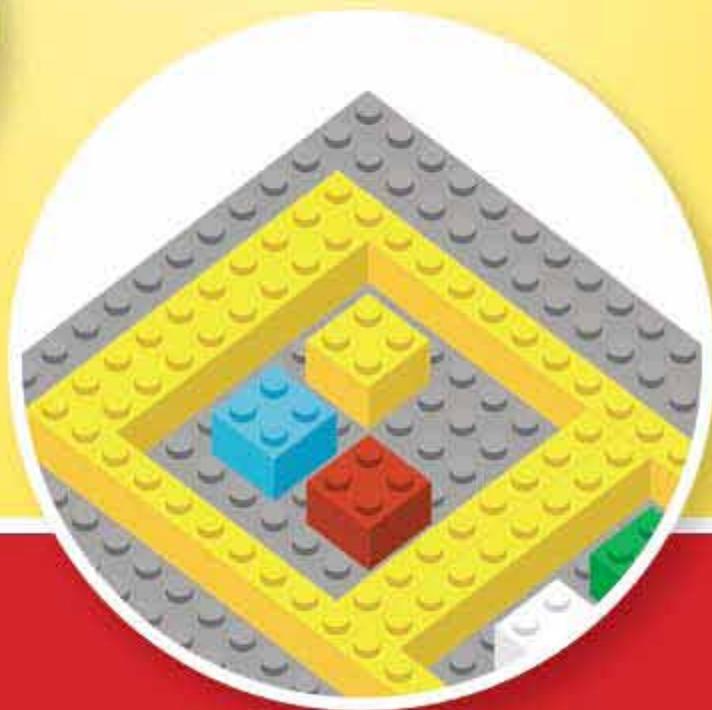
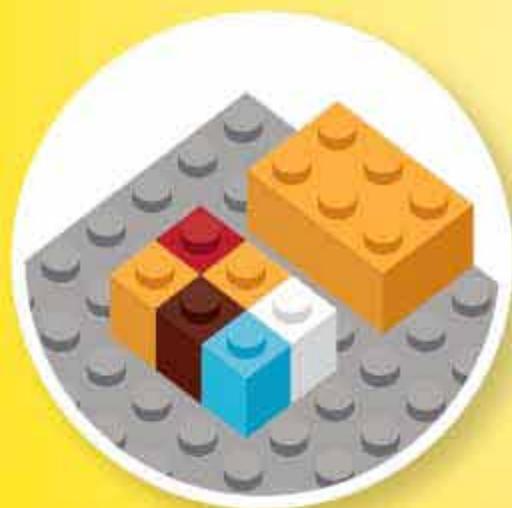


Brick Math Series

TEACHING DIVISION USING LEGO® BRICKS



Dr. Shirley Disseler
Math Curriculum Expert

Brick Math Series

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TWO-DIGIT DIVISION

Students will learn/discover:

- The process of dividing a two-digit number by a one-digit number
- What it means to divide parts of a whole
- What it means to have a remainder

Why is this important?

Understanding the division of two-digit numbers provides a basis for mental math and estimation. This process is important for other concepts such as fractions and algebra.

This activity uses the modeling strategy of stud covering.

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.

