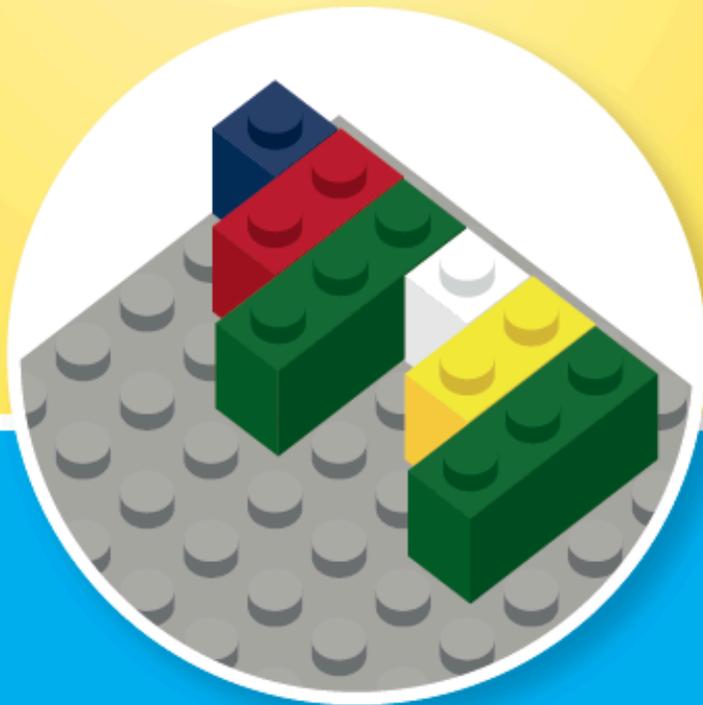
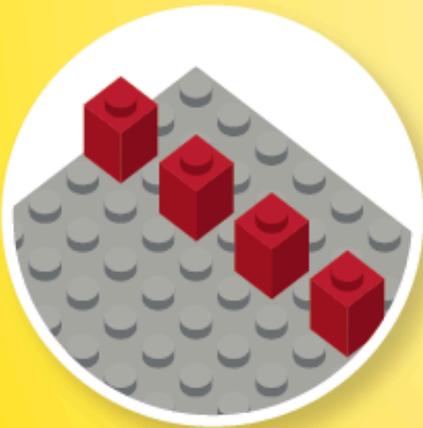


Brick Math Series

TEACHING COUNTING AND CARDINALITY

USING LEGO® BRICKS



Dr. Shirley Disseler
Math Curriculum Expert

Brick Math Series

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SUGGESTED BRICKS

Size	Number
1x1	10
1x2	10
1x3	8
1x4	8
1x6	8
1x8	4
1x10	4
1x12	4
2x2	4
2x4	8
2x8	2

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

SKIP-COUNTING

Students will learn/discover:

How to skip-count by 2s, 3s, 5s, and 10s

Why is this important?

Skip-counting is a prerequisite to mastering multiplication based upon repeated addition models. At an early age, students should be able to skip-count by 2s, 3s, 5s, and 10s. Students in early grades (K-2) are preparing for the idea of multiplication from a set perspective. Skip-counting leads to set models. Also, repeated addition models based on skip-counting on a number line provide a visual representation of what is happening when jumps are made in equivalent increments.

Vocabulary:

- Skip-counting: Counting by a number other than 1 (i.e., by 2s, by 3s, etc.)
- More than
- Greater than

How to use the companion student book, *Learning Counting and Cardinality with LEGO® Bricks*:

- After students build their models, have them draw the models and explain their thinking in the student book. Recording the models on paper after building them with bricks helps reinforce the concepts being taught.
- Discuss the vocabulary for each lesson with students as they work through the student book.
- Use the assessment in the student book to gauge student understanding of the content.



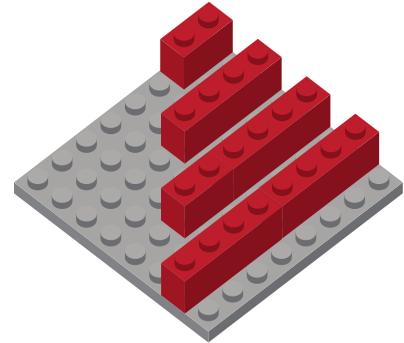
Part 1: Show Them How

1. Build a model of skip-counting by 2s and show it to the students. Have each student build the same model.

Ask students what they notice about this model.

