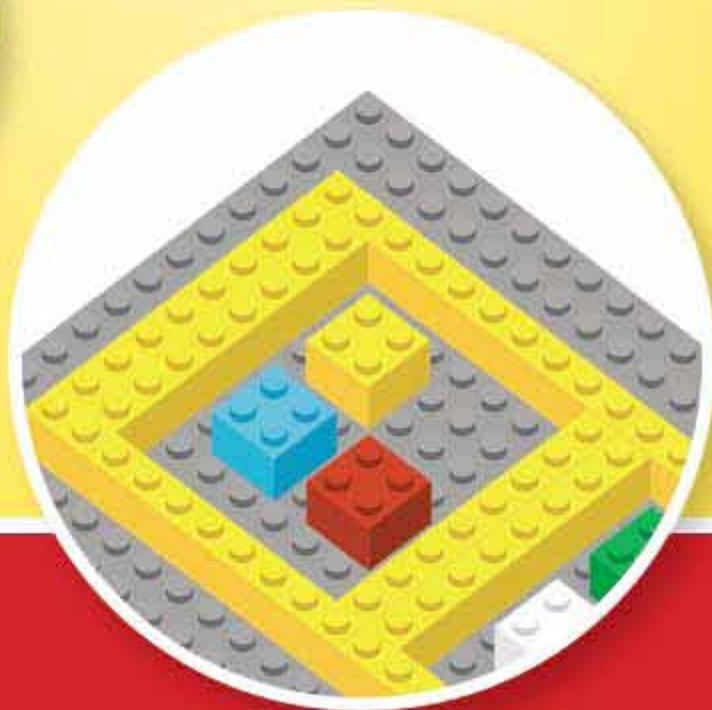
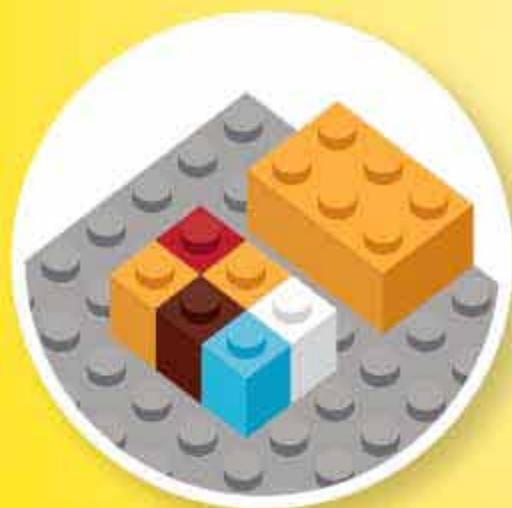


Brick Math Series

TEACHING DIVISION USING LEGO® BRICKS



Dr. Shirley Disseler
Math Curriculum Expert

Brick Math Series

TEACHING DIVISION USING LEGO® BRICKS

Dr. Shirley Disseler





SUGGESTED BRICKS

Size	Number
1x1	24
1x2	16
1x3	8
1x4	8
1x6	12
1x12	6
2x2	8
2x3	8
2x4	8
2x6	6

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

EQUAL SHARES OR PARTITIVE DIVISION

Students will learn/discover:

- The definition of partitive division
- What it means to have equal shares
- What it means to divide parts of a whole

Why is this important?

Partitive division is a basic concept and involves taking the whole and dividing it into equal parts. Understanding what it means to divide into equal parts provides a basis for division as well as other math concepts such as fractions. Very early on, children begin to learn this idea when they are sharing.

This activity uses a different modeling strategy than has been used in earlier chapters. Students respond to different strategies depending on their individual learning styles, and it is helpful to expose them to a number of different strategies.

Brick Math journal:

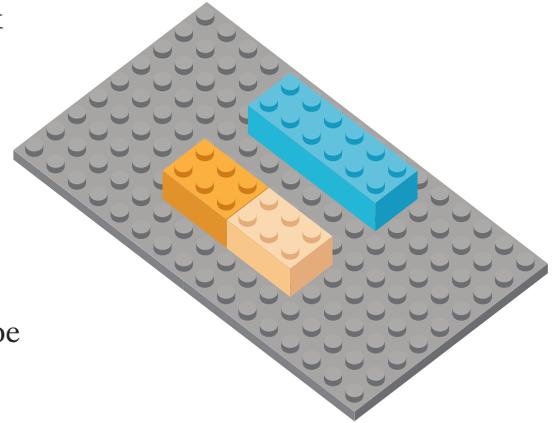
After students build their models, have them draw the models on base plate paper and keep them in their Brick Math journals (See page 7 for more about the Brick Math journal). Recording the models on paper after building with the LEGO® bricks helps to reinforce the concepts and engages both the creative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