SUGGESTED BRICKS

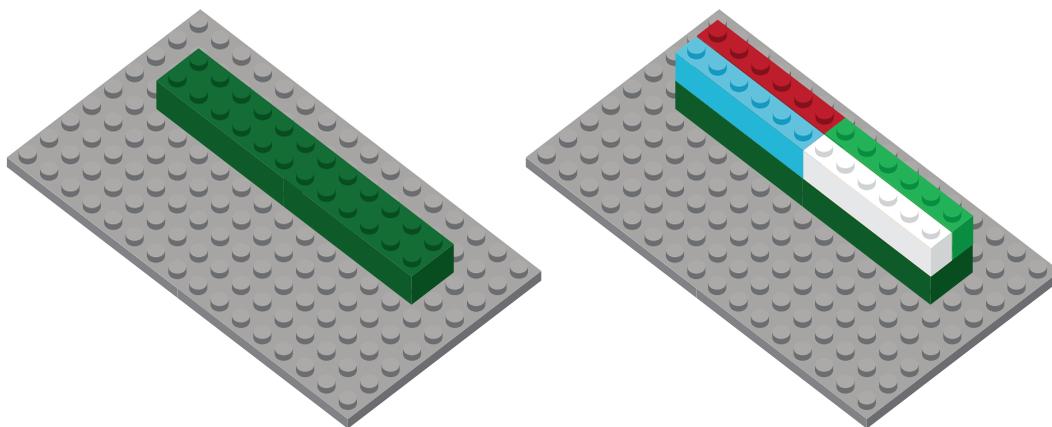
Size	Number
1x2	16
1x3	10
1x4	10
1x6	6
2x2	18
2x3	8
2x4	8
2x6	6
2x8	3

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



Part 1: Show Them How

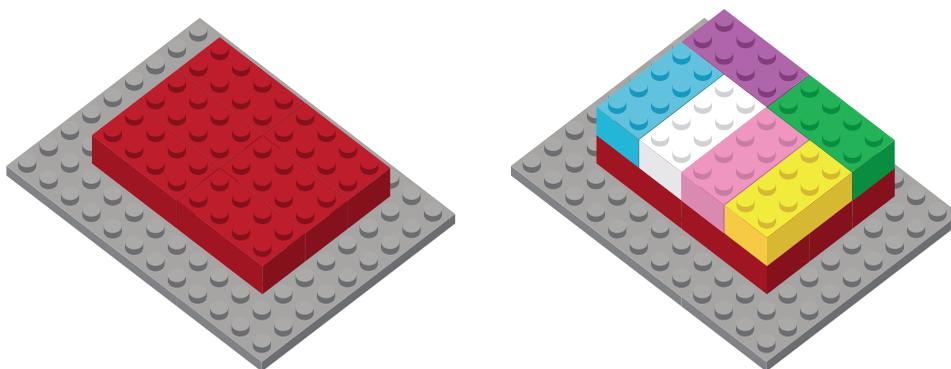
1. Model the number 24 with two 2x6 bricks of the same color. This is the dividend, or the whole that will be divided. Use 6 as the divisor (the number the whole is divided by). The division number sentence is $24 \div 6 = \square$
2. Ask students to find some bricks that have exactly 6 studs. Place the 6-stud bricks on top of the model of 24 until it is covered completely. Count the number of bricks covering the surface of the model of 24 to get the quotient (4). Have students draw the model and explain their thinking in their Brick Math journals.



3. Build a model that shows 48 studs. This represents the dividend.

Cover the studs on this model using a divisor of 8. Have students write a division sentence for this problem.

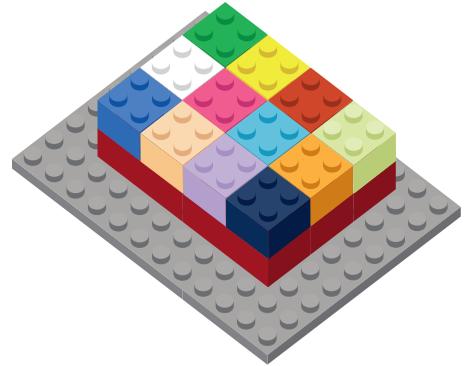
(Answer: $48 \div 8 = 6$) Students could also view the model as 48 divided into 6 sets, with 8 in each set, or $48 \div 6 = 8$.



