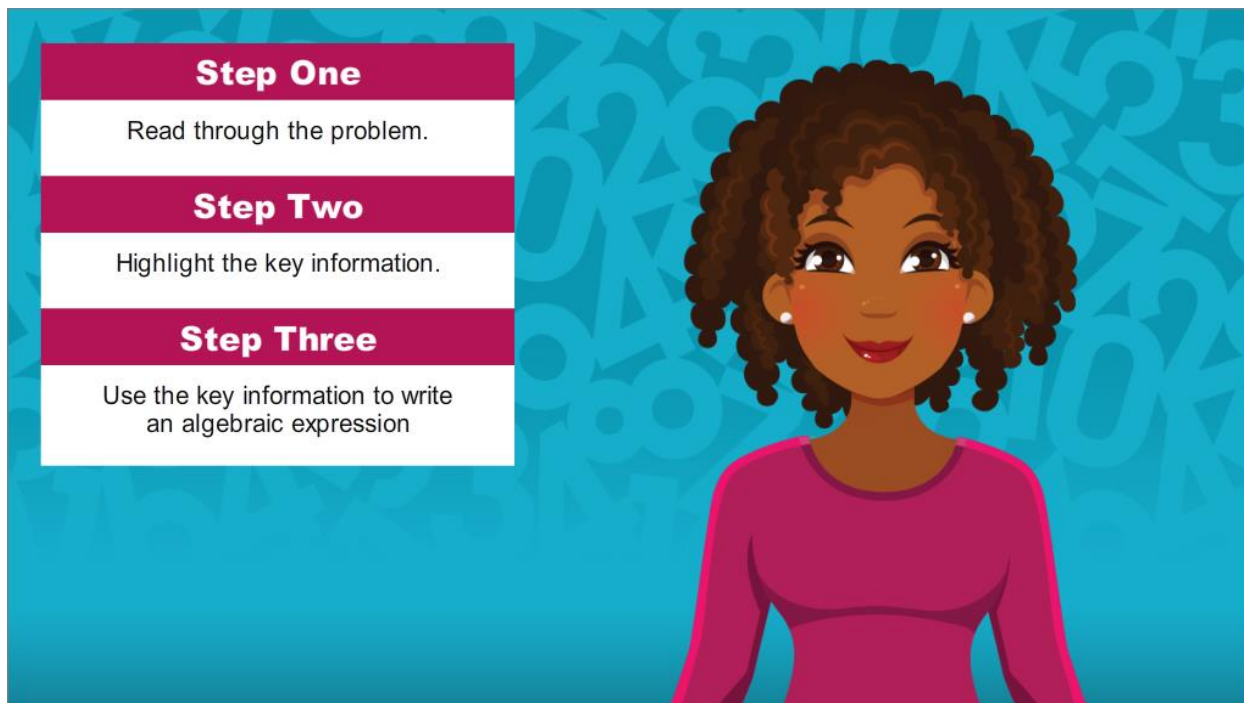


# Module 1: Expressions

## Topic 2: Modeling Real-World Situations

### Introduction



I'm so glad you could join me for this lesson in Algebra I, where you will learn how to use algebraic expressions to represent practical situations.

When writing an algebraic expression to represent a real-world situation, you are often presented with various pieces of information. Here are three steps that will help you interpret the facts you are given and allow you to write an algebraic expression to represent a practical situation.

Step 1: Read through the problem.

Step 2: Highlight the key information.

Step 3: Use the key information to write an algebraic expression.

Keep these steps in mind while you work through the following examples.

# Module 1: Expressions

## Topic 2: Modeling Real-World Situations

### Modeling Real-World Situations

**MODELING REAL-WORLD SITUATIONS**

**Click the Examples Below to Learn More**

Example One

Self-Check


Example Two

Click the examples below to learn more.

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 1



**Example 1**

Natasha volunteered to work in the ticket booth at her school's upcoming football game. Tickets are \$3 for each student and \$5 for each adult.

