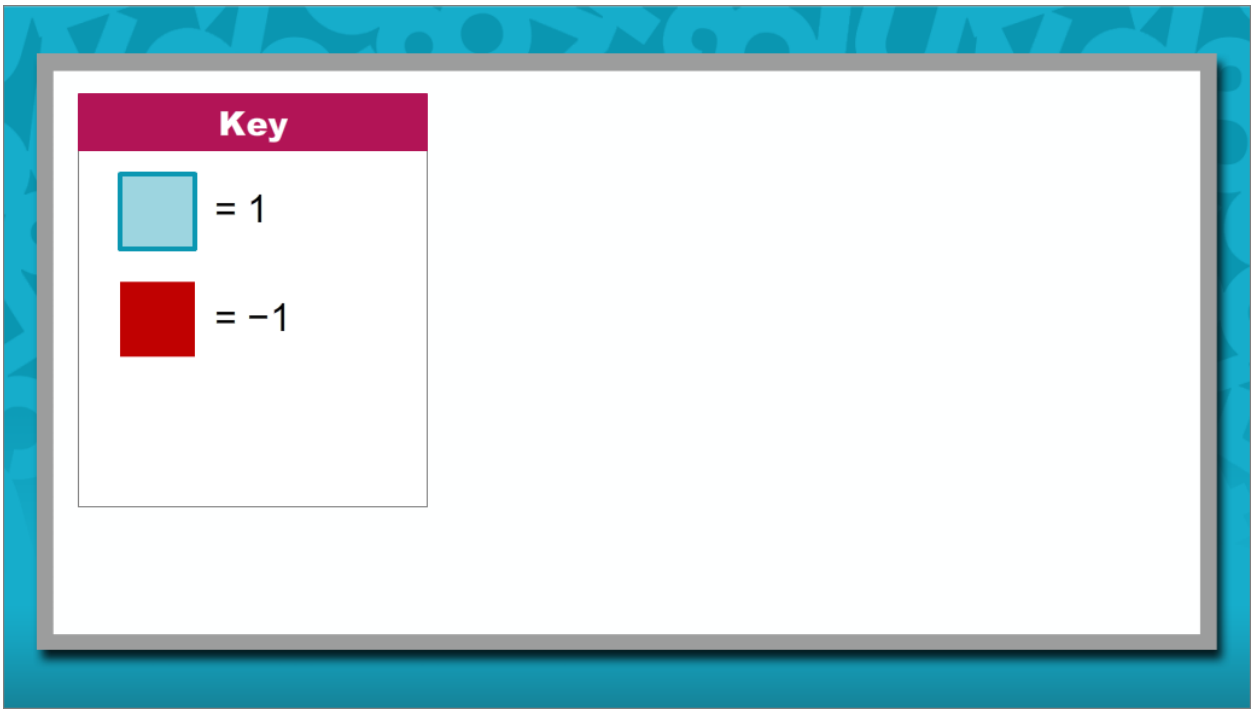
Module 1: Expressions
Topic 3: Algebra Tiles

Introduction

Hello and welcome! I'm so glad to have you here for this lesson in Algebra I, where you will learn how to use algebra tiles to model and evaluate algebraic expressions for given replacement values. Your knowledge of how to use algebra tiles to model integer operations will be a useful skill during this lesson.

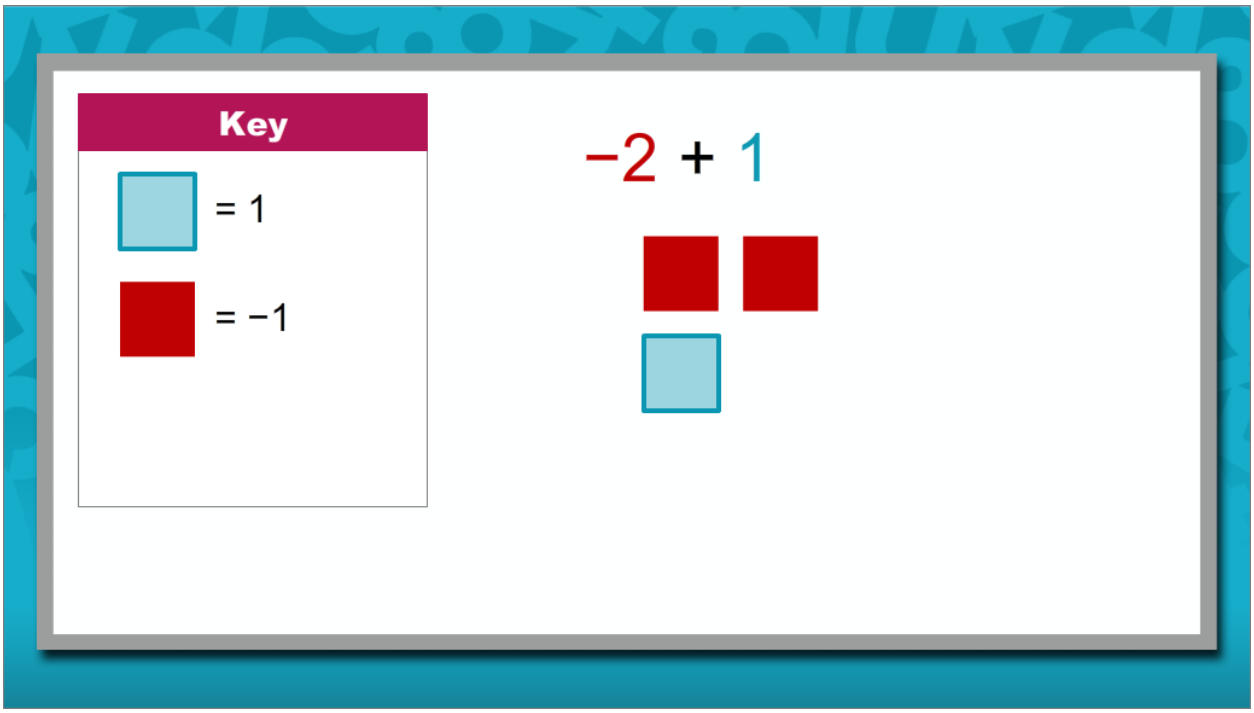
Module 1: Expressions
Topic 3: Algebra Tiles

