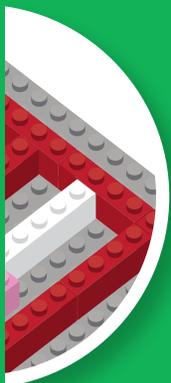
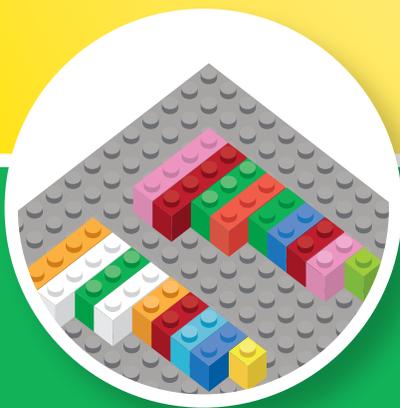
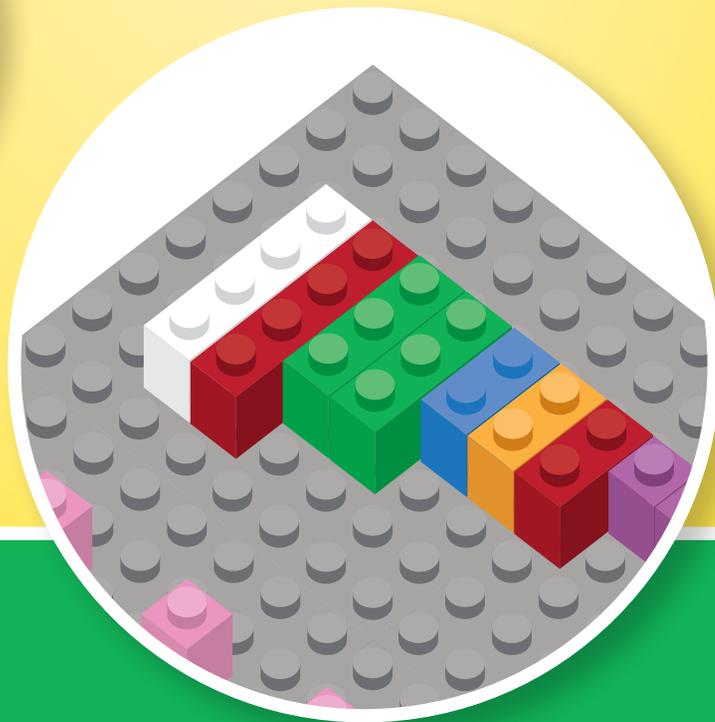
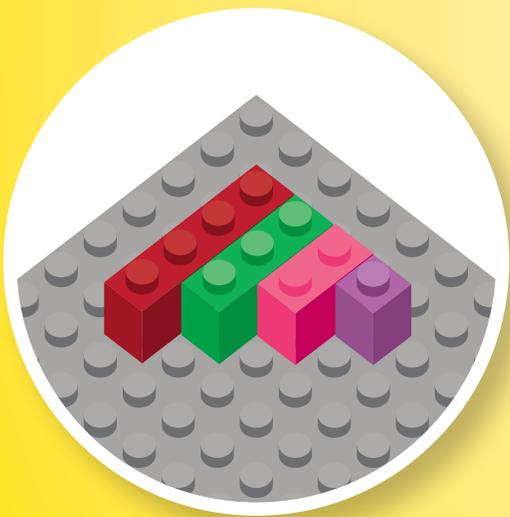


# TEACHING MULTIPLICATION USING LEGO® BRICKS



Dr. Shirley Disseler  
Math Curriculum Expert

Brick Math Series

# TEACHING MULTIPLICATION USING LEGO® BRICKS

Dr. Shirley Disseler





# MULTIPLICATION USING SET MODELS

## Students will learn/discover:

- How to model multiplication as sets of numbers
- The structural design of multiplication problems
- The meanings for the numbers in multiplication problems
- Vocabulary:
  - **Set**
  - **Group**
  - **Multiplicand**
  - **Multiplier**
  - **Product**
  - **Factors**

## Why is this important?

Students in grades 2 and 3 build on the sorting ideas learned in K – 1. They give names to sets and interpret information about sets, number of sets, number of groups, and “how many in all” as repeated addition. This activity is designed to help students make meaning of the term “set.”

## 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 more about the Brick Math journal). Recording the models on paper after building with the LEGO® bricks helps reinforce the concepts.

## SUGGESTED BRICKS

Size	Number
1x1	10 (5 colors)
1x2	10 (5 colors)

Have a variety of bricks for these activities to provide opportunities for students to offer different solutions and for the teacher to create other models.