Let  $x$  represent the number of student tickets sold and  $y$  represent the number of adult tickets sold.

Write an expression to represent the amount of money Natasha will collect from ticket sales.

**Read through the problem above.  
Click to highlight important information.**

**Next**

Take a few moments to read Example 1. Highlight the information you think will help you write an algebraic expression.

*Natasha volunteered to work in the ticket booth at the upcoming school play. Tickets are \$3 for each student and \$5 for each adult.*

*Let  $x$  represent the number of student tickets sold and  $y$  represent the number of adult tickets sold.*

*Write an expression to represent the amount of money Natasha will collect from ticket sales.*

Read through the problem above. Click to highlight important information.

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 1 (continued)



#### Example 1

Natasha volunteered to work in the ticket booth at her school's upcoming football game. Tickets are \$3 for each student and \$5 for each adult.

Let  $x$  represent the number of student tickets sold and  $y$  represent the number of adult tickets sold.

Write an expression to represent the amount of money Natasha will collect from ticket sales.

Did you highlight these important facts?

- Tickets are \$3 for each student and \$5 for each adult
- $x$  represents the number of student tickets sold
- $y$  represents the number of adult tickets sold
- Write an expression to represent the amount of money collected from ticket sales

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 1 (continued)

	Example 1
<p><b>\$3</b> cost of each student ticket</p> <p><b><math>x</math></b> number of student tickets sold</p> <p><b>\$5</b> cost of each adult ticket</p> <p><b><math>y</math></b> number of adult tickets sold</p> <p><b><math>3x + 5y</math></b></p>	<p>Natasha volunteered to work in the ticket booth at her school's upcoming football game. Tickets are \$3 for each student and \$5 for each adult.</p> <p>Let <math>x</math> represent the number of student tickets sold and <math>y</math> represent the number of adult tickets sold.</p> <p>Write an expression to represent the amount of money Natasha will collect from ticket sales.</p> <p><a href="#">Return to Menu</a></p>

In the given scenario, student tickets are \$3 each. Because  $x$  represents the number of student tickets sold, this part of the situation can be represented by:  $3x$ .


You also know that adult tickets are \$5 each. Because  $y$  represents the number of adult tickets sold, this part of the situation can be represented by:  $5y$ .

Finally, you must write an expression that represents the total amount of money that Natasha will collect from the ticket sales. This total will include the money collected from student ticket sales,  $3x$ , plus the money collected from adult ticket sales,  $5y$ . Therefore, the expression " $3x + 5y$ " represents the total amount of money collected from the ticket sales.

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2



**Example 2**

In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.

Let  $x$  represent the number of wins,  $y$  represent the number of ties, and  $z$  represent the number of losses.

Write an expression to represent the total number of points a team earns when calculating its rank.

**Read through the problem above. Click to highlight important information.**

**Next**

Now take a few moments to read Example 2. Highlight the information you think will help you write an algebraic expression.

*In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.*

*Let  $x$  represent the number of wins,  $y$  represent the number of ties, and  $z$  represent the number of losses.*

*Write an expression to represent the total number of points a team earns when calculating its rank.*

Read through the problem above. Click to highlight important information.

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2 (continued)



#### Example 2

In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.

Let  $x$  represent the number of wins,  $y$  represent the number of ties, and  $z$  represent the number of losses.

Write an expression to represent the total number of points a team earns when calculating its rank.

Did you highlight these important facts?

- A team earns six points for each win, four points for each tie, and loses two points for each loss
- $x$  represents the number of wins
- $y$  represents the number of ties
- $z$  represents the number of losses
- Write an expression to represent the total number of points a team earns

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2 (continued)

Example 2	
<p><math>x</math> the number of wins</p> <p><math>y</math> the number of ties</p> <p><math>z</math> the number of losses</p> <p><input type="text"/> <math>x</math></p>	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p> <p><b>Enter the correct value into the expression on the left, then click submit.</b></p> <p><b>Submit</b></p>

In this scenario, there are three variables to consider: the number of wins,  $x$ ; the number of ties,  $y$ ; and the number of losses,  $z$ .