Anticipatory Set



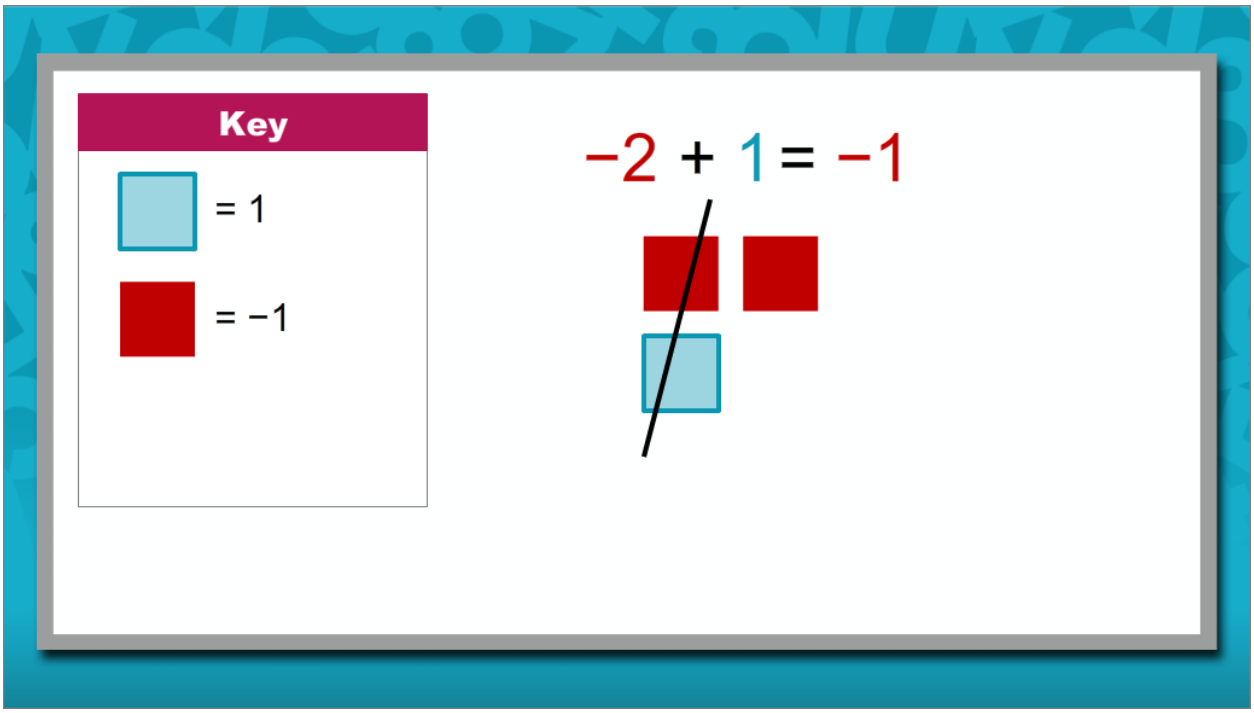
You are most likely familiar with the use of algebra tiles to model integer operations. For example, let a blue square tile represent positive one, +1, and a red square tile represent negative one, −1.

Anticipatory Set (continued)



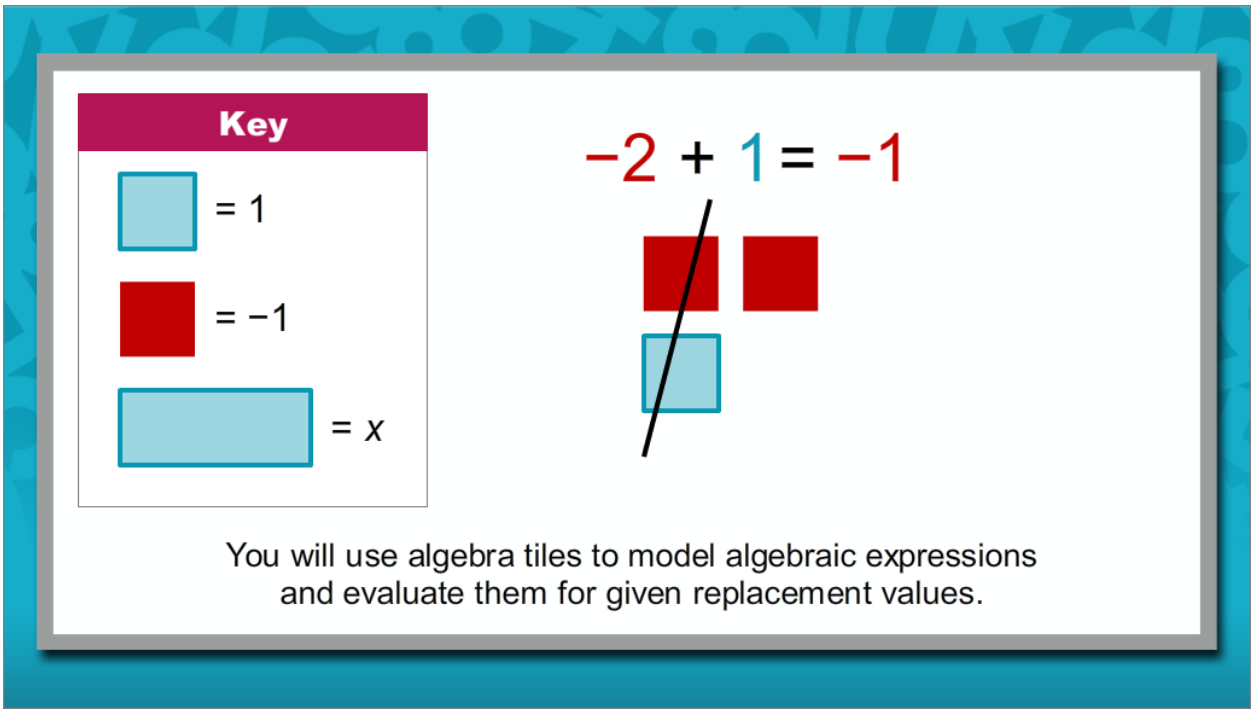
The numeric expression "−2 + 1" can be modeled by two red square tiles together with one blue square tile.

