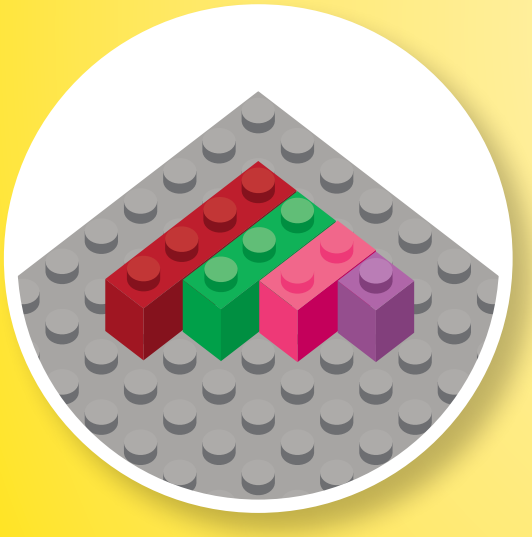
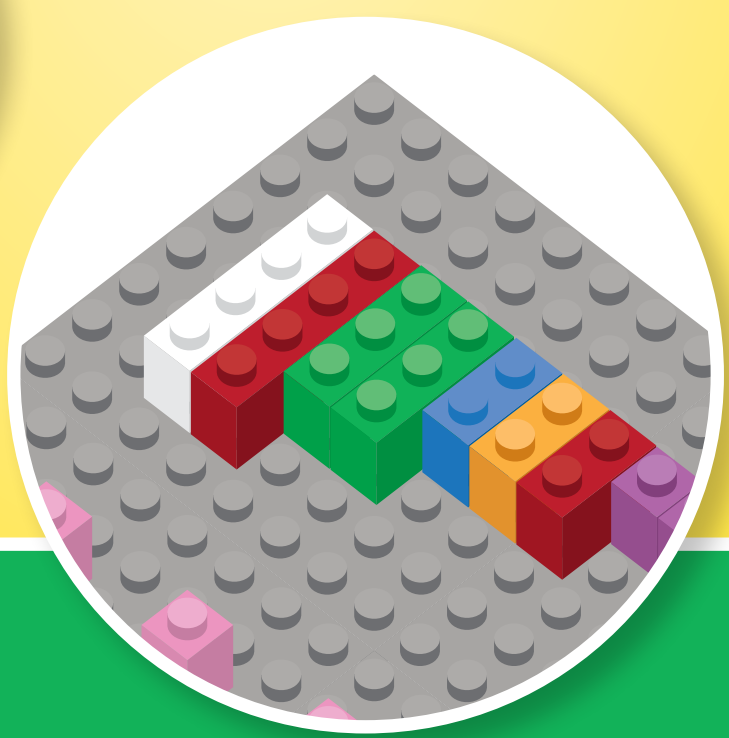
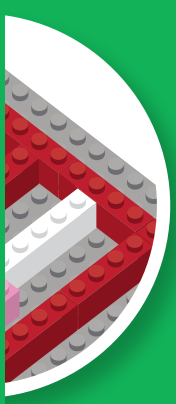
Brick Math Series

TEACHING MULTIPLICATION USING LEGO® BRICKS







Dr. Shirley Disseler
Math Curriculum Expert

Brick Math Series

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6

SUGGESTED BRICKS

Size	Number
1x1	5
1x2	6-10
1x3	6
2x3	4
2x4	4

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

MULTIPLICATION USING ARRAY/AREA MODELS

Students will learn:

- How to model multiplication using arrays

Why is this important?

The array/area model helps students understand one-digit multiplication.

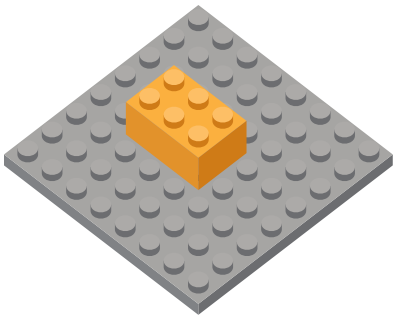
Brick Math journal:

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

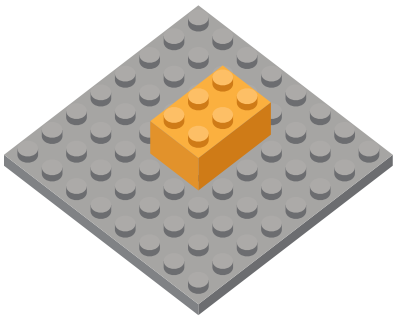
1. Make an array/area model of 3 x 2 using one brick.

   Array model showing 3 x 2: 3 studs across and 2 studs down.



2. Make an array/area model of 2 x 3 using one brick.

   Array model showing 2 x 3: 2 studs across and 3 studs down.



3. By counting the studs, students can determine the answer to each problem: 6.

4. Use the terminology:

   The **product** (6) is found by multiplying the two **factors** (3 and 2) together: 3 x 2 = 6

5. Discuss how these two array models are alike and different.

   Both give the same answer, but the solution is different because the orientation (vertical versus horizontal) is different. These two multiplication facts (2 x 3 and 3 x 2) have the same outcome in terms of answer or product. However, they mean something different in terms of geometric concepts. For example, if you are building a store and want the front of the store to have the longest side facing the street front, you want to use the 3 x 2 model. For engineering, orientation is important when modeling multiplication!

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 "oooh, 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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