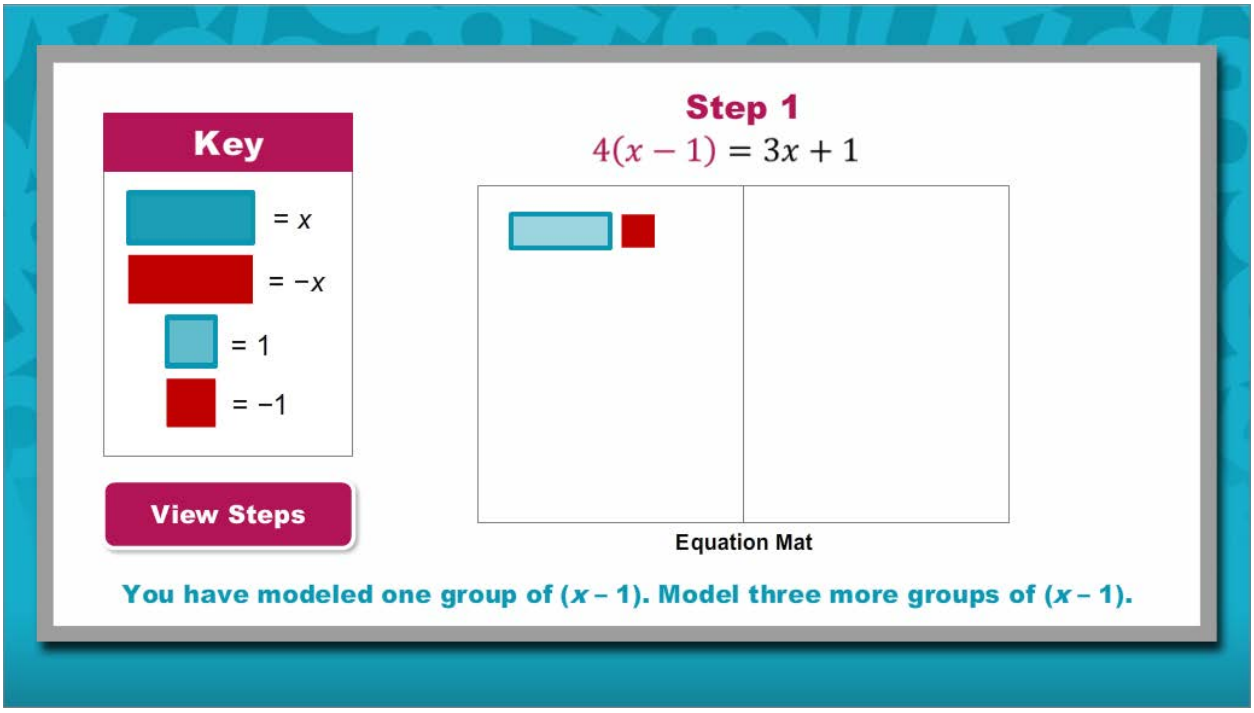


To set up the equation on the equation mat, begin my interpreting Step 1. Notice that the left side of the equation includes parentheses. You can interpret, $4(x-1)$, to mean 4 groups of $(x-1)$.

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

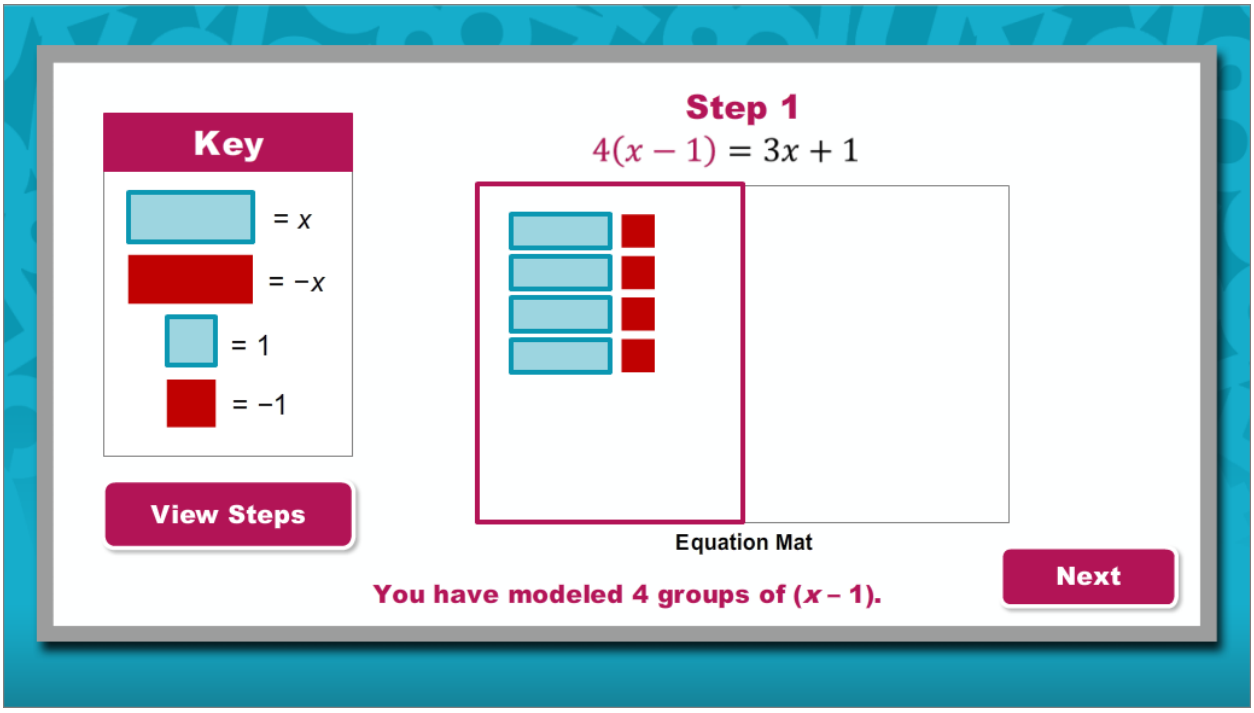
Drag the appropriate tiles from the key and drop them on the equation mat. The steps to solving the equation are on page 4 for your review.