Anticipatory Set (continued)



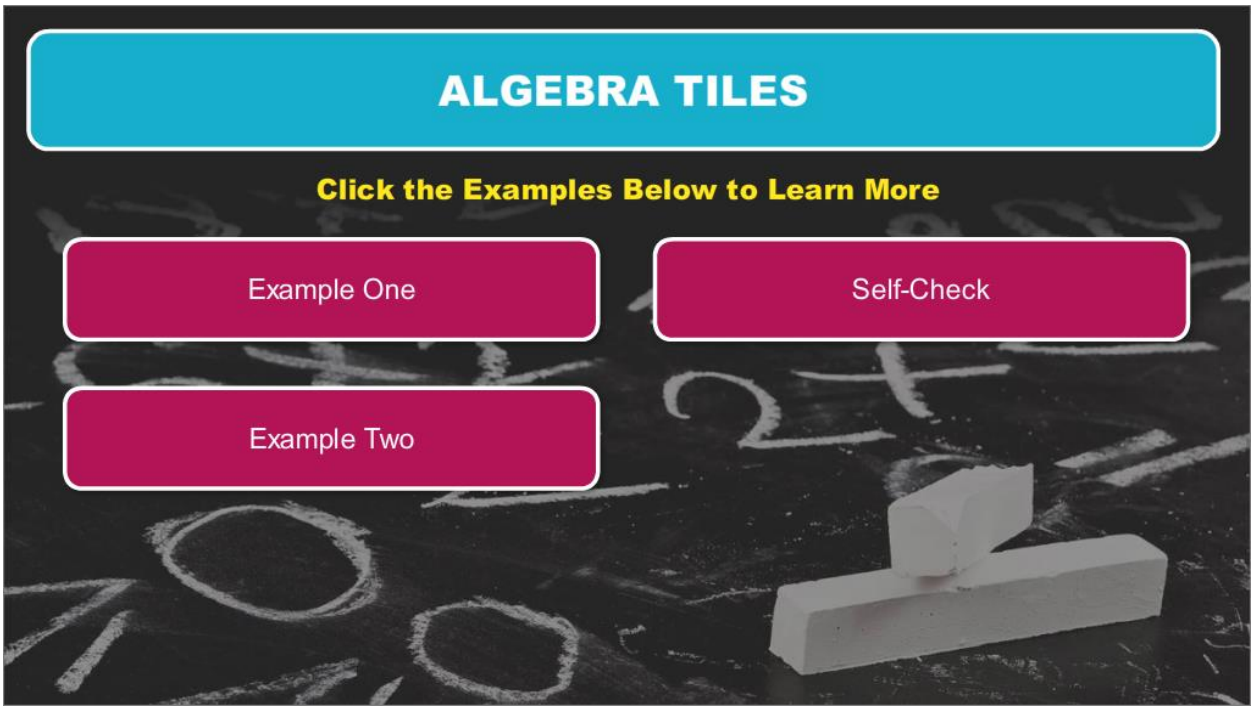
You can then use your knowledge of zero pairs to simplify the numeric expression and determine that it has a value of −1.

Anticipatory Set (continued)



In the following examples, you will use algebra tiles to model algebraic expressions and evaluate them for given replacement values. A blue rectangular tile will be used to represent x.

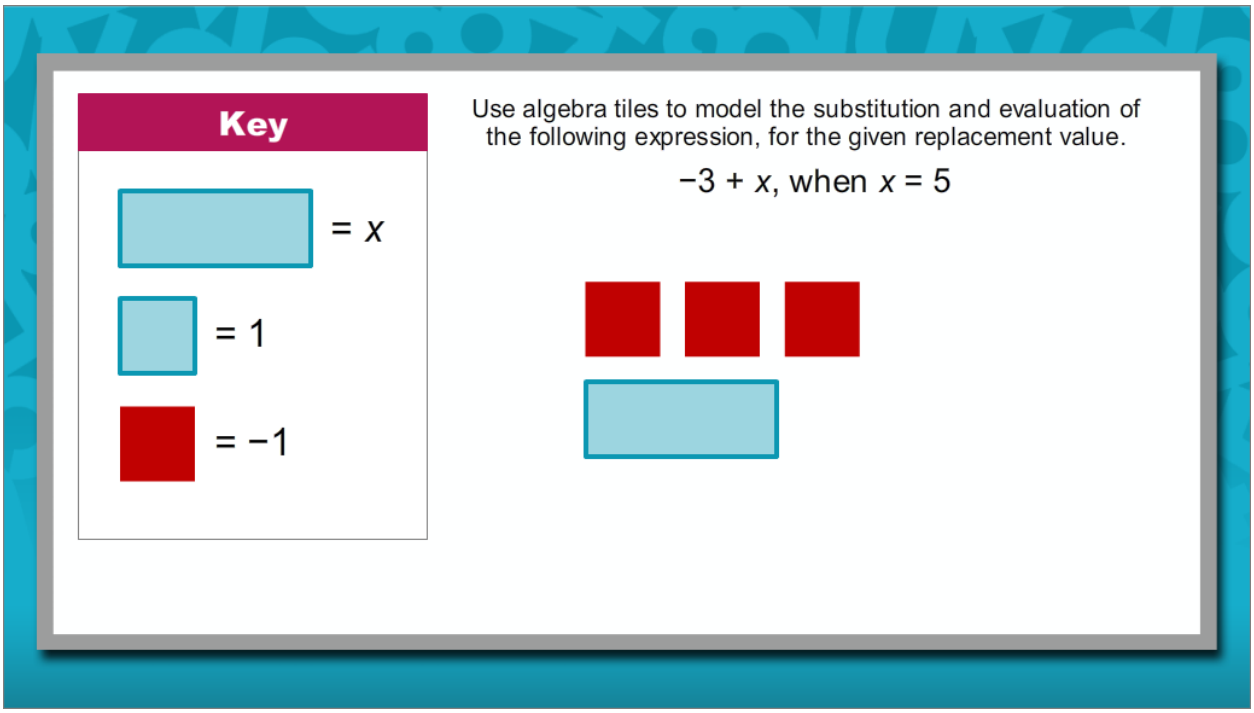
Algebra Tiles



Click the examples below to learn more.

