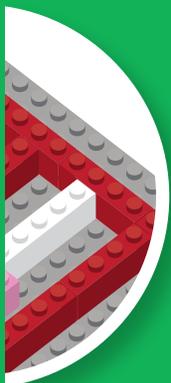
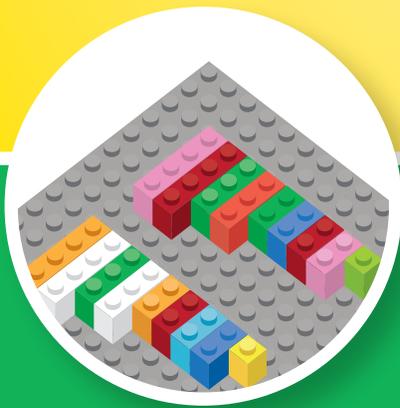
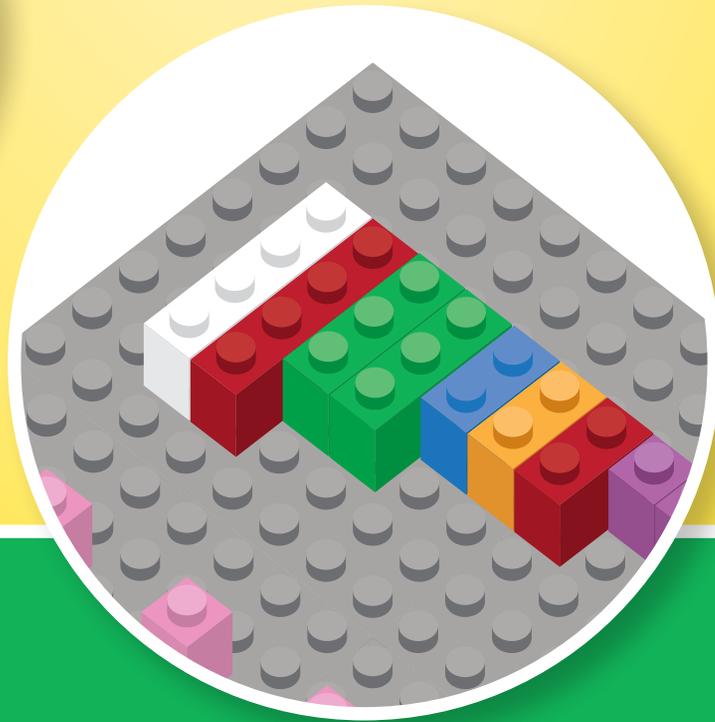
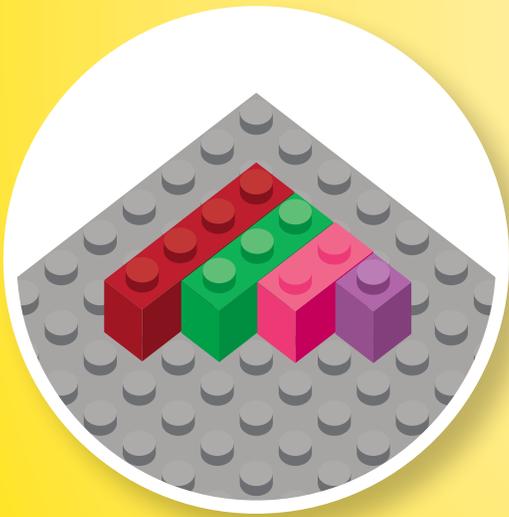


# TEACHING MULTIPLICATION USING LEGO® BRICKS



Dr. Shirley Disseler  
Math Curriculum Expert

Brick Math Series

# TEACHING MULTIPLICATION USING LEGO® BRICKS

Dr. Shirley Disseler





### SUGGESTED BRICKS

Size	Number
1x1	25
2x1	30
3x1	10
4x1	10

Note: Using a base plate will help keep the bricks in a uniform line. Two base plates are suggested for these activities.