Example (continued)



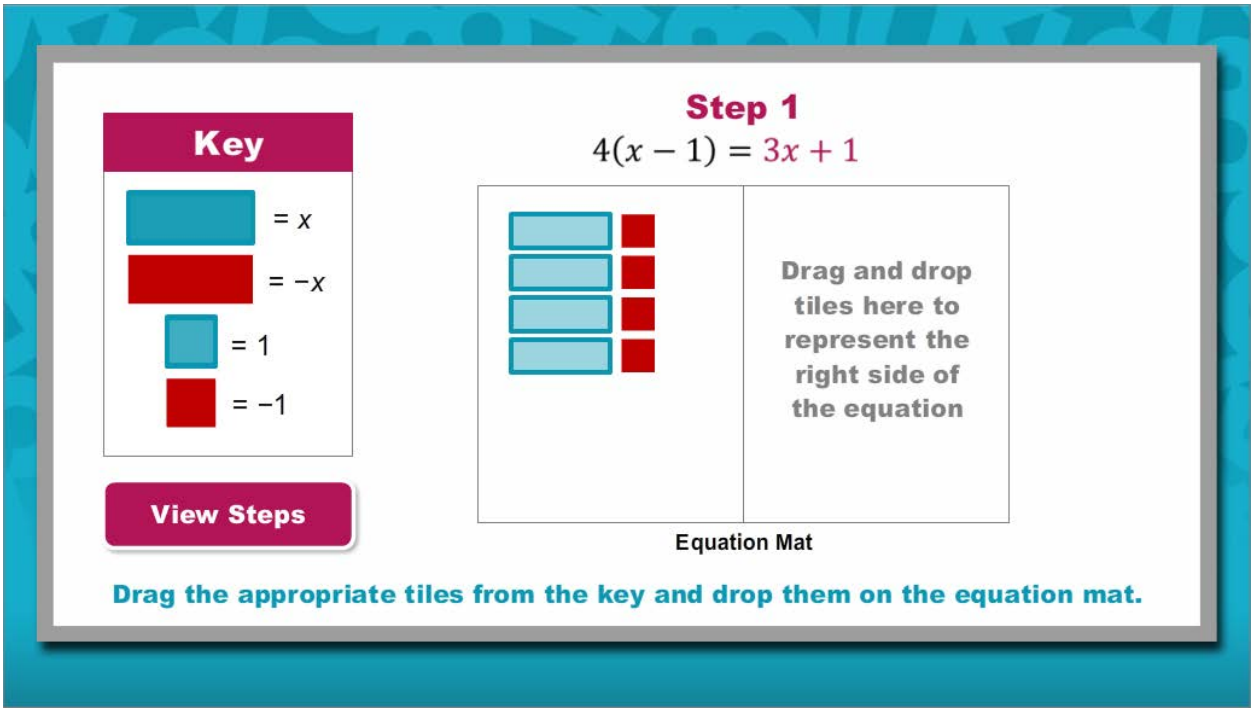
You have modeled one group of $(x - 1)$. Model three more groups of $(x - 1)$.

Example (continued)



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

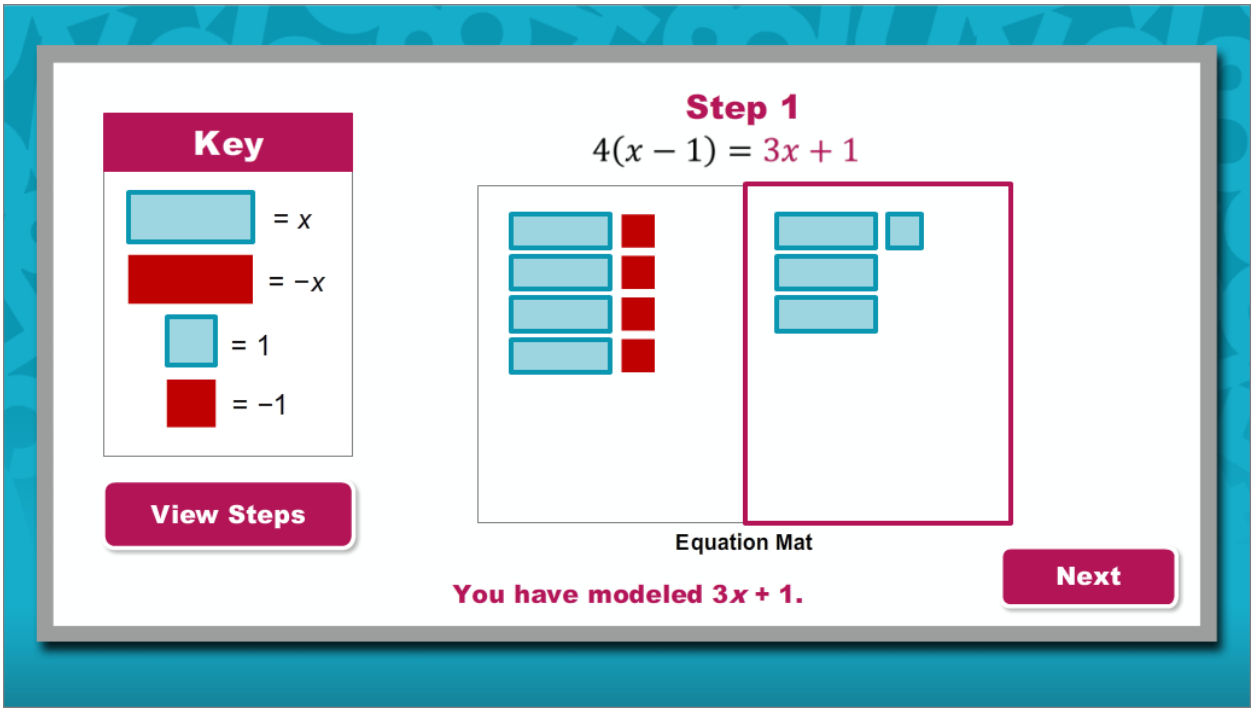
Example (continued)