- Example 1
- Example 2
- Self-Check

Example 1

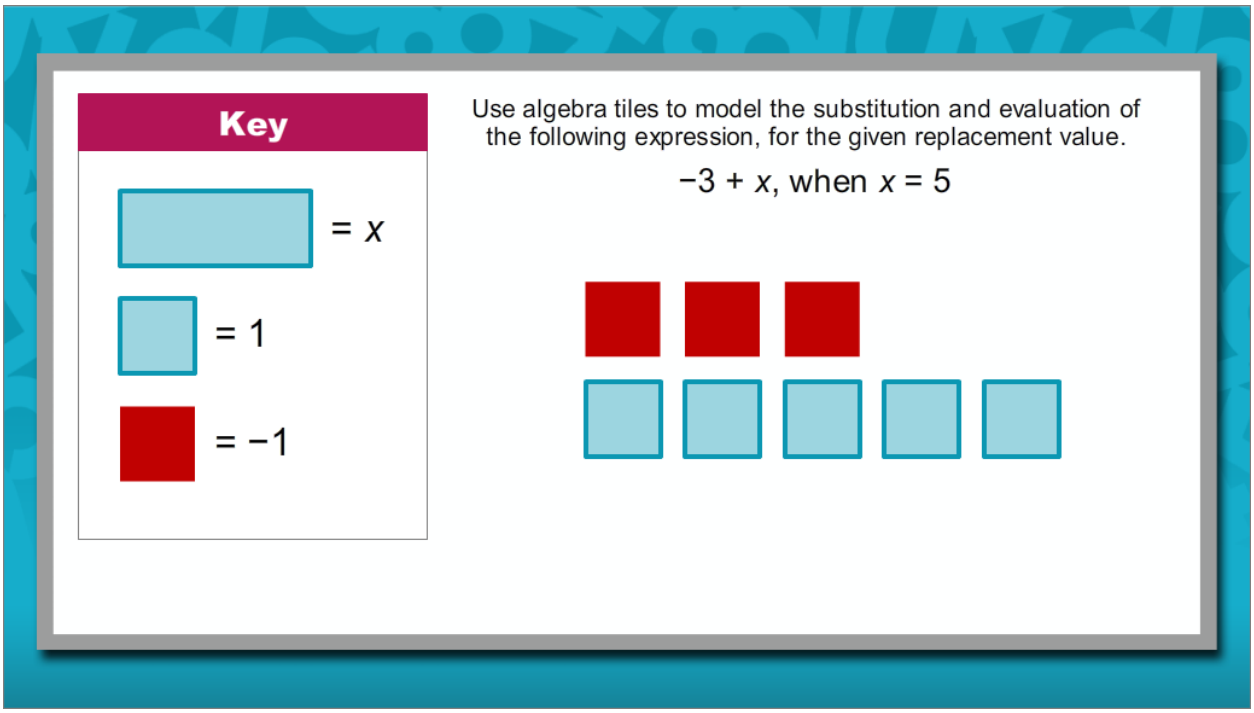


Use algebra tiles to model the substitution and evaluation of the following expression, for the given replacement value.

$$-3 + x, \text{ when } x = 5$$

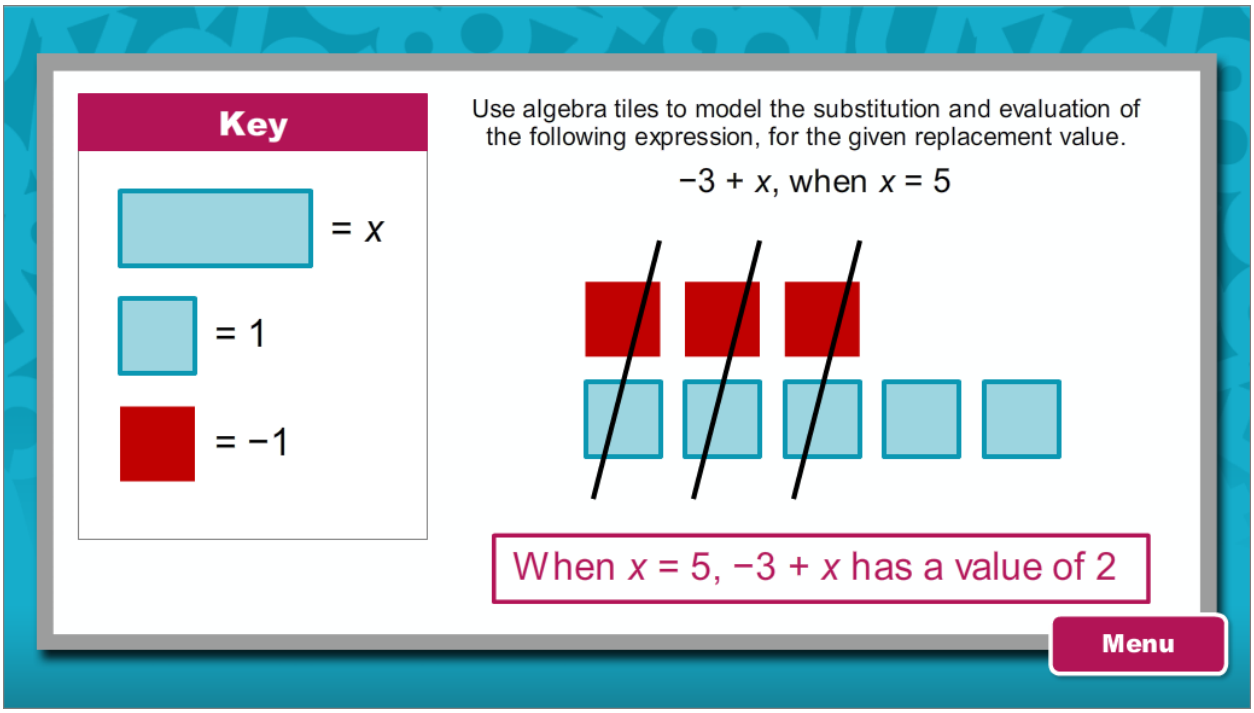
Begin by using algebra tiles to model the algebraic expression "$-3 + x$." To represent -3, you will need three red squares. To represent x, you will need one rectangle.

Example 1 (continued)



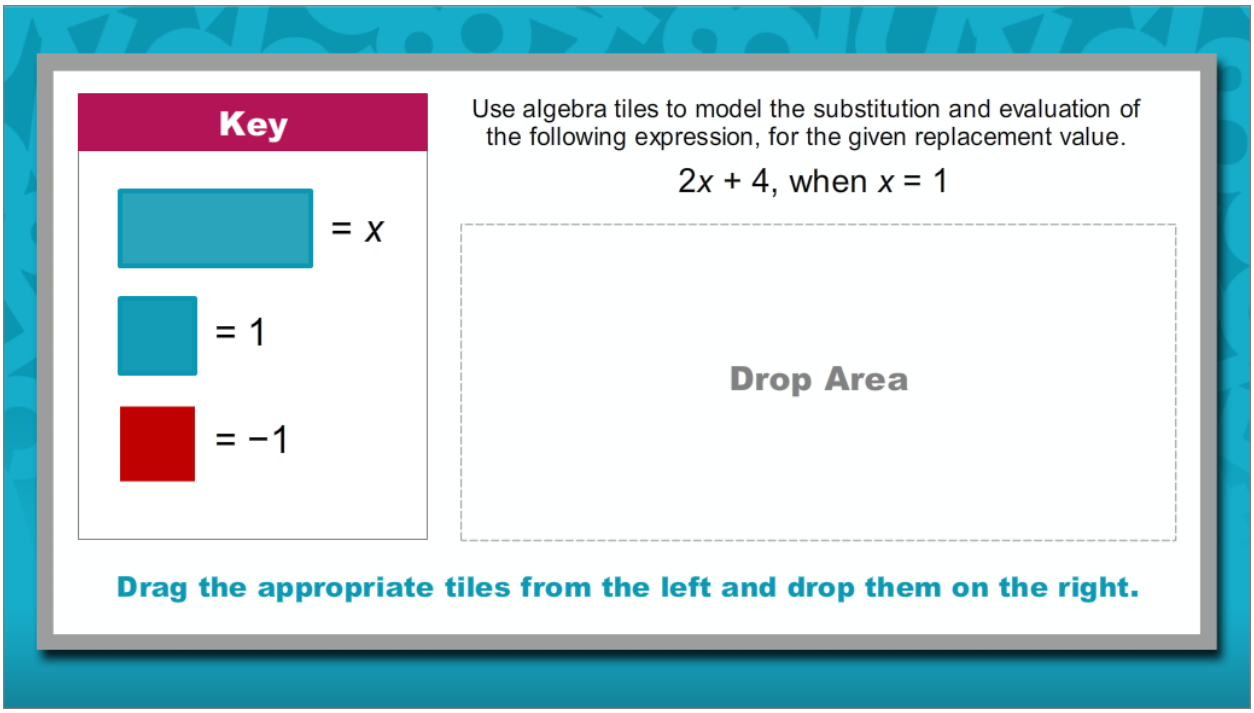
Now perform the substitution. The problem states that x is equal to 5. So replace the rectangle with five blue squares.