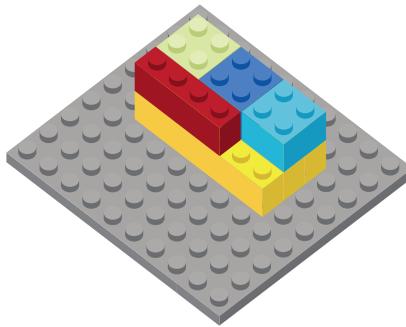
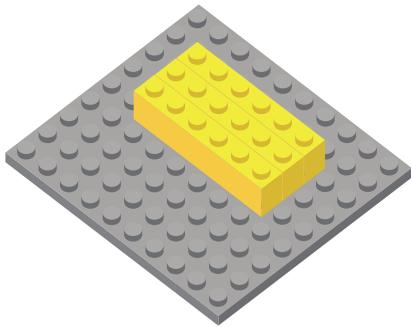


Have students draw their models and explain their thinking in their Brick Math journals.

4. Cover the same model with bricks to show 48 divided by 4. What is the quotient? (Answer: 12) What is the division sentence? (Answer: $48 \div 4 = 12$) Students could also view the model as 48 divided into 12 sets, with 4 in each set, or $48 \div 12 = 4$.



5. Model the number 18 as the dividend. Using 4 as the divisor, cover each set of 4 studs on the model.



Ask students: what is different about this model?
(Answer: There are 2 studs that cannot be covered by 4-stud bricks.)

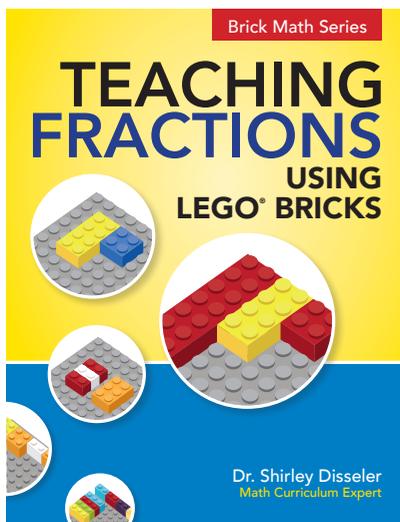
Explain that the two studs left over represent the remainder.

The solution for this problem is written as: 3 bricks remainder 2 studs.

Also in the Brick Math Series:

TEACHING FRACTIONS USING LEGO® BRICKS

Dr. Shirley Disseler



Teaching and learning fractions is easy using LEGO® bricks!

Teachers as well as parents can follow the step-by-step instructions to guide students as they learn to recognize fractions, to add and subtract fractions, and to find factors and equivalent fractions. Students model hands-on math problems with LEGO® bricks to develop true understanding of the concepts of fractions.

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:

LEARNING FRACTIONS USING LEGO® BRICKS

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

Available on Amazon and at compasspublishing.org.

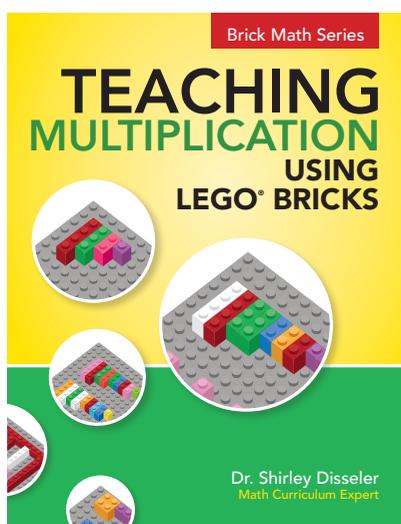
Quantity pricing and classroom packs available at 802-751-8802 or neil@compasspublishing.org.



Also in the Brick Math Series:

TEACHING MULTIPLICATION USING LEGO® BRICKS

Dr. Shirley Disseler



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Teachers as well as parents can follow the step-by-step instructions to guide students as they learn multiplication facts, one-digit multiplication, and two-digit and larger multiplication. Students model hands-on math problems with LEGO® bricks using a variety of techniques—sets, arrays, and place values—to develop true understanding of the concepts of multiplication.

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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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