Possible responses include:

- It looks like a stair step from smallest to largest.
- Each one is two more than the one before it.
- There are eight studs in the longest column.



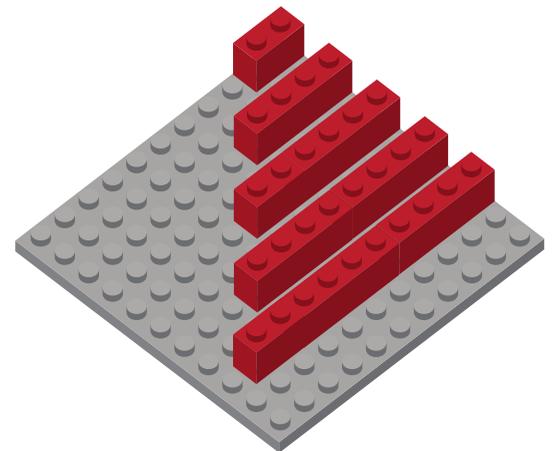
2. Explain to students that this is a model of skip-counting by 2s. Have them count with you aloud: “two studs, four studs, six studs, eight studs.”

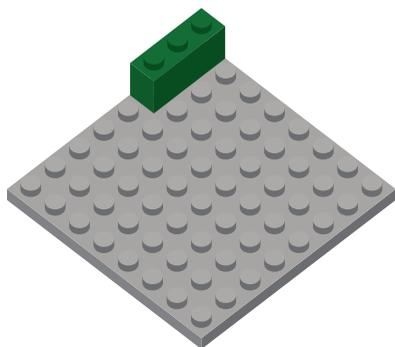
3. Ask students what number would come next in the model. *Note:* This provides background for identifying patterns in mathematics.

Students should determine that the next number would be 10.

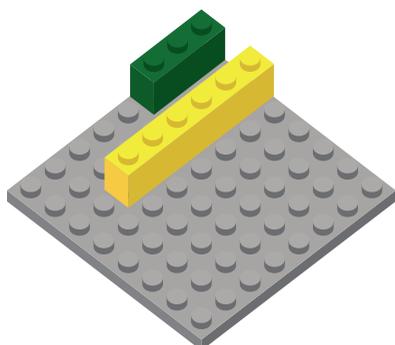
Add a column of ten studs to your model while students do the same to their models. *Note:* Use a combination of bricks to build the 1x10 configuration, if necessary. It may be clearer to students if all bricks used are the same color.

Skip-count aloud with students: “two studs, four studs, six studs, eight studs, ten studs.”



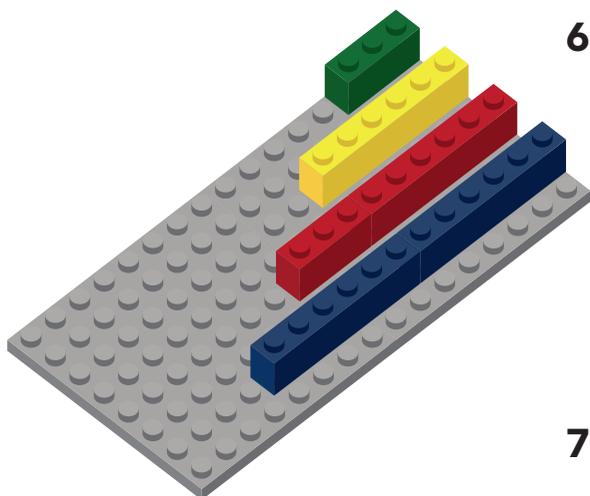


4. Start to build a model of skip-counting by 3s. Show the first 1x3 brick. Have students build the same model.



5. Ask students what brick is added next to a model showing skip-counting by 3s.

Have students find one brick (or a combination of bricks) and add it to their models. Do the same to your model and display it.



6. Ask students to model the next two steps in skip-counting by 3s.

Check student models to make sure they have successfully added bricks showing 9 studs and 12 studs to their models. *Note:* Students will have to use combinations of bricks to make a 1x9 column of bricks and possibly 1x12. It may be clearer to students if all bricks used in each column are the same color.