Example 1 (continued)



Because the remaining tiles represent both positive and negative values of one, you must use your knowledge of zero pairs to simplify. In this model, there are three zero pairs. After eliminating these zero pairs, two blue squares remain. Therefore, when $x = 5$, the expression "$-3 + x$" has a value of 2.

Example 2

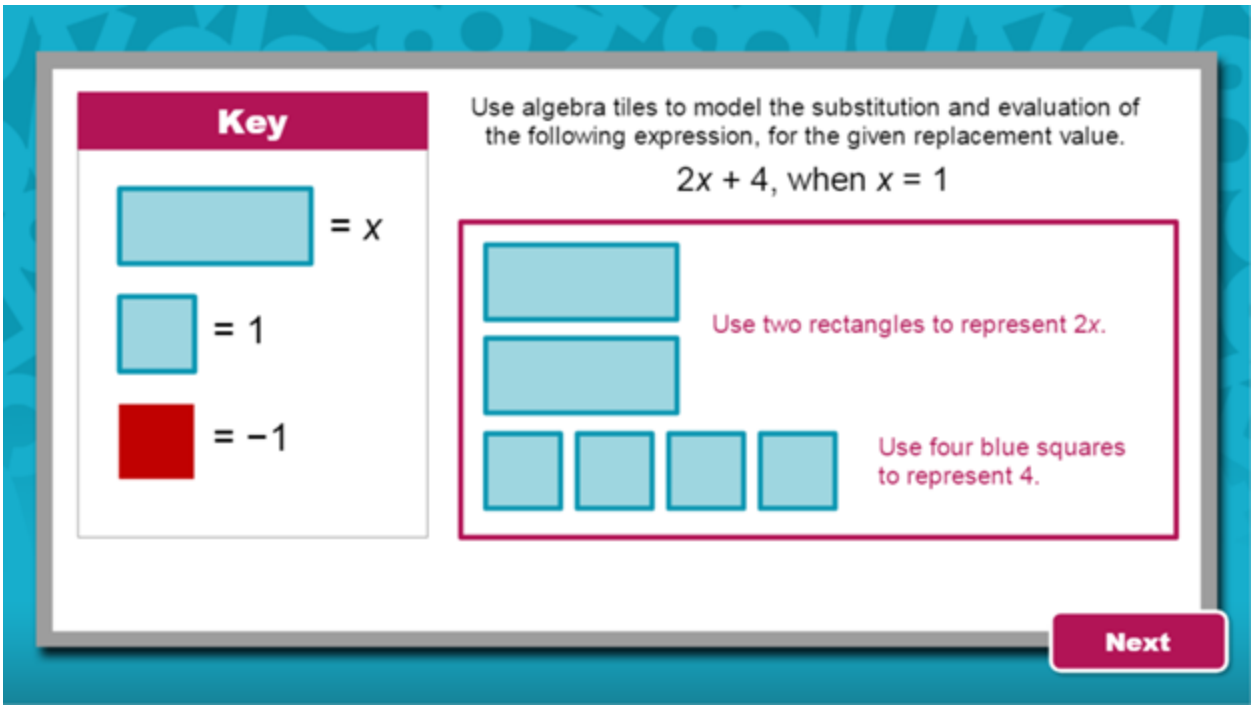


Use algebra tiles to model the substitution and evaluation of the following expression, for the given replacement value.

$$2x + 4, \text{ when } x = 1$$

First, drag and drop the correct tiles to represent the expression "$2x + 4$." Drag the appropriate tiles from the left and drop them on the right.

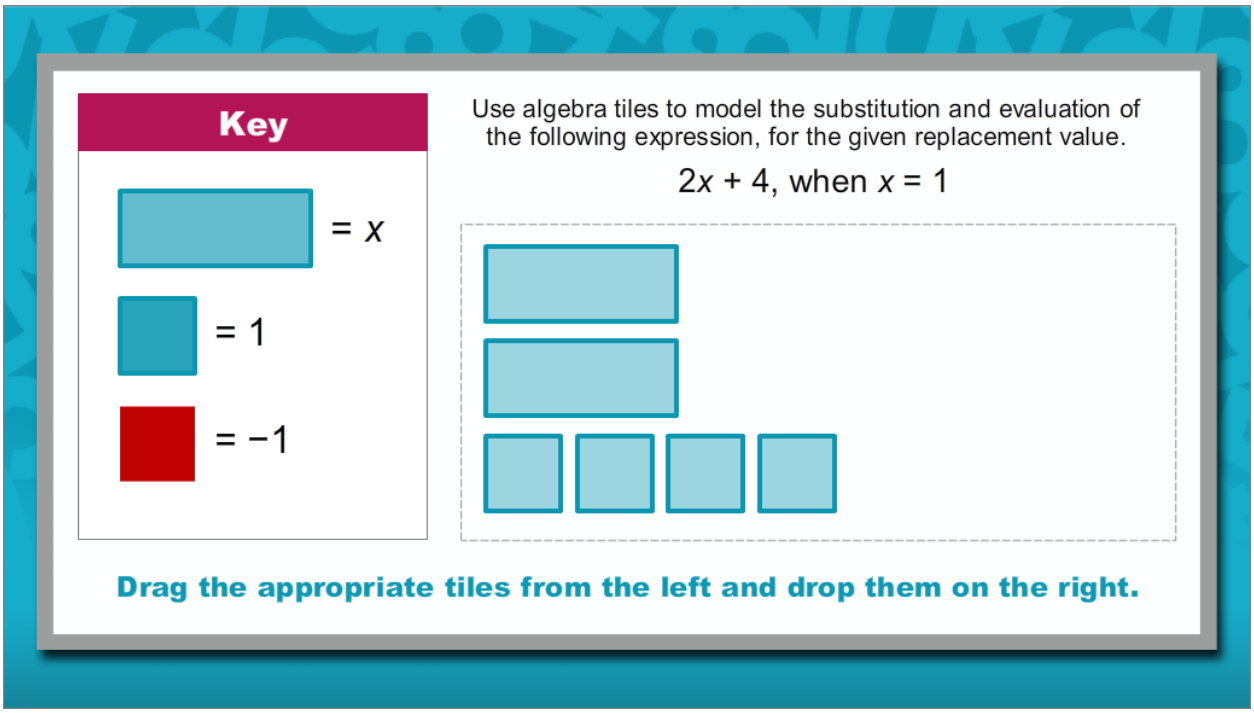
Example 2 (continued)