## MULTIPLYING LARGER NUMBERS

### Students will learn/discover:

- How to multiply larger numbers by single digit numbers
- The role of place value in reading and understanding numbers
- The use of expanded form when writing a number using its place value
- That multiplication is repeated addition
- Vocabulary:
  - **Multiplier:** the number of sets, or how many times a number is repeated or multiplied
  - **Multiplicand:** the number that is multiplied or repeated

### Why is this important?

This activity provides practice with extending multiplication to larger numbers. This activity links expanded form from addition and subtraction to multiplication. Students must understand the value of digits within a number before multiplying to determine if the final solution is reasonable. Although the modeling process for this activity using bricks may be a bit cumbersome to learn, teachers find that students are very engaged in the process, which helps them understand the math more fluently. The math practices from the National Council of Teachers of Mathematics (NCTM) Principles and Standards encourage the development of fluent computing and practice with modeling processes in the elementary and middle grades.

### Brick Math journal:

After students build their models, have them draw the models on base plate paper and keep them in their Brick Math journals (see page 7 for more about the Brick Math journal). Recording the models on paper after building with the LEGO® bricks helps reinforce the concepts.



## Part 1: Show Them How #1 Solve $3 \times 125$

Make sure students understand the expanded form modeling technique used in Chapter 8 first.

1. Ask students what this problem represents.

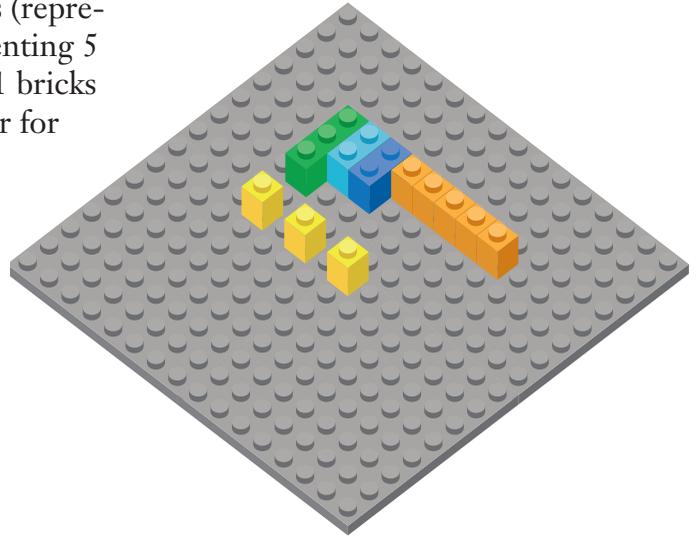
Three sets of 125.

2. Ask students which number is the multiplier and which one is the multiplicand.

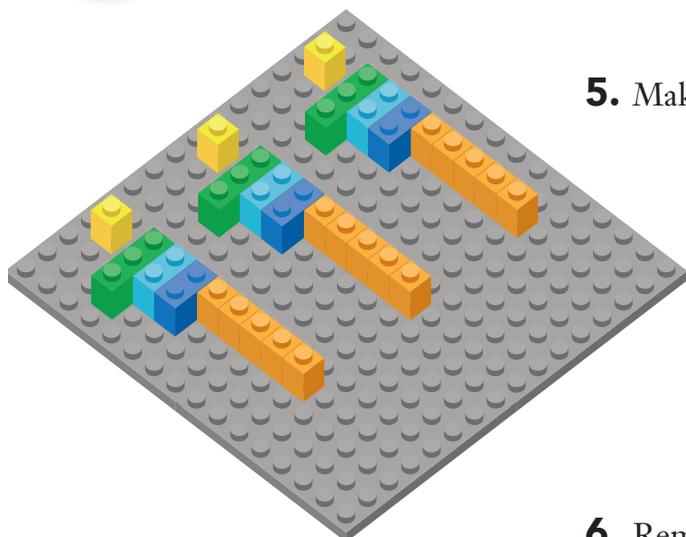
The multiplier is 3 and the multiplicand is 125.

3. Model the problem  $3 \times 125$ .

*Answer:* To model the multiplicand of 125, use one 1x3 brick (representing one hundred), two 1x2 bricks (representing 2 tens or 20), and five 1x1 bricks (representing 5 ones). To model the multiplier of 3, use three 1x1 bricks (representing 3 sets). It is helpful to use one color for these set marker bricks.