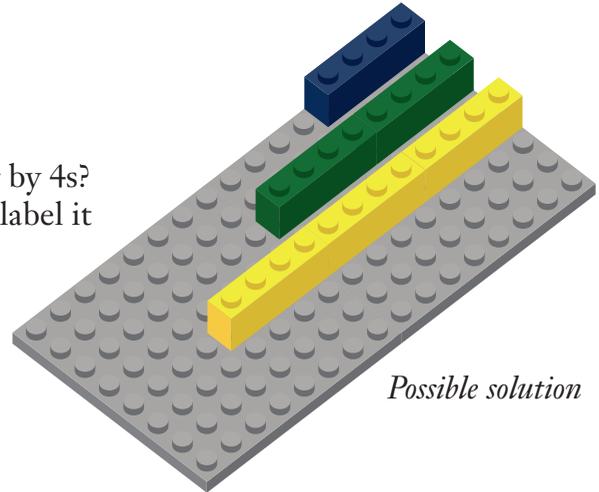
7. Have students count aloud by 3s and touch each column of bricks as they count: “three studs, six studs, nine studs, twelve studs.”
8. Ask students how many studs are needed to model the next number in the skip-counting by 3s. Students should answer: 15 studs.



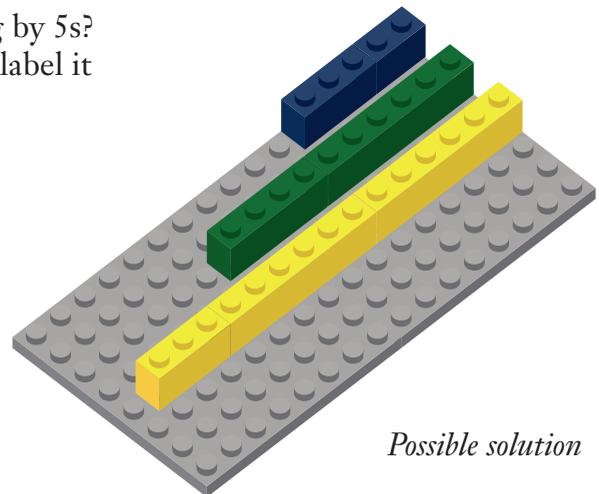
Have students add a column of bricks equaling 15 studs to their models. Do the same to your model and display it.
Note: Students will have to use combinations of bricks to make a 1x15 column of bricks. It may be clearer to students if all bricks used are the same color.

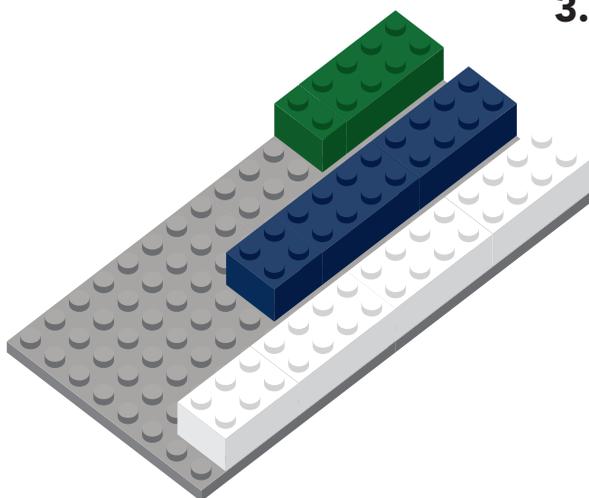
Part 2: Show What You Know

1. Can you build a model that shows skip-counting by 4s? Build at least three steps. Draw your model and label it to show how you counted.



2. Can you build a model that shows skip-counting by 5s? Build at least three steps. Draw your model and label it to show how you counted.





Possible solution

3. Can you build a model that shows skip-counting by 10s? Build at least three steps. Draw your model and label it to show how you counted.

4. Choose a number. Do not tell anyone your number. Can you model a skip-counting pattern with your secret number? Show your partner your model and have your partner identify the skip-count pattern.

Answers will vary.

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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Brigantine Media/Compass Publishing
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
www.compasspublishing.org
ISBN 978-1-9384065-7-7