To represent the expression "$2x + 4$":

- Use two rectangles to represent $2x$.
- Use four blue squares to represent 4.

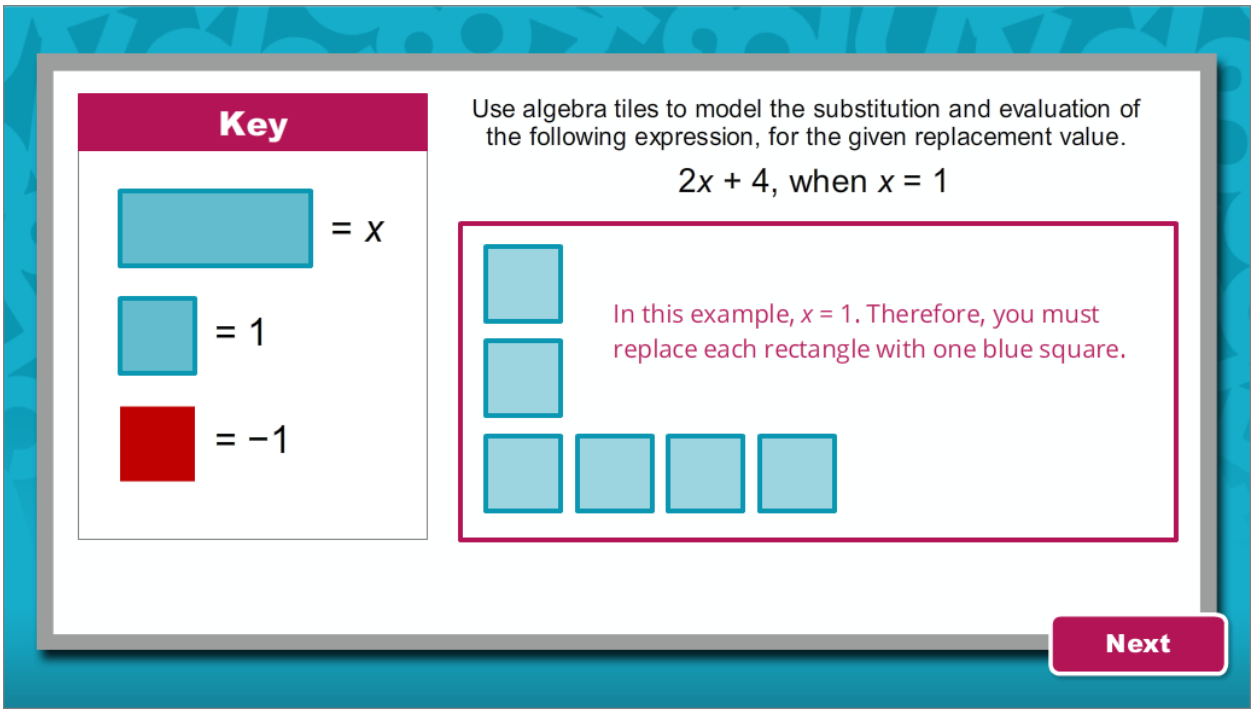
Example 2 (continued)



Now perform the substitution. The problem states that x is equal to 1, so replace each rectangle with the appropriate tile.

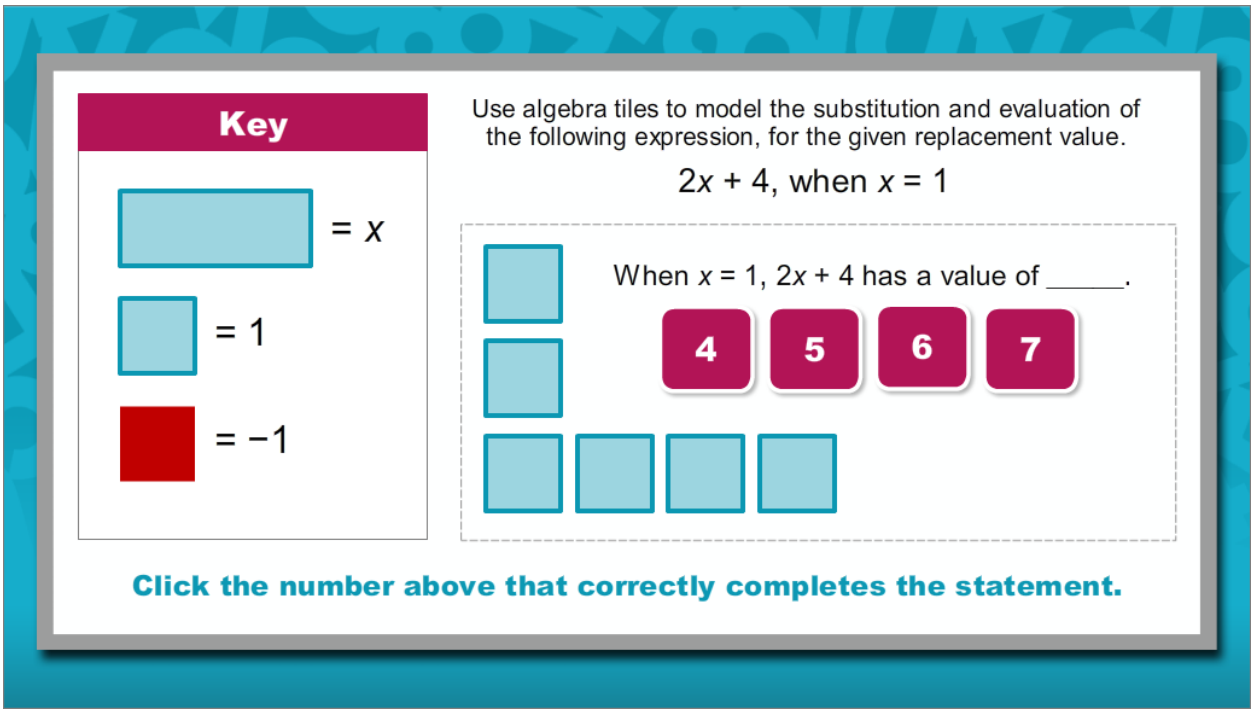
Drag the appropriate tiles from the left and drop them on the right.