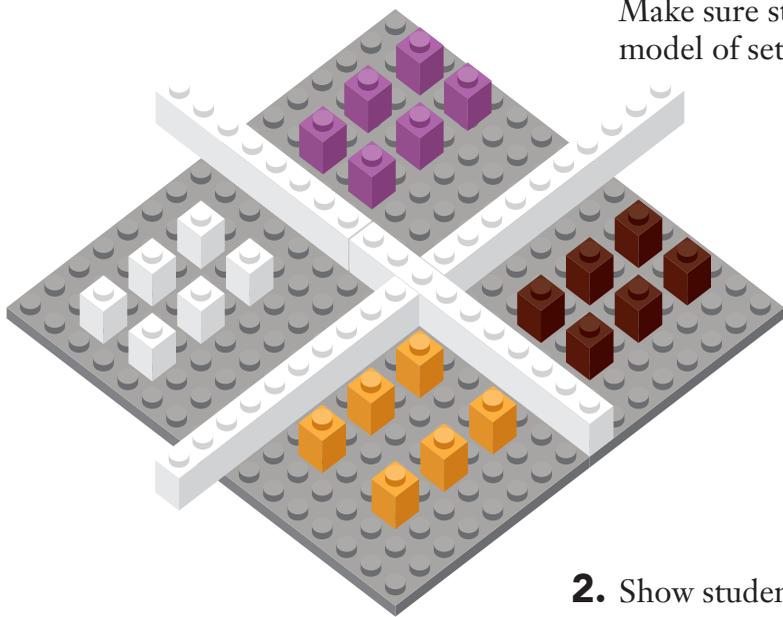
Note: A number of 1x10 or 1x12 bricks are also needed to serve as set separators.

Note: Using a base plate will help keep the bricks in a uniform line. One small and one large base plate is suggested for these activities.



## Part 1: Show Them How #1 Model 4 sets of 6

1. Use the LEGO® bricks to make a model of 4 sets of 6. Make sure students are using 1x1 bricks because it is a model of sets of six ones.

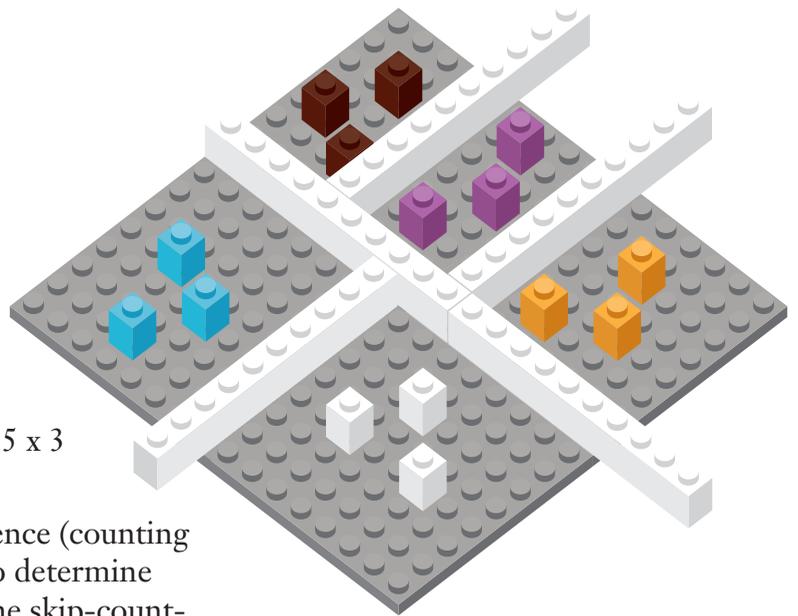


2. Show students that 4 sets of 6 is written as  $4 \times 6$
3. Have students use one-to-one correspondence (counting by ones, pointing to each stud) to determine the answer. Students should demonstrate knowledge that counting four sets of six in each set will result in a total of 24.
4. Make sure students understand that 4 equals the number of sets (groups) and 6 equals the number in each set. If they learn this structure for multiplication facts, they will understand the difference between  $4 \times 6$  and  $6 \times 4$ .



## Show Them How #2 Model 5 sets of 3

1. Use bricks to model 5 sets of 3.  
Make sure students use 1x1 bricks.



2. Show students that 5 sets of 3 is written as  $5 \times 3$
3. Have students use one-to-one correspondence (counting by ones, pointing to each stud) if needed to determine the answer. This is a good time to utilize the skip-counting methods learned in grades K - 1 and count by threes. Students should demonstrate that these methods result in the answer to the problem of 15.
4. Make sure students understand that the 5 equals the number of sets (groups) and the 3 equals the number in each set. If they learn this structure for multiplication facts, they will understand the difference between  $5 \times 3$  and  $3 \times 5$ .

Introduce the terms “multiplier” (the number of groups or sets) and “multiplicand” (the size of each group). In this problem, the multiplier is 5 and the multiplicand is 3.

Introduce the term “factors” as the name for the numbers 5 and 3.

5. Ask students to explain their models, and have them write an explanation and draw their models in their Brick Math journals.

## 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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