A team earns six points for each win. Because  $x$  represents the number of wins, this part of the situation can be represented by:  $6x$ .

Enter the correct value into the expression on the left, then click submit.



## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2 (continued)

Example 2	
<p><b><math>x</math></b> the number of wins</p> <p><b><math>y</math></b> the number of ties</p> <p><b><math>z</math></b> the number of losses</p> <p><math>6x + \square y</math></p>	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p> <p><b>Enter the correct value into the expression on the left, then click submit.</b></p> <p><b>Submit</b></p>

Feedback: A team earns six points for each win. If  $x$  represents the number of wins, then this part of the situation can be represented by:  $6x$ .

**Module 1: Expressions**  
**Topic 2: Modeling Real-World Situations**

**Example 2 (continued)**

<b>Example 2</b>	
$x$ the number of wins $y$ the number of ties $z$ the number of losses  $6x + \square y$	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p> <p style="text-align: center; color: #00838f;"><b>Enter the correct value into the expression on the left, then click submit.</b></p> <div style="text-align: center; margin-top: 10px;"><span style="background-color: #800040; color: white; padding: 5px 20px; border-radius: 10px; display: inline-block;">Submit</span></div>

A team earns four points for each tie. Because  $y$  represents the number of ties, this part of the situation can be represented by:  $?y$ .

Enter the correct value into the expression on the left, then click submit.

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2 (continued)

	Example 2
<p><b>x</b> the number of wins</p> <p><b>y</b> the number of ties</p> <p><b>z</b> the number of losses</p> <p>A team earns four points for each tie. If <math>y</math> represents the number of ties, then this part of the expression can be represented by <math>4y</math>.</p> <p><math>6x + 4y</math></p>	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p> <p><a href="#">Next</a></p>

Feedback: A team earns four points for each tie. If  $y$  represents the number of ties, then this part of the situation can be represented by:  $4y$ .

**Module 1: Expressions**  
**Topic 2: Modeling Real-World Situations**

**Example 2 (continued)**

	<b>Example 2</b>
<p><math>x</math> the number of wins</p> <p><math>y</math> the number of ties</p> <p><math>z</math> the number of losses</p>  $6x + 4y$	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p> <p><b>If <math>z</math> represents the number of losses, which of the following represents this part of the expression?</b></p> <p><input type="radio"/> <math>2z</math>      <input type="radio"/> <math>-2z</math>      <input type="radio"/> <math>-2</math></p>

If  $z$  represents the number of losses, which of the following represents this part of the expression?

- A)  $2z$
- B)  $-2z$
- C)  $-2$

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2 (continued)

	Example 2
<p><b>x</b> the number of wins</p> <p><b>y</b> the number of ties</p> <p><b>z</b> the number of losses</p> <p>A loss results in a team losing two points, therefore, a loss is represented by a negative number. This part of the expression can be represented by <math>-2z</math>.</p> <p><math>6x + 4y - 2z</math></p>	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p> <p><a href="#">Next</a></p>

Feedback: A loss results in a team losing two points, therefore, a loss is represented by a negative number. This part of the expression can be represented by:  $-2z$

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Example 2 (continued)

	Example 2
<p><math>x</math> the number of wins</p> <p><math>y</math> the number of ties</p> <p><math>z</math> the number of losses</p> <p><math>6x + 4y - 2z</math></p> <p><b>wins</b>      <b>ties</b>      <b>losses</b></p>	<p>In a soccer league, teams are ranked using points. A team earns six points for each win, four points for each tie, and loses two points for each loss.</p> <p>Let <math>x</math> represent the number of wins, <math>y</math> represent the number of ties, and <math>z</math> represent the number of losses.</p> <p>Write an expression to represent the total number of points a team earns when calculating its rank.</p>

Now you know that  $6x$  represents the total number of points earned from a team's wins,  $4y$  represents the total number of points earned from ties, and  $-2z$  represents the total number of points lost.