Example 2 (continued)



In this example, you must evaluate "$2x + 4$" when $x = 1$. Therefore, you must replace each rectangle with one blue square.

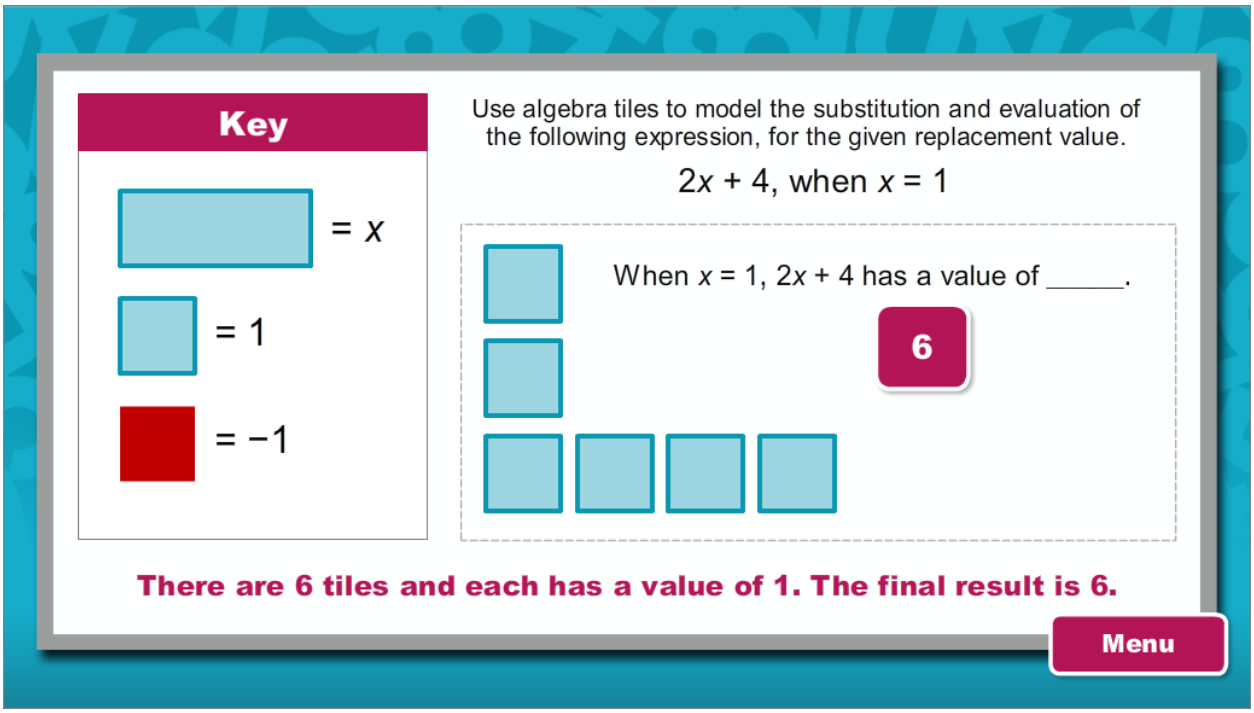
Example 2 (continued)



Now simplify. After performing the substitution, your model includes six tiles that each represent a value of $+1$. Therefore, when $x = 1$, the expression "$2x + 4$" has a value of ?

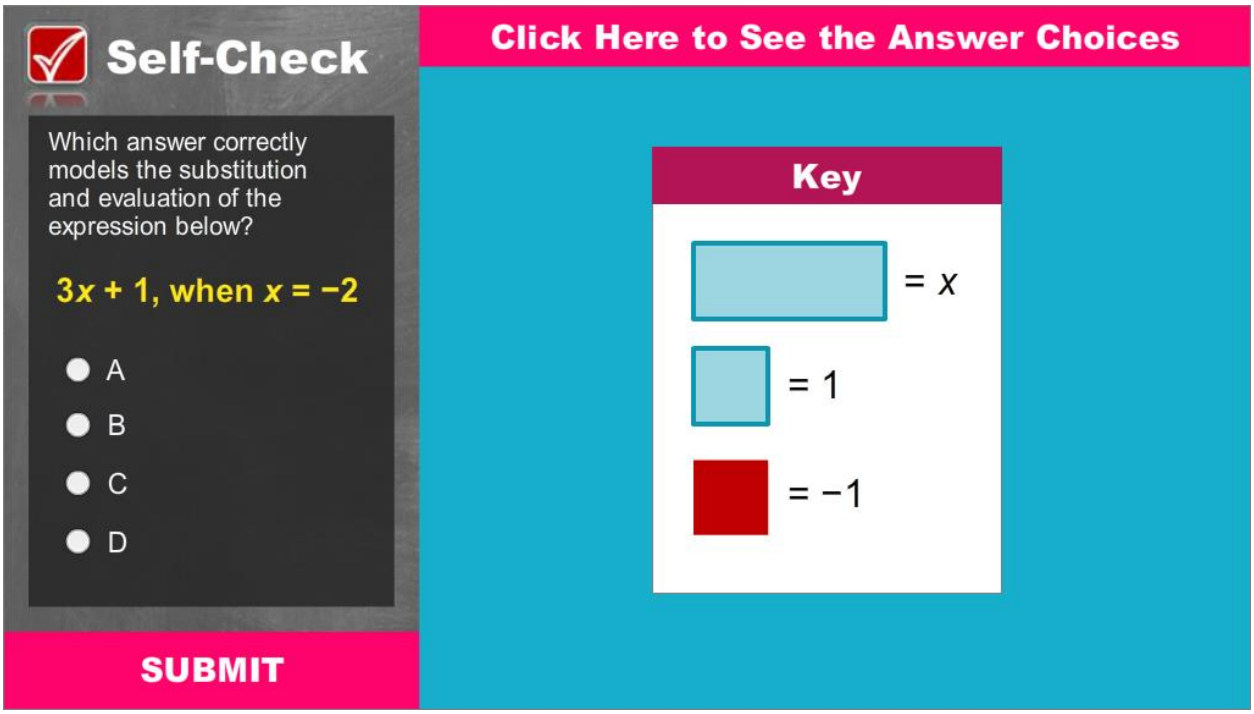
Click the number above that correctly completes the statement.

