

Grades 6–9

# ALGEBRA LAB GEAR

## — Basic Algebra —

■ Integer Arithmetic    ■ Equivalent Expressions    ■ Perimeter and Surface Area  
■ The Distributive Property    ■ Equivalent Equations

# BA

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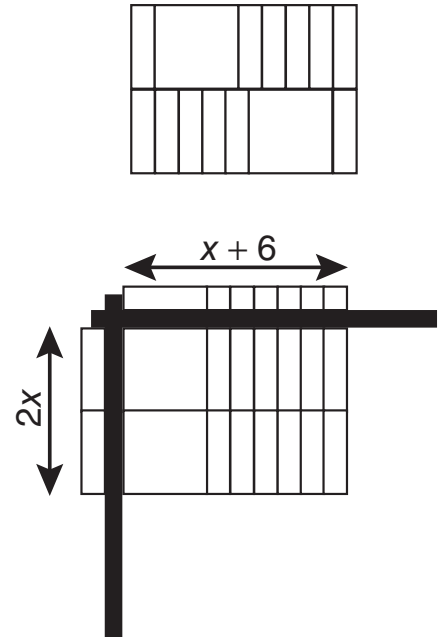
## CHALLENGE 6

### Make a Rectangle

Sometimes a group of blocks can be arranged into a rectangle.

For example, you can rearrange the blocks  $2x^2 + 12x$  into a rectangle like this.

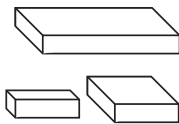
This rectangle has a length of  $x + 6$  and a width of  $2x$ , which can be seen better if you organize the blocks logically and use the corner piece, as shown. (Notice that you could also turn the rectangle so that the length and width are exchanged. This is considered to be the same rectangle.)



For a rectangle, length times width = area. For this rectangle,  $(x + 6) \cdot 2x = 2x^2 + 12x$ .

For each problem, arrange the given blocks into a rectangle. Sketch the rectangle and write the length, width, and area.

1.

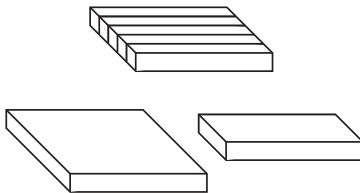


Length \_\_\_\_\_

Width \_\_\_\_\_

Area \_\_\_\_\_

2.

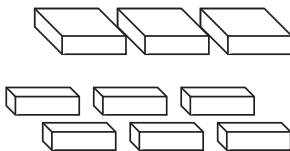


Length \_\_\_\_\_

Width \_\_\_\_\_

Area \_\_\_\_\_

3.



Length \_\_\_\_\_

Width \_\_\_\_\_

Area \_\_\_\_\_

Find another way.

Length \_\_\_\_\_

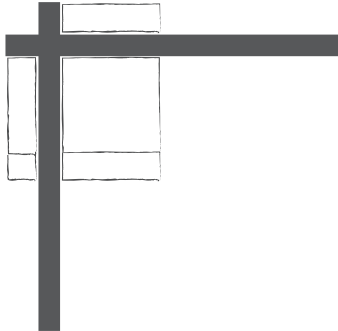
Width \_\_\_\_\_

Area \_\_\_\_\_

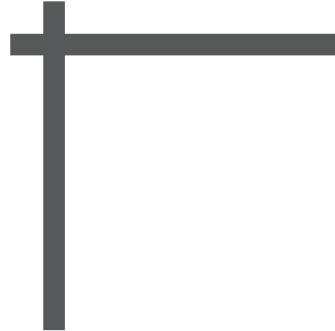
## Multiplication with Variables

Use the corner piece and blocks to show each multiplication. Sketch the blocks. Write the product.

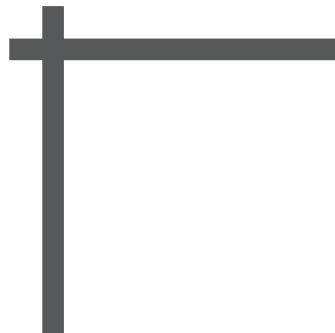
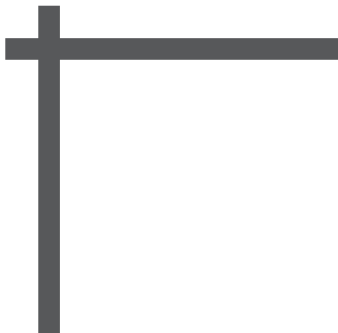
1.  $(x + 1)x = \underline{x^2 + x}$



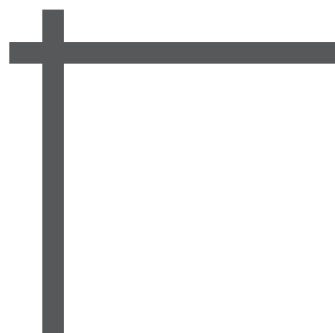
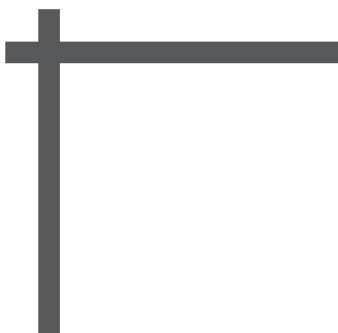
2.  $(x + 2)(x + 3) = \underline{\hspace{2cm}}$