The total number of points a team earns when calculating its rank can be represented by the expression:  $6x + 4y - 2z$

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**Topic 2: Modeling Real-World Situations**

**Self-Check**



**Self-Check**

During the summer months, a local bakery sells cups of lemonade for \$2 each, cupcakes for \$1 each, and brownies for \$3 each.

Let  $x$  represent the number of cups of lemonade sold,  $y$  represent the number of cupcakes sold, and  $z$  represent the number of brownies sold.

Which of the following expressions correctly represents the total amount of bakery sales?

- $x + 2y + 3z$
- $3x + y + 2z$
- $2x + y + 3z$

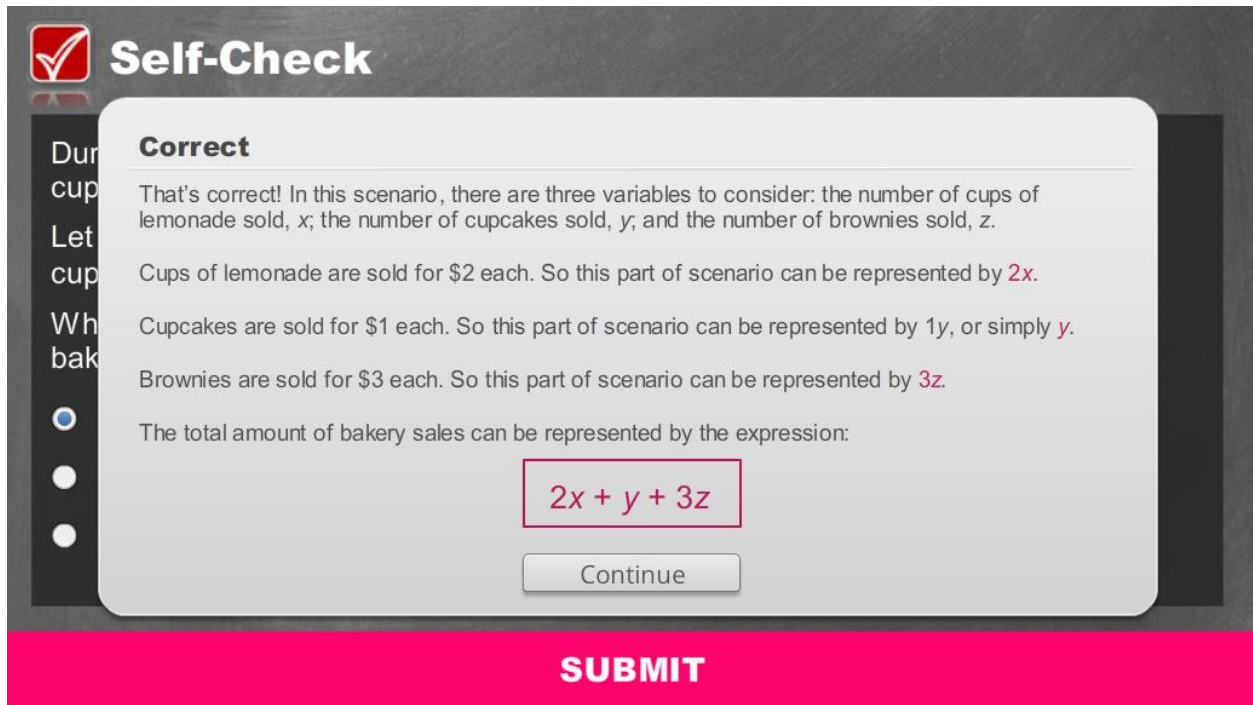
**SUBMIT**

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

## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Self-Check: Answer



**Self-Check**

**Correct**

That's correct! In this scenario, there are three variables to consider: the number of cups of lemonade sold,  $x$ ; the number of cupcakes sold,  $y$ ; and the number of brownies sold,  $z$ .