Part 1: Show Them How

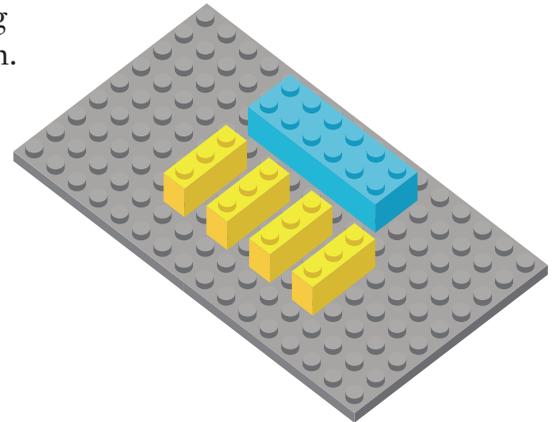
1. Place a 2x6 brick on a base plate. Explain that this brick represents 12 pieces of candy—each stud is one piece. Tell students that will share this candy equally with a friend. Ask them to find two bricks that show how many pieces each person gets.

Students should choose two 2x3 bricks so that each friend gets 6 pieces of candy. Have students draw their solution model in their Brick Math journals and describe what the model shows.



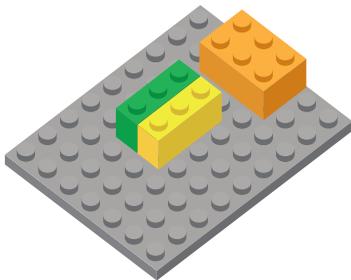
2. Model how to share the same 12 pieces of candy among four friends. Ask students how that changes the solution.

Students should show four 1x3 bricks as the solution. Have them draw this model in their Brick Math journal and explain their solution.

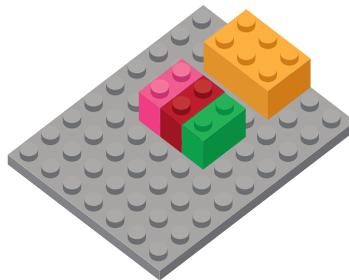


3. Place a 2x3 brick on a base plate. Have students discuss some ways this amount could be equally shared among two friends, three friends, and six friends.

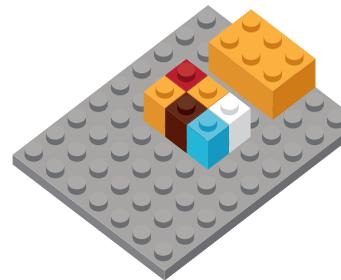
Introduce the term *partitive division*, explaining that it means dividing a whole into equal shares. Ask students to model the division, draw the model in their Brick Math journals, and write a word problem to show the equal sharing of the total amount.



Six candies shared equally between 2 friends.



Six candies shared equally among 3 friends.



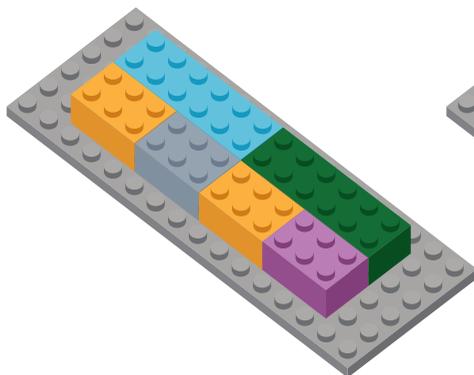
Six candies shared equally among 6 friends.

Note: Make sure students use the term “shared equally” in their word problems.

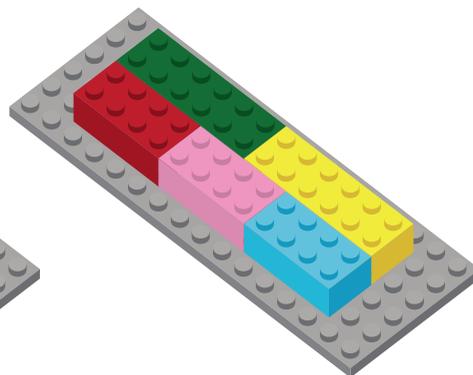


4. Place two 2x6 bricks on a base plate. Point out that this whole is equal to 24. Ask students to show as many ways as possible to equally share this amount, then draw their solutions in their Brick Math journals and write a word problem for each solution.