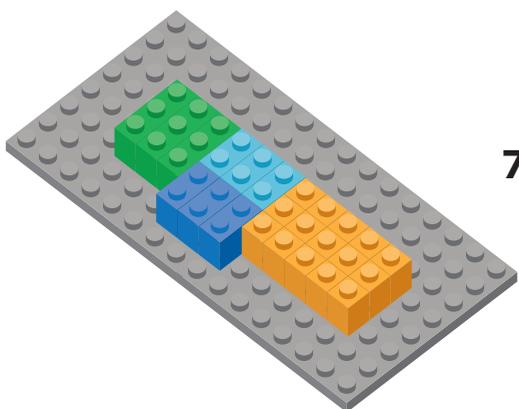


4. Take each 1x1 brick and break them into 3 sets on another base plate.



5. Make 3 sets of the multiplicand bricks.

6. Remove the set marker bricks (the 1x1 bricks).



7. Place like blocks together to make hundreds, tens and ones.

8. Point out that this model shows the expanded form  $300 + 60 + 15$  in the solution.

Regroup the ones to one more ten (one 1x2 brick) and 5 ones, making the expanded form  $300 + 70 + 5 = 375$ .

## PRAISE FOR THE BRICK MATH SERIES: TEACHING MATH USING LEGO® BRICKS

“I finally know what a fraction is. I can *see* it!”

—Student

“Why doesn’t everyone learn math this way?”

—Student

“As an elementary teacher, exploring varying methods of learning is always necessary. From the very first activity in *Teaching Multiplication Using LEGO® Bricks*, it is clear that this book is extremely useful for any student learning (or struggling with) multiplication. For example, when learning/discussing fact families, I have witnessed many students blindly memorizing the facts without truly understanding *why* there is a relationship between the facts. By using different sizes of LEGO® bricks in one of the activities in this book, students are able to build and then observe a visual representation of the fact families. The students are able to see that one 1x6 brick contains the same number of studs as two 1x3 bricks.

In my experience as an educator, students tend to deeply grasp a concept whenever they are fully immersed in the learning process. The activities in this book require students to think critically about the process of multiplication that so often becomes robotic. *Teaching Multiplication Using LEGO® Bricks* covers multiplication processes such as: bundling, repeated addition, using place value, using array models, one-to-one correspondence, and more. Rather than blindly following a set of steps, students are able to build and think critically about what is happening as the problem evolves.

This book is a must-have for any educators exploring multiplication!”

—Elementary Teacher

“As an instructional coach at an elementary school, I have been searching for a teacher-friendly text that emphasizes the educational aspects of LEGO® bricks. *Teaching Multiplication Using LEGO® Bricks* helps breathe life back into mathematics, particularly multiplication instruction. The progression from basic multiplication principles to two- and three-digit multiplication problems is seamless. The students’ understanding of these concepts is reinforced when using the LEGO® bricks, and the text encourages students to explain their findings. I recommend *Teaching Multiplication Using LEGO® Bricks* to everyone in education who wants to take the next step in hands-on learning.”

— Kelli Coons, Instructional Coach

“*Teaching Fractions Using LEGO® Bricks* is a great resource for children to learn about fractions with conceptual understanding and modeling. It’s hands-on, engaging, and overall an exciting way to learn about fractions. When you bring LEGO® bricks into the classroom the students automatically react with “ooh, cool!” and they are hooked on the activity. There is nothing better as a teacher than seeing your students enjoy learning, and using this resource, I see that. Another great feature about this resource is that it utilizes various learning modalities. Students learn physically by manipulating the LEGO® bricks, they draw the models for a visual reference, they write and describe concepts for a verbal understanding, and they are able to reason about the models and concepts to have a comprehensive understanding of fractions. Overall, this resource is phenomenal, and students are sure to be excited about math and fractions!”

—Tina Lupton, Teacher

“The visual models in *Teaching Fractions Using LEGO® Bricks* helped my students see and understand how equivalent fractions really work. The activities are super easy to follow and make learning operations with fractions fun for both the students and the teacher!”

— Jamie Piatt, Fifth Grade Teacher

## *Teaching Multiplication Using LEGO® Bricks*

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