Lesson 1-1: What Do All the Blocks Mean?

Algeblocks can help you learn algebra. But first you need to get to know the blocks and what each block stands for.

Name each block by its dimensions and the area of its largest surface. Notice how the dimensions of the blocks are related to each other.

<table>
<thead>
<tr>
<th>Block Description</th>
<th>Length</th>
<th>Area</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Green Square</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Yellow Rectangle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Yellow Square</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Orange Rectangle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Orange Square</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Light Orange Rectangle</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson 1-2: Reading the Blocks

Like blocks can be grouped to represent greater numbers or expressions.

Example:

Step 1.
Identify the area of each block.

\[ = \text{x}^2 \]

Step 2.
Count the number of blocks.

1 2 3 4

Step 3.
Read the number or expression.
4 of \( \text{x}^2 \)

Step 4.
Record.

\[ 4 \cdot \text{x}^2 \]

Try It

1. You have 5 orange rectangles. What name will you use to name each rectangle?

2. Write the expression represented by all 5 of these Algeblocks. Think about the process used in the example. Describe how you named the expression.

Practice

Use Algeblocks to make your own expressions. Take a handful of like blocks and write the expression represented. Be sure all the blocks in a handful are the same.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson 1-3: Writing Expressions for Groups of Blocks

Unlike blocks can be grouped to represent greater numbers or expressions.

Example:

Step 1.
Sort the blocks
into groups.

Step 2.
Count the number in
each group.

Step 3.
Read the number.

Step 4.
Record.

Try It

1. Suppose that one orange square was included in the group of blocks in the example. What expression would then be represented?

2. Write the expression represented by the following Algeblocks. Think about the process you learned in the example. Describe how you determined the expression represented by the Algeblocks.

Practice

Use Algeblocks to make your own expressions. Take a random handful of blocks and write the expression represented.
Lesson 1-4: Using Blocks to Model Expressions

Algeblocks can be used to model numerical and variable algebraic expressions.

Example: Model the expression \( 3x^2 + 4xy + 1 \)

**Step 1.** Identify the correct block for each part of the expression.

- \( x^2 = \)
- \( xy = \)
- \( 1 = \)

**Step 2.** Model the expression.

\[ 3x^2 + 4xy + 1 \]

**Step 3.** Read the expression.

- \( 3x^2 \) and \( 4xy \) and \( 1 \)

**Step 4.** Record.

\[ 3x^2 + 4xy + 1 \]

**Try it**

1. Which block would you use to model the expression \( 8y^2 \)? How many blocks would you use?

2. Model the expression \( 3x + 4y + 3xy + 5 \). Remember how the example was modeled. Describe how you decided which Algeblocks to use.

**Practice**

Model each expression. Sketch each mat when you have completed each model.

3. \( 2 + 3x + y^2 \)

4. \( 5y^2 + 3 + 2xy \)

5. \( 3x + 5y + 7 \)

continued on next page
Lesson 1-4: Using Blocks to Model Expressions

6. $4x^2 + 2xy + 3x$

7. $5 + xy + 3y^2$

8. $5y + 4 + 3xy$

9. $3y^2 + 6 + 2xy + 3y$

10. $5y + 3y^2 + 2 + 2xy$

11. $3x^2 + 5xy + 2y^2$

12. $2 + 2x^2 + 4xy + 2y^2 + 4x + 2y$

13. $4y^2 + xy + y + 3x^2 + 7 + 3x$