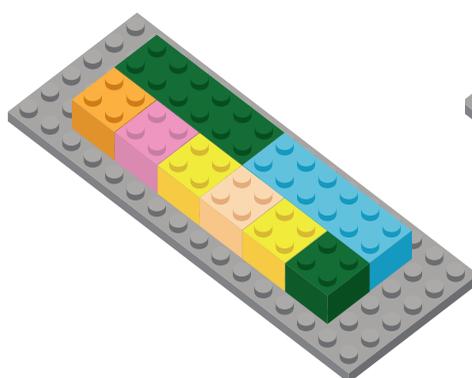
There are seven possible solutions. Four are illustrated:



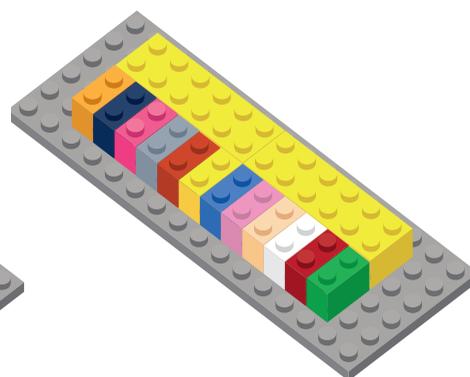
24 shared equally into 4 sets of 6. Each one of the 4 friends gets 6 pieces.



24 shared equally into 3 sets of 8. Each one of the 3 friends gets 8 pieces.



24 shared equally among 6 friends. Each friend gets 4 pieces.



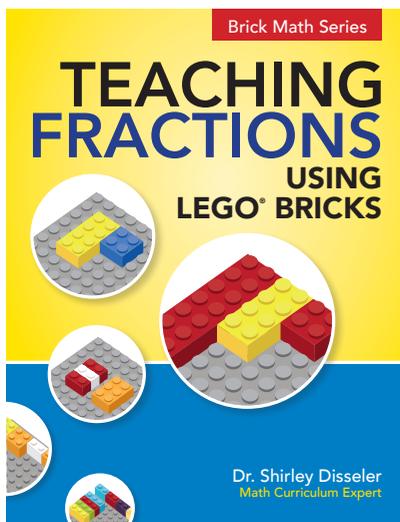
24 shared equally among 12 friends. Each friend gets 2 pieces.

Correct models also include: eight 1x3 bricks, twenty-four 1x1 bricks, and two 2x6 bricks.

Also in the Brick Math Series:

TEACHING FRACTIONS USING LEGO® BRICKS

Dr. Shirley Disseler



Teaching and learning fractions is easy using LEGO® bricks!

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Math is fun when you're using LEGO® bricks to learn!

Author Dr. Shirley Disseler is Associate Professor at High Point University and Chair of the Department of Elementary and Middle Grades Education. She serves on the LEGO® Education Ambassadors Panel.

Companion student edition:

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Individual student book that follows the teacher's curriculum, complete with additional activities for practice and assessments.

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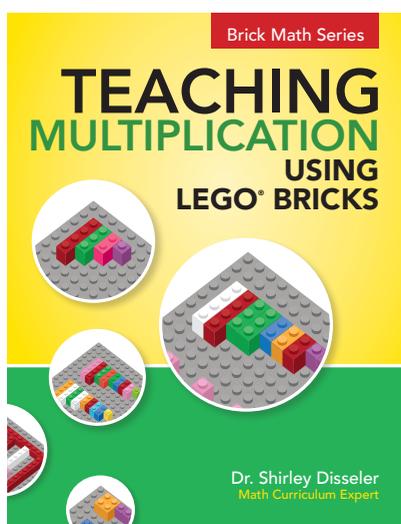
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Dr. Shirley Disseler



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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 Division Using LEGO® Bricks

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Published by Brigantine Media/Compass Publishing
211 North Avenue, St. Johnsbury, Vermont 05819

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211 North Avenue
St. Johnsbury, Vermont 05819
Phone: 802-751-8802
Fax: 802-751-8804
E-mail: neil@brigantinemedia.com
Website: www.compasspublishing.org

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Phone: 802-751-8802 | Fax: 802-751-8804
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ISBN 978-1-9384065-7-7