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

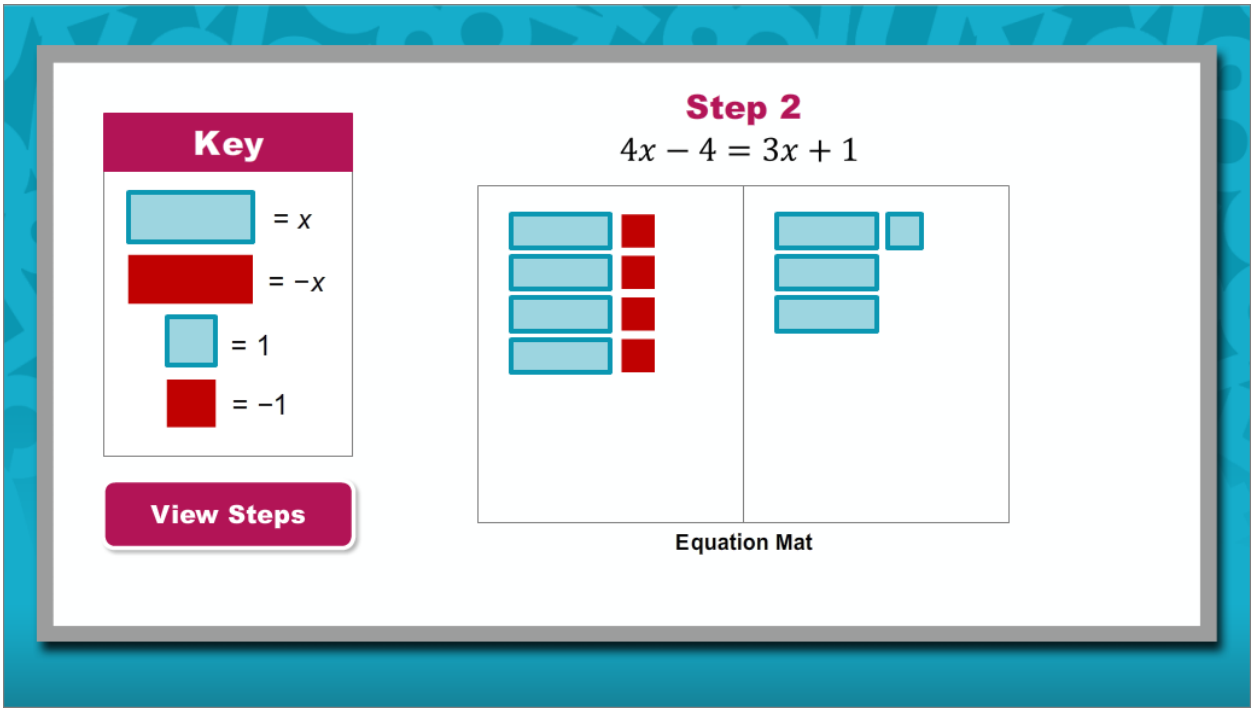
Drag the appropriate tiles from the key and drop them on the equation mat. The steps to solving the equation are on page 4 for your review.

Example (continued)



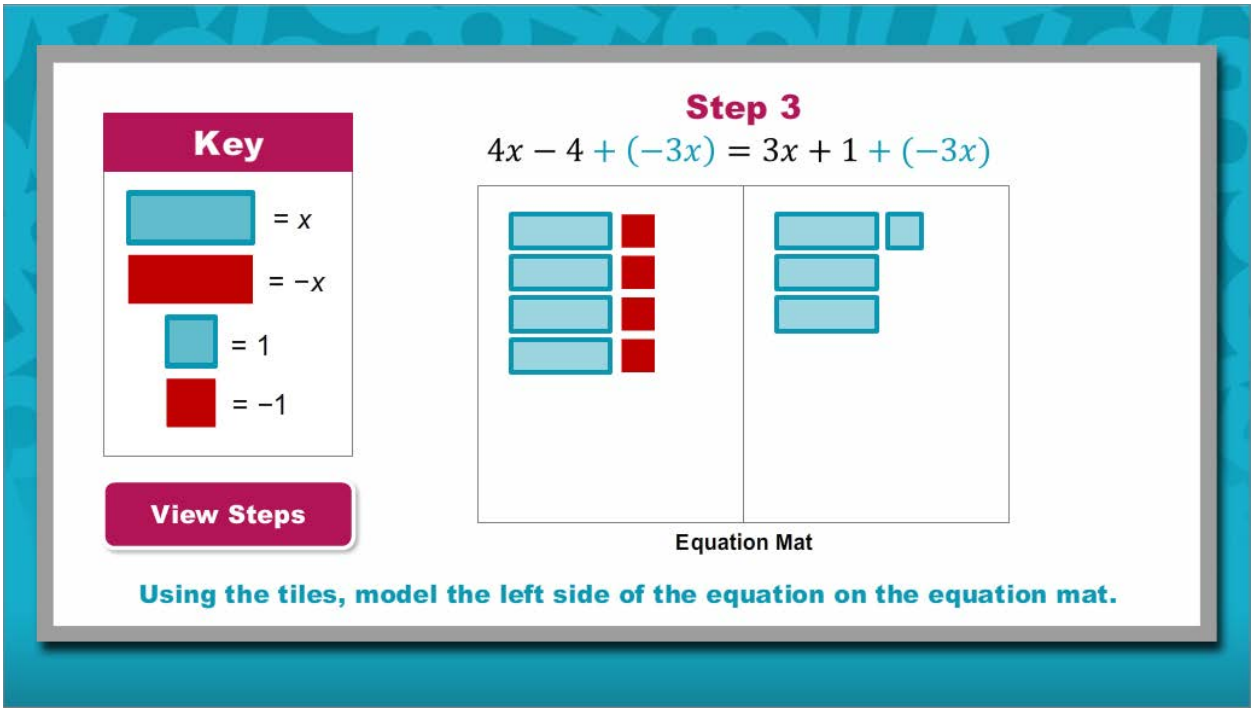
You have modeled $3x + 1$.