3.  $(x + 5)(x + y) = \underline{\hspace{2cm}}$  4.  $2(y + 1) = \underline{\hspace{2cm}}$



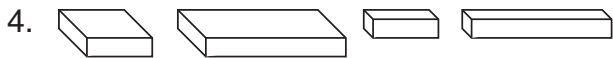
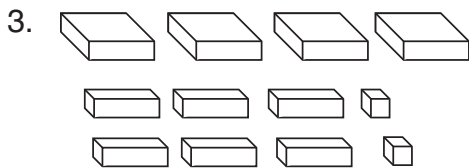
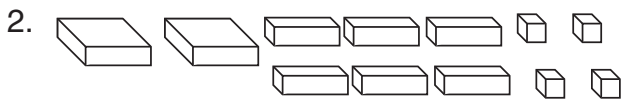
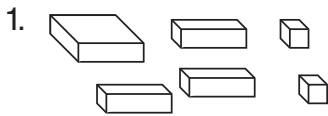
5.  $(y + 4)(y + 1) = \underline{\hspace{2cm}}$  6.  $(2x + 3)(x + y + 1) = \underline{\hspace{2cm}}$



# CHALLENGE 10

## Make a Rectangle

For each problem, arrange the given blocks into a rectangle or square. Sketch it and write a multiplication equation like this: length · width = area.

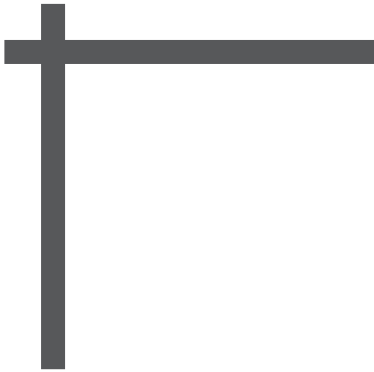


## CHALLENGE 13

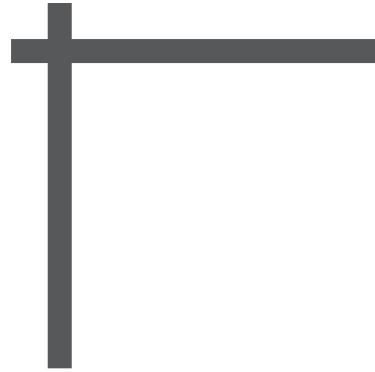
### Make a Rectangle

Take blocks to match each expression. Arrange them into a rectangle inside the corner piece and sketch your blocks. Write a multiplication equation like this:  
*length · width = area.*

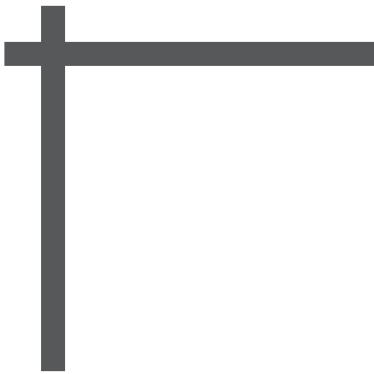
1.  $x^2 + 7x$



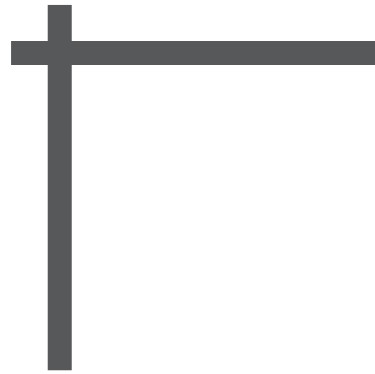
2.  $x^2 + 7x + 6$



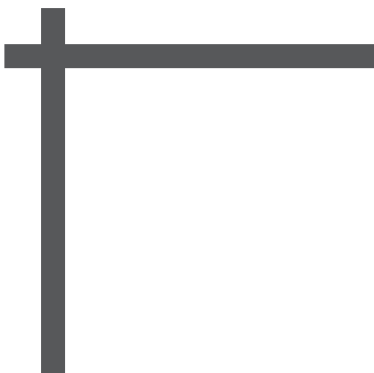
3.  $x^2 + 7x + 10$



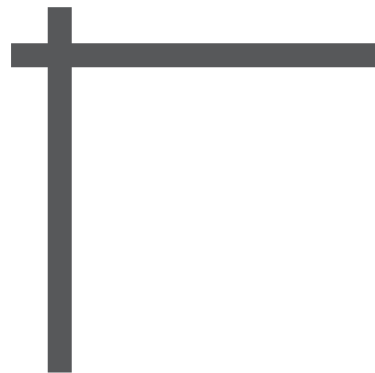
4.  $x^2 + 7x + 12$



5.  $x^2 + 8x + 12$



6.  $x^2 + 13x + 12$



## CHALLENGE 18

### Make a Square

To make a square with these blocks, add as many yellow blocks as you want, but nothing else. Sketch each square and write an equation like this: *length · width = area*.

1.  $x^2 + 10x +$  (yellow blocks)

2.  $4x^2 + 8x +$  (yellow blocks)

\_\_\_\_\_

3.  $x^2 + 6x +$  (yellow blocks)

\_\_\_\_\_

4.  $x^2 + 2x +$  (yellow blocks)

\_\_\_\_\_

5.  $4x^2 + 12x +$  (yellow blocks)

\_\_\_\_\_