

**LEARNING OBJECTIVE:** We will apply the distributive property to create equivalent expressions. (G7M3L4)

**CONCEPT DEVELOPMENT:**

**The Distributive Property** allows you to rewrite **specific expressions involving multiplication and addition/subtraction** without changing the value of the expression.

Examples:

Non-Examples:

8 times the quantity of x plus 5  
 ←  $8(x + 5) = (8 \cdot x) + (8 \cdot 5) = 8x + 40$   
 Parentheses

$3(2x - 5) = (3 \cdot 2x) - (3 \cdot 5) = 6x - 15$

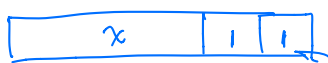
$8(x + 5) = 8x + 5$

$3 \cdot 2x = 6x$   
 $-5$

**Using an Array Model to Show the Distributive Property**

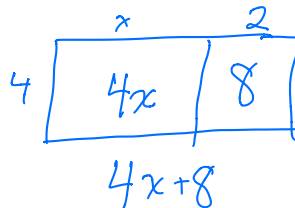
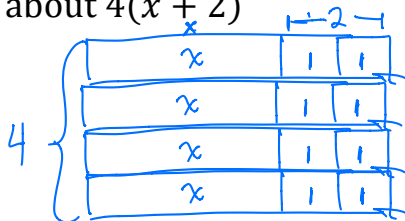
VISUAL MODEL!!

How can we use a tape diagram to represent  $x + 2$ ?



Area = l x w

What about  $4(x + 2)$ ?

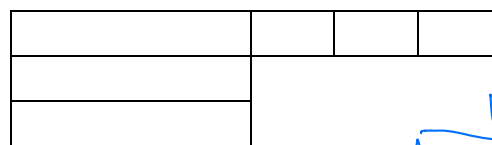
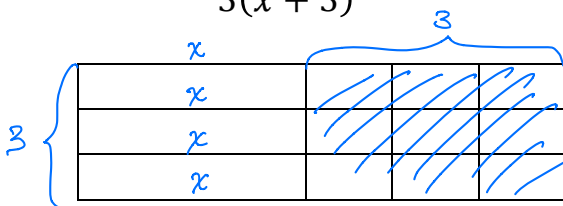


Example:

$3(x + 3)$

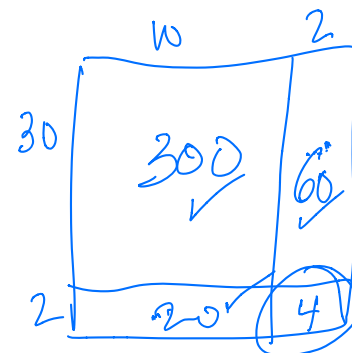
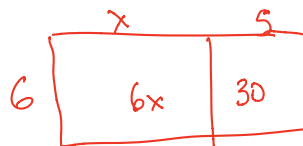
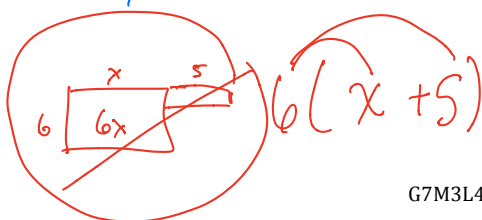
Non-Example:

$3(x + 3)$



$3x + 9$

$3x + 3$



**GUIDED PRACTICE:****Steps for Using the Distributive Property to Create Equivalent Expressions**

1. Rewrite the problem by distributing (multiplying) the term outside of the parentheses to each of the terms inside the parentheses.
2. Simplify your Expression.