Example (continued)



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.

Example (continued)

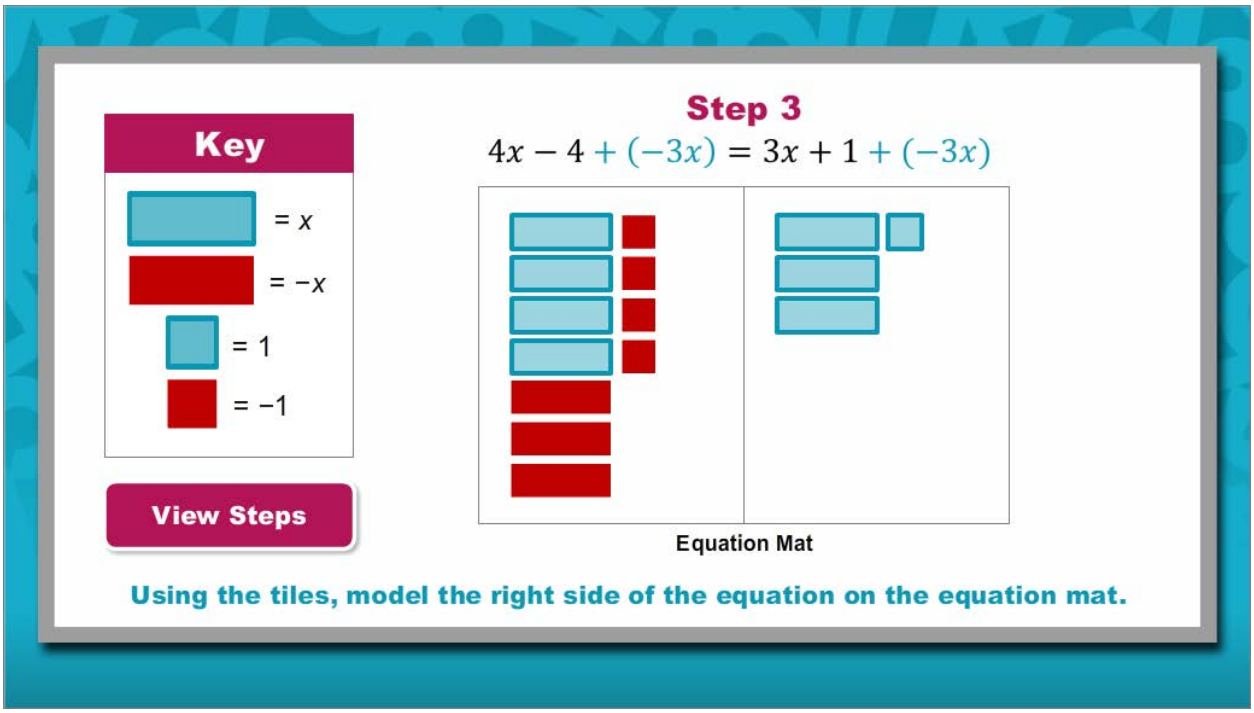


As you know, when solving a linear equation algebraically, the goal is typically to end with the variable on the left side of the equation and a numerical value on the right. The goal is the same when using algebra tiles to solve an equation.

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.

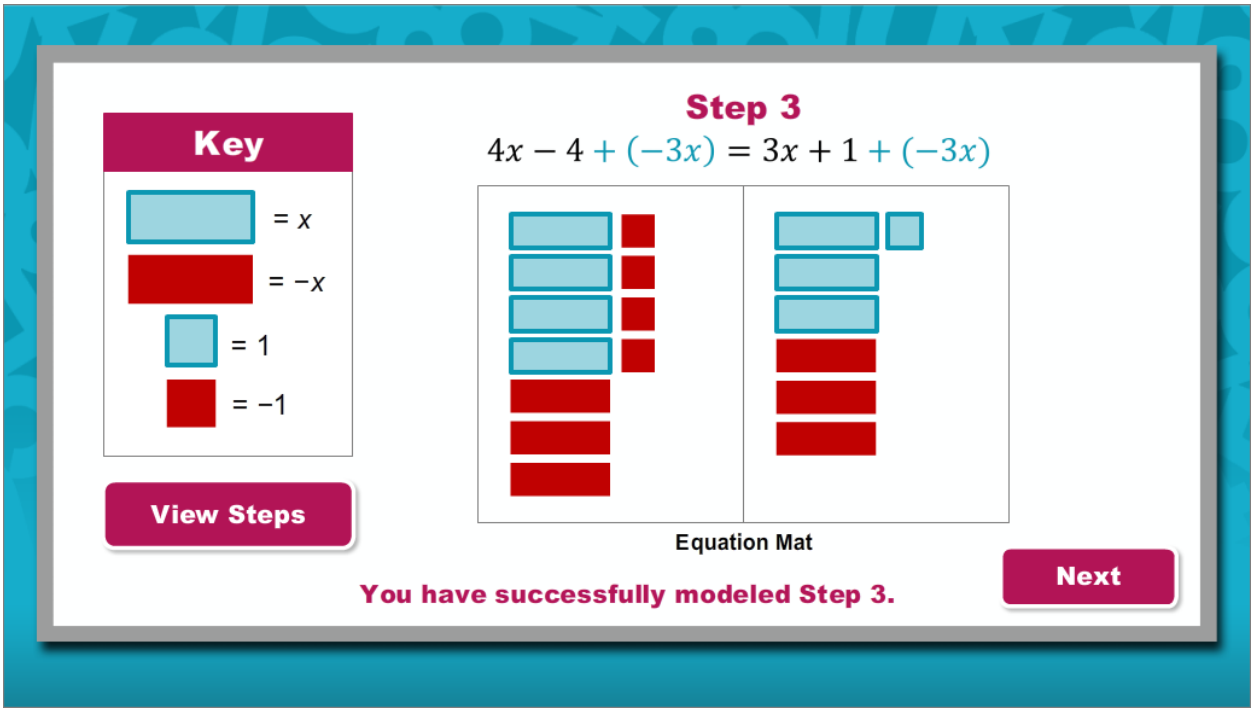
Using the tiles, model the left side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