Example 2 (continued)



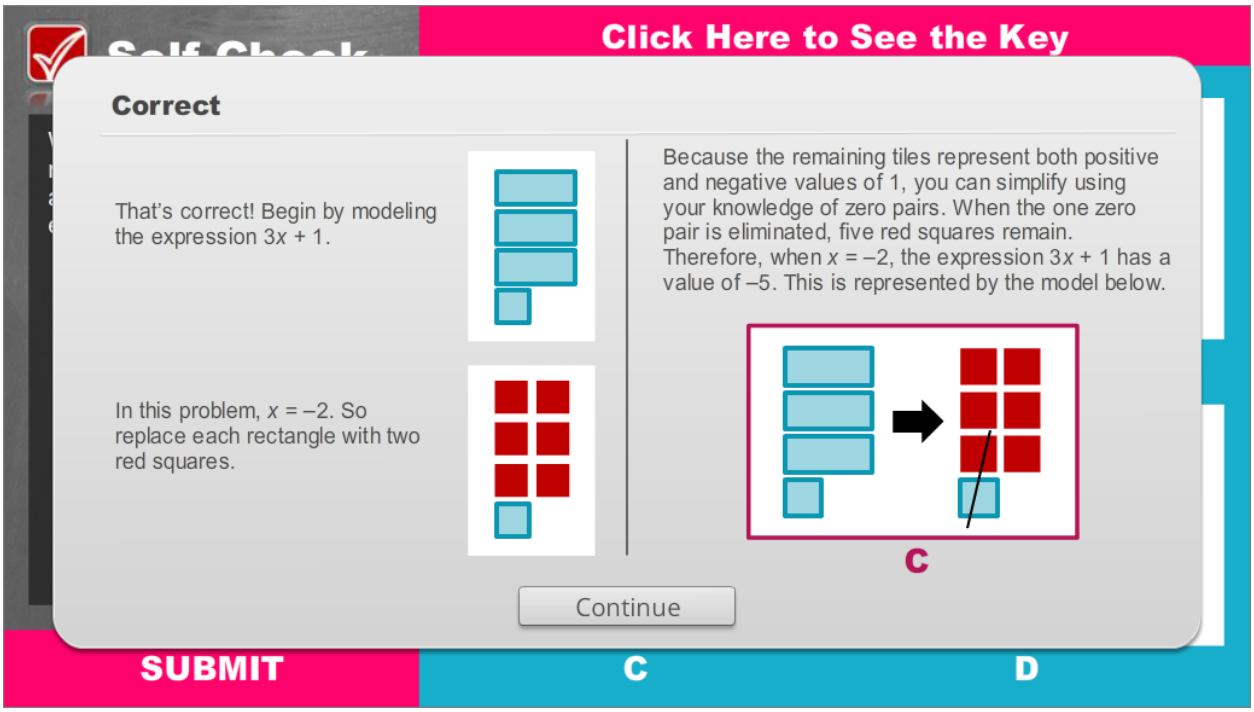
There are six tiles remaining and each has a value of 1. The final result is 6.

Self-Check



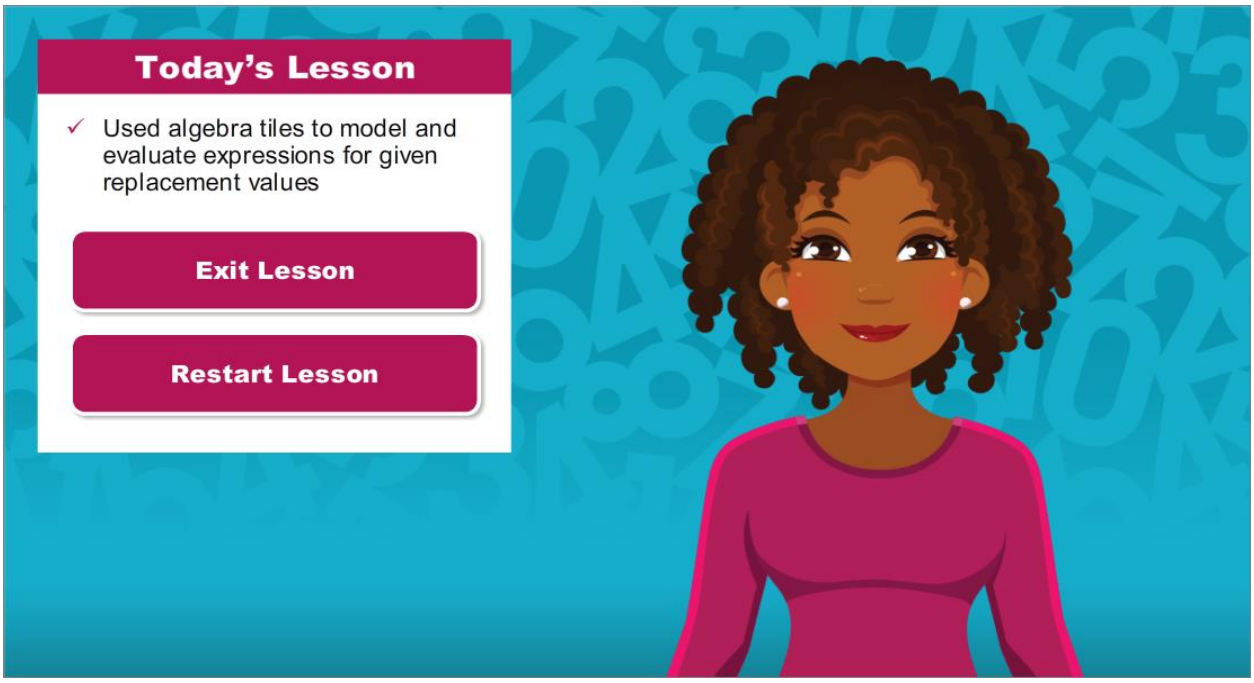
Solve the problem in the image above to check your understanding of the content.

Self-Check: Answer



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

Conclusion



Congratulations! You have reached the conclusion of this lesson in Algebra I. You are now well-skilled in how to use algebra tiles to model and evaluate algebraic expressions for given replacement values.