$3(x - 11)$ $(3 \cdot x) - (3 \cdot 11)$ $3x - 33$ $\cancel{3(x-11)}$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;"><math>x</math></td> <td style="padding: 2px;"><math>-11</math></td> </tr> <tr> <td style="padding: 2px;"><math>3x</math></td> <td style="padding: 2px;"><math>-33</math></td> </tr> </table> $3x - 33$	$x$	$-11$	$3x$	$-33$	$6(x + 12)$ $(6 \cdot x) + (6 \cdot 12)$ $6x + 72$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;"><math>x</math></td> <td style="padding: 2px;"><math>12</math></td> </tr> <tr> <td style="padding: 2px;"><math>6x</math></td> <td style="padding: 2px;"><math>72</math></td> </tr> </table> $6x + 72$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 2px;"><math>x</math></td> <td style="padding: 2px;"><math>10</math></td> <td style="padding: 2px;"><math>2</math></td> </tr> <tr> <td style="padding: 2px;"><math>6x</math></td> <td style="padding: 2px;"><math>60</math></td> <td style="padding: 2px;"><math>12</math></td> </tr> </table> $6x + 72$	$x$	$12$	$6x$	$72$	$x$	$10$	$2$	$6x$	$60$	$12$
$x$	$-11$														
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$x$	$10$	$2$													
$6x$	$60$	$12$													
$-4(x + y)$ $(-4 \cdot x) + (-4 \cdot y)$ $-4x + (-4y)$ $-4x - 4y$	$-2(x + 8)$ $(-2 \cdot x) + (-2 \cdot 8)$ $-2x + (-16)$ $-2x - 16$														
$a(4b + c)$ $(a \cdot 4b) + (a \cdot c)$ $4ab + ac$ $3a + 2b \neq 5ab$ $3a \cdot 2b = 6ab$	$x(3y + 7)$ $(x \cdot 3y) + (x \cdot 7)$ $3xy + 7x$ <del><math display="block">3xy + 7x</math></del>														
$3(4x - 2y + z)$ $(3 \cdot 4x) - (3 \cdot 2y) + (3 \cdot z)$ $12x - 6y + 3z$	$5(3a + 2b - c)$ $(5 \cdot 3a) + (5 \cdot 2b) - (5 \cdot c)$ $15a + 10b - 5c$														

**Steps for Using the Distributive Property to Create Equivalent Expressions**

1. Rewrite the problem by distributing (multiplying) the term outside of the parentheses to each of the terms inside the parentheses.
2. Simplify your Expression.

$5(3x + y) + 3(2x - 5y)$ $\rightarrow (5 \cdot 3x) + (5 \cdot y) + (3 \cdot 2x) - (3 \cdot 5y)$ $15x + 5y + 6x - 15y$ $\rightarrow \underline{15x} + \underline{5y} + \underline{6x} + \underline{(-15y)}$ $(15x + 6x) + (5y + (-15y))$ $21x + (-10y)$ $\boxed{21x - 10y}$	$4(2 + 4r) + 7(1 - 2r) \quad *$ $(4 \cdot 2) + (4 \cdot 4r) + (7 \cdot 1) - (7 \cdot 2r)$ $8 + 16r + 7 - 14r$ $\underline{8} + \underline{16r} + \underline{7} + \underline{(-14r)}$ $(16r + (-14r)) + (8 + 7)$ $\boxed{2r + 15}$												
<p>**rewrite as multiplication!</p> $(6y + 8) \div 2 \quad \frac{1}{2}x$	$(9g + 15) \div 3 \quad \frac{1}{3}x$												
<p>Write two equivalent expressions for the following array.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;"><math>4x</math></td> <td style="text-align: center;"><math>6</math></td> </tr> <tr> <td style="text-align: center;"><math>3</math></td> <td style="text-align: center;"><math>12x</math></td> <td style="text-align: center;"><math>18</math></td> </tr> </table> <p>① <math>3(4x + 6)</math></p> <p>② <math>12x + 18</math></p>		$4x$	$6$	$3$	$12x$	$18$	<p>Write two equivalent expressions for the following array.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td style="text-align: center;"><math>2x</math></td> <td style="text-align: center;"><math>3</math></td> </tr> <tr> <td style="text-align: center;"><math>5</math></td> <td style="text-align: center;"><math>10x</math></td> <td style="text-align: center;"><math>15</math></td> </tr> </table> <p>① <math>5(2x + 3)</math></p> <p>② <math>10x + 15</math></p>		$2x$	$3$	$5$	$10x$	$15$
	$4x$	$6$											
$3$	$12x$	$18$											
	$2x$	$3$											
$5$	$10x$	$15$											

NAME: \_\_\_\_\_

Math 7.1

Mr. Rogove

Date: \_\_\_\_\_

**INDEPENDENT PRACTICE:**

**Steps for Using the Distributive Property to Create Equivalent Expressions**

1. Rewrite the problem by distributing (multiplying) the term outside of the parentheses to each of the terms inside the parentheses.
2. Simplify your Expression.

$3(x + 5) + 5(2x - 1)$	$4(x + 3y)$
$(-18x + 15y) \div 3$	$6(2a - 3b + 6c)$
$-3(3x - 4y) + 2(12x + 4y)$	$5(2x + 3y) + 2(4x - 3y)$

NAME: \_\_\_\_\_

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**ACTIVATING PRIOR KNOWLEDGE:**

We can combine like terms that involve subtraction and parentheses.

$5t + 3v - (2t - 3v)$	$3x + 12y - (8y - 14x)$
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**CLOSURE:**

Border Problem can be closure?

**TEACHER NOTES:**

This maps to lesson 3, module 3

Do the border problem from Boaler—kids make up different expressions. (10-15 minutes)

HW: Problem Set from Lesson 3