Example (continued)



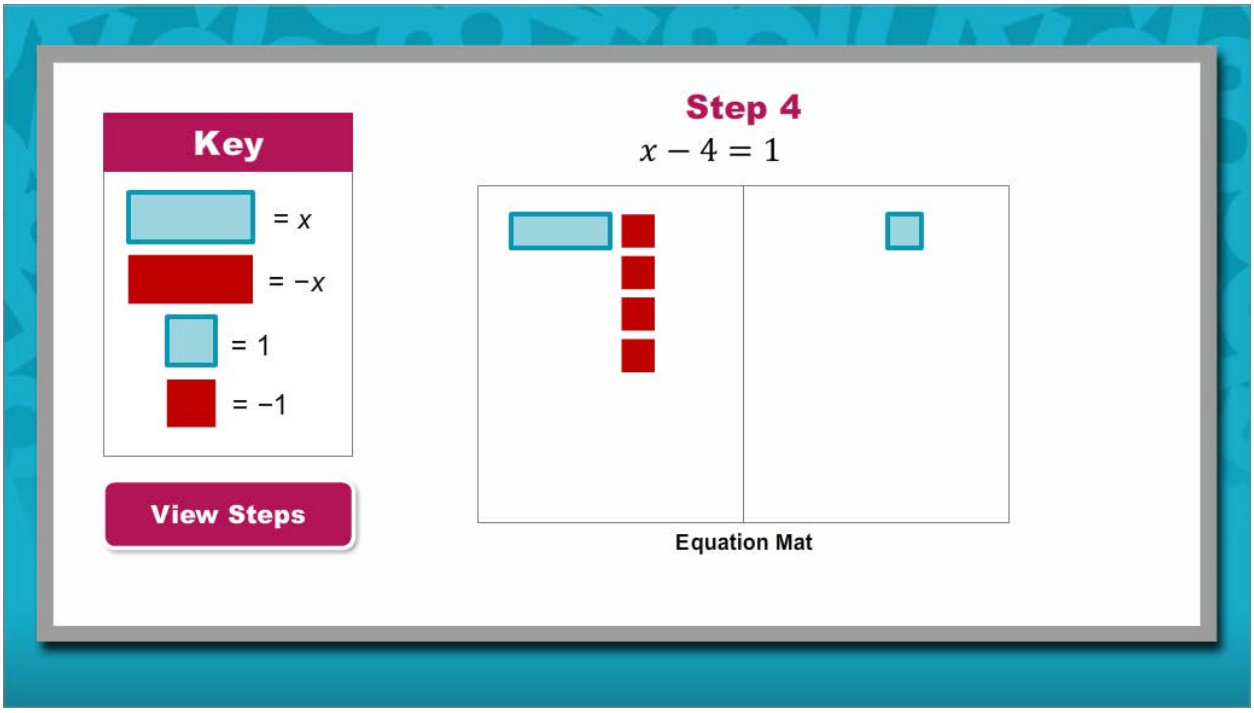
Using the tiles, model the right side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

Example (continued)



You have successfully modeled Step 3.

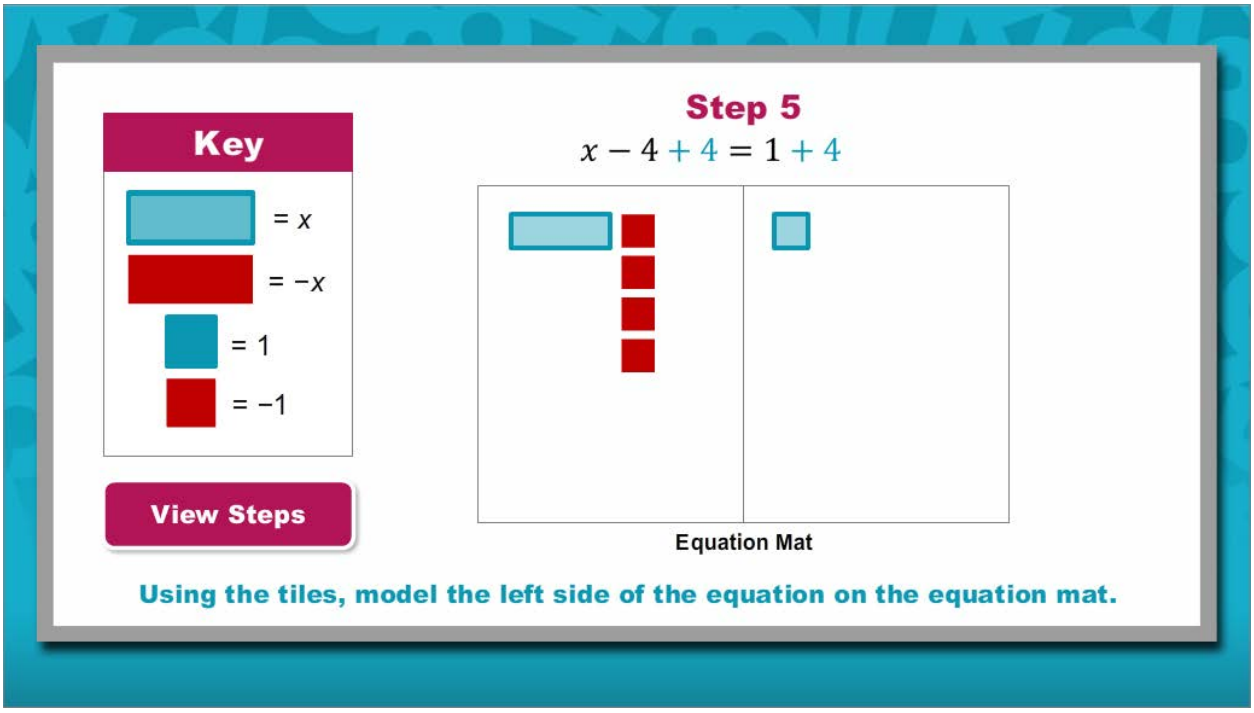
Example (continued)



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.

