

Math: Grade 6, Lesson 3, Using Distributive Property

Lesson Focus: Using the distributive property to write equivalent expressions

Practice Focus: Students model and write equivalent expressions using the distributive property. They move from the factored form to the expanded form of an expression.

Objective: Students will use the distributive property to write equivalent expressions moving from factored form to expanded form.

Key Vocabulary: expression, distributive property, factored form, equivalent

TN Standard: 6.EE.A.3

Teacher Materials:

- White board and markers

Student Materials:

- Paper and pencil

| Teacher Do | Student Do |
|--|---|
| <p>Opening (1 minute)</p> <p>Hello! Welcome to Tennessee's At Home Learning Series for math! Today's lesson is for all our 6th graders out there, though all children are welcome to tune in. This lesson is the 3rd in our series.</p> <p>My name is ____ and I'm a ____ grade teacher in Tennessee schools! I'm so excited to be your teacher for this lesson! Welcome to my virtual classroom!</p> <p>If you didn't see our previous lesson, you can find it on http://www.tn.gov/education. You can still tune in to today's lesson if you haven't see any of our others. But, it might be more fun if you first go back and watch our other lessons since we'll be talking about things we learned previously.</p> <p>Today we will be learning about using the distributive property to write equivalent expressions in mathematics! Before we get started, to participate fully in our lesson today, you will need:</p> <ul style="list-style-type: none"> • Paper and pencil <p>Ok, let's begin!</p> | <p>Students get materials ready for the lesson.</p> |
| <p>Intro (5 minutes)</p> <p>Students find a piece of paper or print the problems. We're going to work on applying the properties of operations to generate equivalent expressions. We'll start with a review to begin engaging our brains. What properties of operations have you worked with before? [Pause]</p> | <p>Students respond</p> |

You're right. Commutative, Associative, and Distributive.
Today we're going to focus on using the distributive property to show equivalent expressions. Let's start with creating a model. [After giving students a minute, encourage students to use a tape diagram.]

Create a model for 2×5



Create a model for $2 \times b$ or $2b$



You have been creating models for expressions for several years. Today we're doing to use models to show equivalent expressions.

Student draws a model.

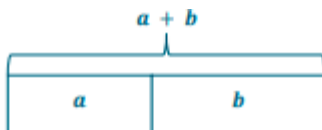
Teacher Model (10 minutes)

Read the problem - Write an expression that is equivalent to $2(a + b)$. [Pause]

In this example, we have been given the factored form of the expression.

To answer this question, we can create a model to represent $2(a + b)$.

Let's start by creating a model to represent $(a + b)$.



The expression $2(a + b)$ tells us that we have 2 of the $(a + b)$'s.
Create a model that shows 2 groups of $(a + b)$'s. [Pause]



How many a's and how many b's do you see in the diagram?
 [Pause]

Students respond

Great work! There are 2 a's and 2 b's.

How would the model look if we grouped together a's and then grouped together the b's? [Student and teacher draw a grouped model.]



What expression could we write to represent the new diagram? [Pause]

$2a + 2b$

What conclusion can we draw from the models about the expressions? [Pause]

$2(a + b) = 2a + 2b$

Yes, they are equivalent expressions.

Let's prove that these two forms are equivalent. We'll substitute some values for a and b and see what happens. What are some values you would like to substitute? (Pause)

Great idea! We'll let $a = 3$ and $b = 4$.

| | |
|------------|---------------|
| $2(a + b)$ | $2a + 2b$ |
| $2(3 + 4)$ | $2(3) + 2(4)$ |
| $2(7)$ | $6 + 8$ |
| 14 | 14 |

How do we know they are equivalent? (Pause)

When we substituted both of the expressions equal 14.

Let's look at another problem.

Write an expression that is equivalent to double $(3x + 4y)$.
[Pause]

What does it mean to double? [Pause for students to respond]

Yes! Double means to multiply by 2.

Awesome! Doubling means to multiply by 2. So what is it really asking is for us to find an expression that is equivalent to $2(3x + 4y)$.

Let's draw a model to represent $2(3x + 4y)$ [Pause]
First, let's draw $3x + 4y$.



Now, let's double it.



Are there any terms we can combine? [Pause]



Yes, you are correct. We have $6x + 8y$

Have you noticed a pattern of how we could simplify the expressions without drawing a model? What is the pattern? [Pause]

You're right, when there is a number outside the parentheses, I would multiply it by all the terms on the inside of the parentheses.

Why do you think you think we might not always want to draw a model? [Pause]

Yes, you are correct! It would take a long time to draw if we were multiplying by larger numbers, like 14. We want to know how to apply the distributive property.

Let's continue to test our theories with example 3.

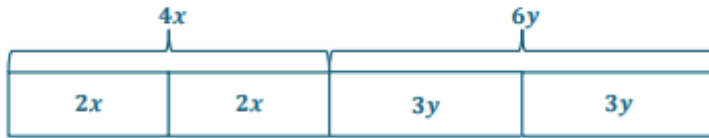
Draw a model for $2(2x + 3y)$. [Pause]



Let's combine terms. [Pause]

Student draws a model.

Student draws a model.



The result is $4x + 6y$.

Guided Practice (12-13 minutes)

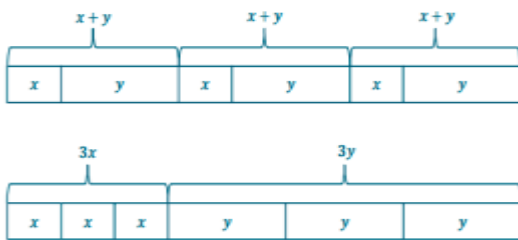
You are doing great with this lesson, so we are going to jump into you helping me!

For the following problems:

Create a model for each expression below. Then, write another equivalent expression using the distributive property.

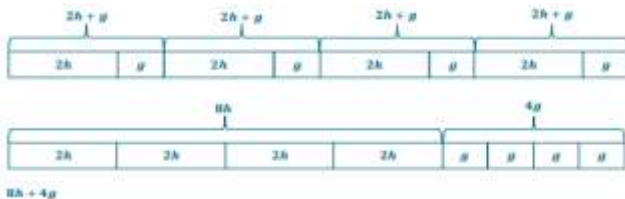
[Allow for the student to work the problems. Then discuss the answers.]

1. $3(x + y)$



I heard someone say they got $3x + 3y$. That is correct!

2. $4(2h + g)$



Yes! It is $8h + 4g$!

Apply the distributive property to write equivalent expressions in expanded form. You may draw a model if needed.

1. $8(h + 3)$ $8h + 24$
2. $3(2y + 7)$ $6y + 21$
3. $4(11n + 3m)$ $44n + 12m$

Students respond alongside teacher

| | |
|--|--|
| <u>Independent Practice</u> Great work! Today, we reviewed ways to use distributive property to write equivalent expressions. I hope you're seeing the significance of using our properties to expand expressions! You sure did a great job! After the video, you will have some problems to practice on your own. Good luck and do your best! | |
| <u>Closing (1 min)</u> <ul style="list-style-type: none">Boys and Girls, I enjoyed writing equivalent expressions using the distributive property with you today! Thank you for inviting me into your home. I look forward to seeing you in our next lesson in Tennessee's At Home Learning Series!Bye! | |

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