Cups of lemonade are sold for \$2 each. So this part of scenario can be represented by  $2x$ .

Cupcakes are sold for \$1 each. So this part of scenario can be represented by  $1y$ , or simply  $y$ .

Brownies are sold for \$3 each. So this part of scenario can be represented by  $3z$ .

The total amount of bakery sales can be represented by the expression:

$2x + y + 3z$

Continue

**SUBMIT**

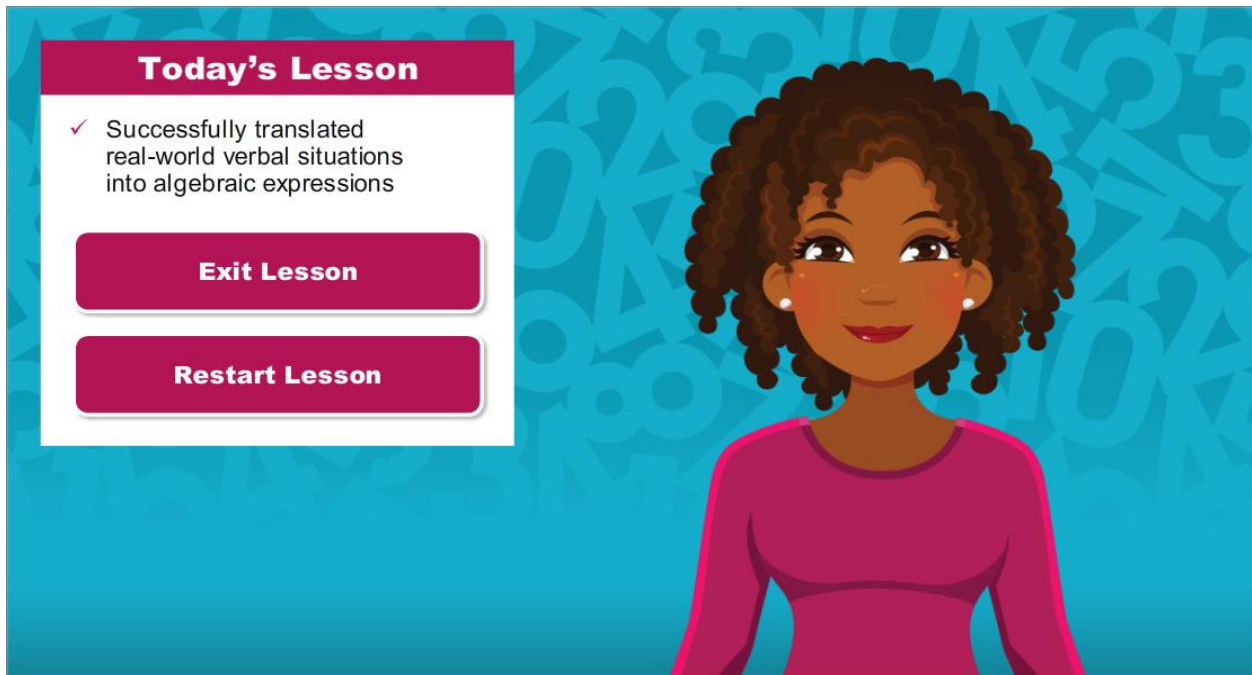
For your reference, the image above shows the correct solution to the self-check problem.



## Module 1: Expressions

### Topic 2: Modeling Real-World Situations

#### Conclusion

A digital interface for a lesson conclusion. On the left, a white box with a pink header titled "Today's Lesson" contains a checkmark and the text "Successfully translated real-world verbal situations into algebraic expressions". Below this are two pink buttons: "Exit Lesson" and "Restart Lesson". On the right, a cartoon illustration of a young woman with dark curly hair and a pink top is shown against a blue background with faint mathematical symbols like pi, infinity, and numbers.

Congratulations! You have reached the conclusion of this lesson. You were able to apply your knowledge of how to translate a verbal situation to an algebraic expression and are now well-equipped to use algebraic expressions to represent practical situations.