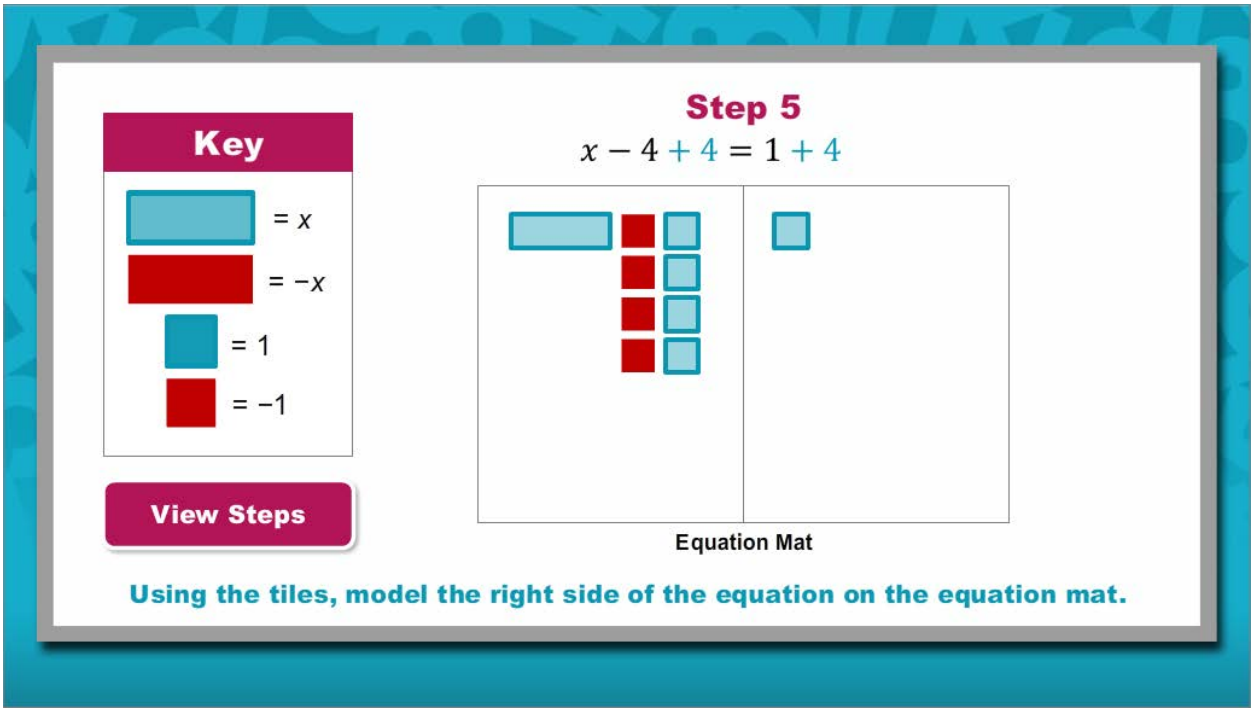
Example (continued)



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.

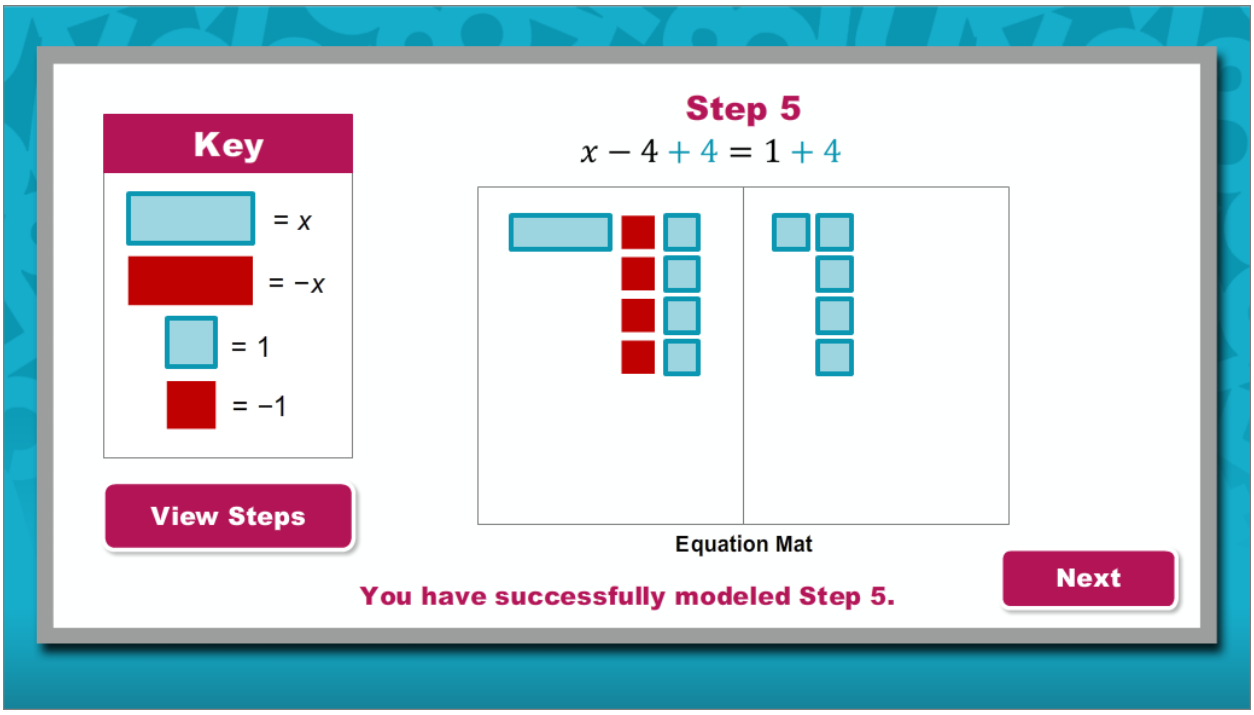
Using the tiles, model the left side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

Example (continued)



