



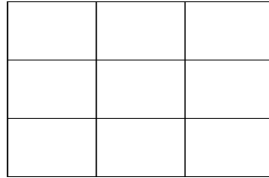
## Lesson 7: Replacing Letters with Numbers

### Student Outcomes

- Students understand that a letter represents one number in an expression. When that number replaces the letter, the expression can be evaluated to one number.

### Classwork

#### Example 1



What is the length of one side of this square?

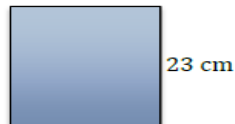
What is the formula for the area of a square?

What is the square's area as a multiplication expression?

What is the square's area?

Feb 7-7:01 AM

We can count the units. However, look at this other square. Its side length is 23 cm. That is just too many tiny units to draw. What expression can we build to find this square's area?

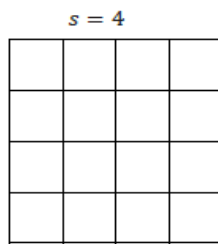


What is the area of the square? Use a calculator if you need to.

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**Exercise 1**

Complete the table below for both squares. Note: These drawings are not to scale.



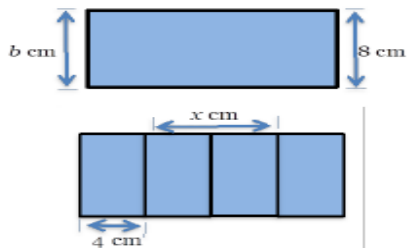
$s = 25$  in.



Length of One Side of the Square	Square's Area Written as an Expression	Square's Area Written as a Number

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**Example 2**



What does the letter  $b$  represent in this blue rectangle?

With a partner, answer the following question: Given that the second rectangle is divided into four equal parts, what number does the  $x$  represent?

How did you arrive at this answer?

What is the total length of the second rectangle? Tell a partner how you know.

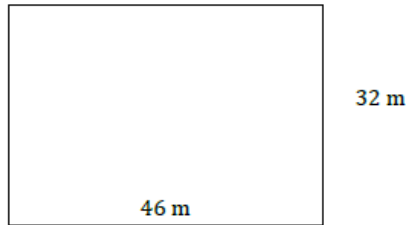
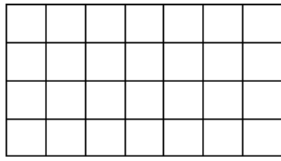
If the two large rectangles have equal lengths and widths, find the area of each rectangle.

Discuss with your partner how the formulas for the area of squares and rectangles can be used to evaluate area for a particular figure.

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**Exercise 2**

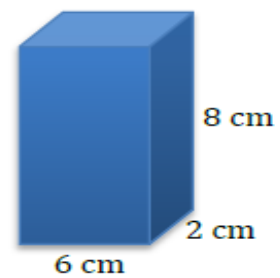
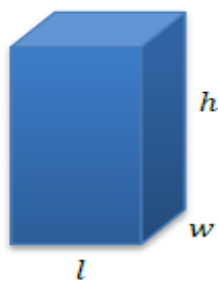
Complete the table below for both rectangles. Note: These drawings are not to scale. Using a calculator is appropriate.



Length of Rectangle	Width of Rectangle	Rectangle's Area Written as an Expression	Rectangle's Area Written as a Number

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**Example 3**



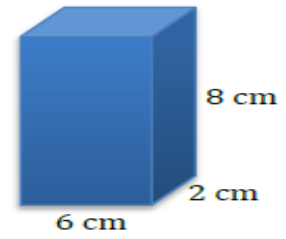
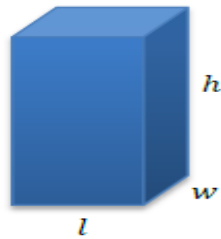
What does the  $l$  represent in the first diagram?

What does the  $w$  represent in the first diagram?

What does the  $h$  represent in the first diagram?

Feb 10-6:29 AM

**Example 3**



Since we know the formula to find the volume is  $V = l \times w \times h$ , what number can we substitute for the  $l$  in the formula? Why?

What other number can we substitute for the  $l$ ?

What number can we substitute for the  $w$  in the formula? Why?

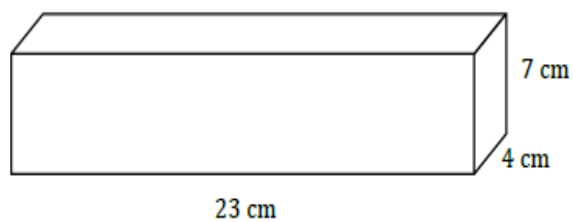
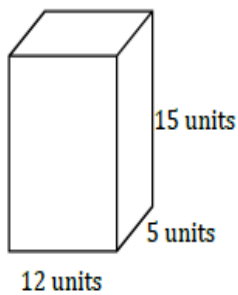
What number can substitute for the  $h$  in the formula?

Determine the volume of the second right rectangular prism by substituting the letters in the formula with their appropriate numbers.

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**Exercise 3**

Complete the table for both figures. Using a calculator is appropriate.



Length of Rectangular Prism	Width of Rectangular Prism	Height of Rectangular Prism	Rectangular Prism's Volume Written as an Expression	Rectangular Prism's Volume Written as a Number

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**Lesson Summary**

**Expression:** An *expression* is a numerical expression, or it is the result of replacing some (or all) of the numbers in a numerical expression with variables

There are two ways to build expressions:

1. We can start out with a numerical expression, like  $\frac{1}{3} \cdot (2 + 4) + 7$ , and replace some of the numbers with letters to get  $\frac{1}{3} \cdot (x + y) + z$ .
2. We can build such expressions from scratch, as in  $x + x(y - z)$ , and note that if numbers were placed in the expression for the variables  $x$ ,  $y$ , and  $z$ , the result would be a numerical expression.

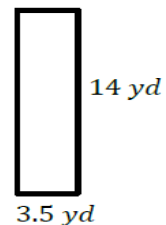
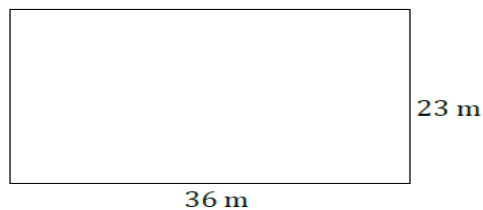
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**Problem Set**

1. Replace the side length of this square with 4 in. and find the area.



2. Complete the table for each of the given figures.



Feb 12-6:17 AM

Length of Rectangle	Width of Rectangle	Rectangle's Area Written as an Expression	Rectangle's Area as a Number

- Find the perimeter of each quadrilateral in Problems 1 and 2.
- Using the formula  $V = l \times w \times h$ , find the volume of a right rectangular prism when the length of the prism is 45 cm, the width is 12 cm, and the height is 10 cm.

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**Exit Ticket**

- Evaluate this expression:  $39 \div (2 + 1) - 2 \times (4 + 1)$
- Evaluate this expression:  $12 \times (3 + 2^2) \div 2 - 10$
- Evaluate this expression:  $12 \times (3 + 2)^2 \div 2 - 10$

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