2.5 Apply the Distributive Property

TEKS A.4.B, A.1.C

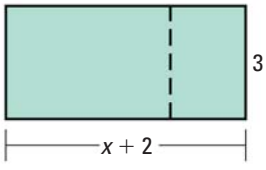
Before You used properties to add and multiply real numbers.

Now You will apply the distributive property.

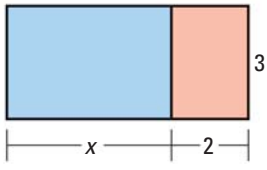
Why? So you can find calories burned, as in Example 5.

Key Vocabulary
- **equivalent expressions**
- **distributive property**
- **term**
- **coefficient**
- **constant term**
- **like terms**

The models below show two methods for finding the area of a rectangle that has a length of $(x + 2)$ units and a width of 3 units.



Area = 3(x + 2)



Area = 3(x) + 3(2)

The expressions $3(x + 2)$ and $3(x) + 3(2)$ are equivalent because they represent the same area. Two expressions that have the same value for all values of the variable are called **equivalent expressions**. The equation $3(x + 2) = 3(x) + 3(2)$ illustrates the **distributive property**, which can be used to find the product of a number and a sum or difference.

KEY CONCEPT *For Your Notebook*

The Distributive Property

Let a, b, and c be real numbers.

Words	Algebra	Examples
The product of a and $(b + c)$:	$a(b + c) = ab + ac$	$3(4 + 2) = 3(4) + 3(2)$
	$(b + c)a = ba + ca$	$(3 + 5)2 = 3(2) + 5(2)$
The product of a and $(b - c)$:	$a(b - c) = ab - ac$	$5(6 - 4) = 5(6) - 5(4)$
	$(b - c)a = ba - ca$	$(8 - 6)4 = 8(4) - 6(4)$

EXAMPLE 1 Apply the distributive property

AVOID ERRORS
Be sure to distribute the factor outside of the parentheses to *all* of the numbers inside the parentheses, not just to the first number.

Use the distributive property to write an equivalent expression.

a. $4(y + 3) = 4y + 12$

b. $(y + 7)y = y^2 + 7y$

c. $n(n - 9) = n^2 - 9n$

d. $(2 - n)8 = 16 - 8n$