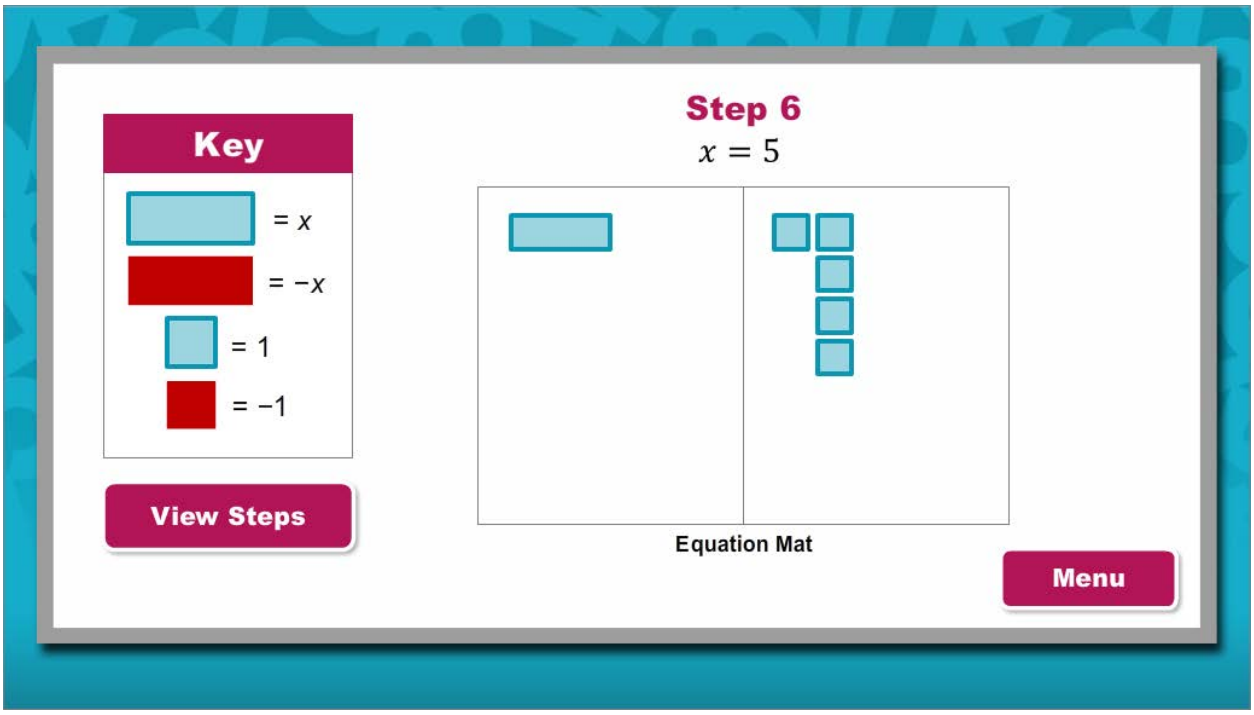
Using the tiles, model the right side of the equation on the equation mat. The steps to solving the equation are on page 4 for your review.

Example (continued)



You have successfully modeled Step 5.

Example (continued)

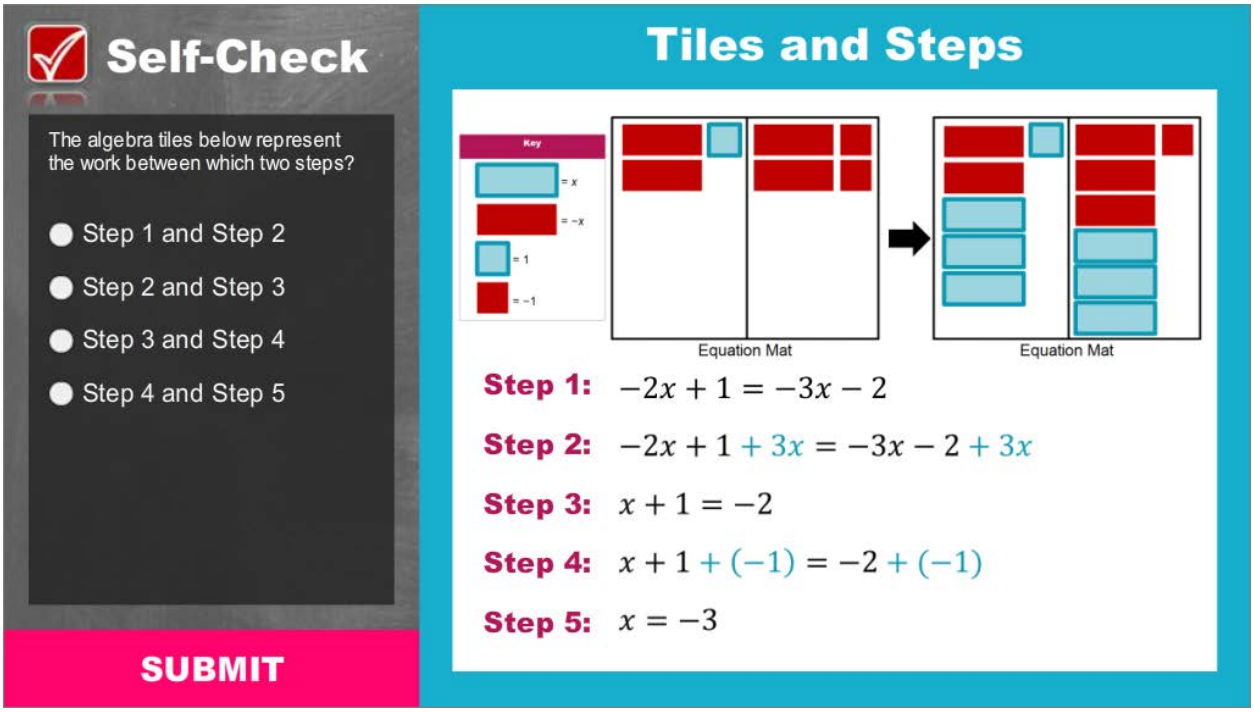


Adding 4 to the left side of the equation mat creates 4 zero pairs. The result is x.

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

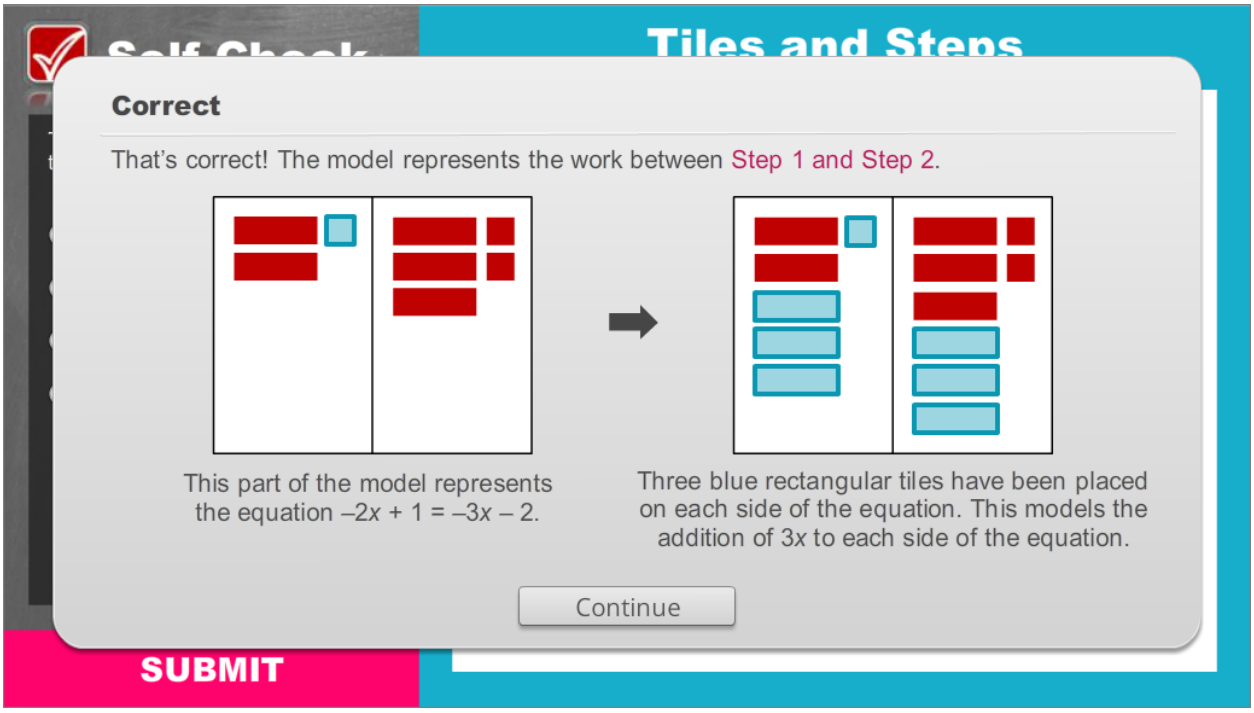
You have arrived at the final step. The solution is $x = 5$.

Self-Check



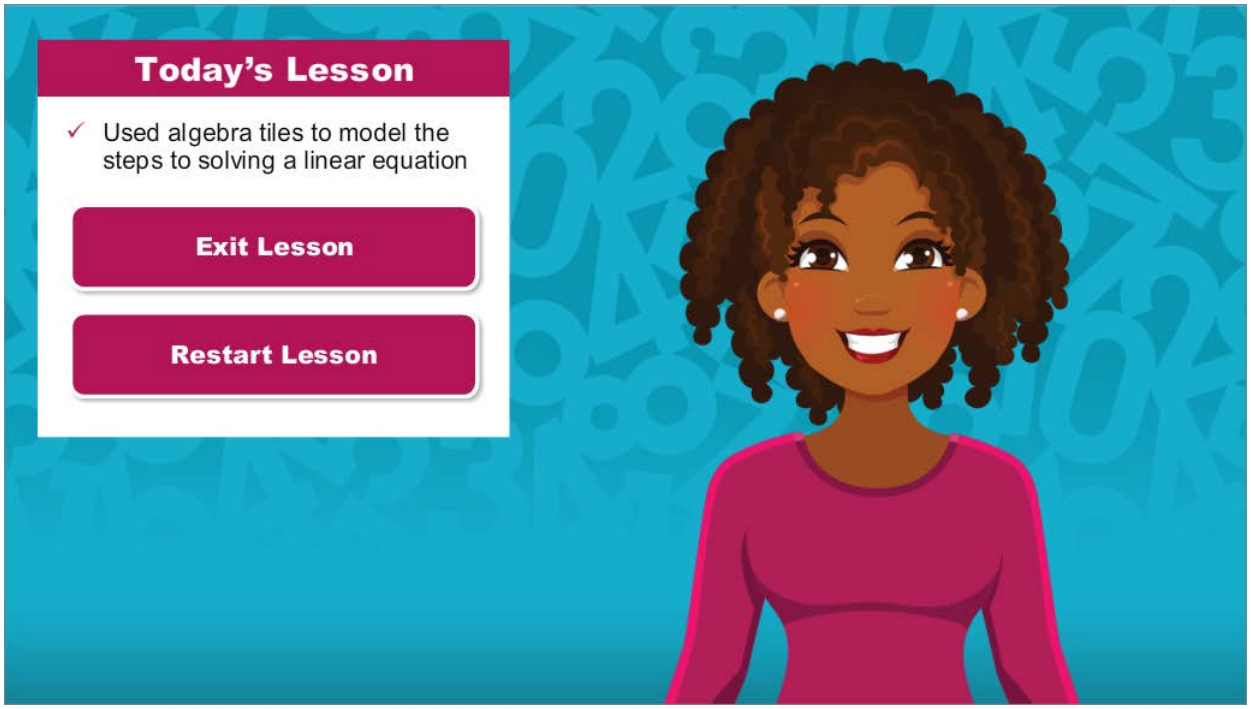
Solve the problem in the image above to check your understanding of the content.

Self-Check: Answer



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

Conclusion



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