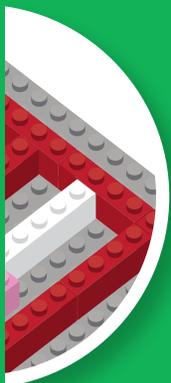
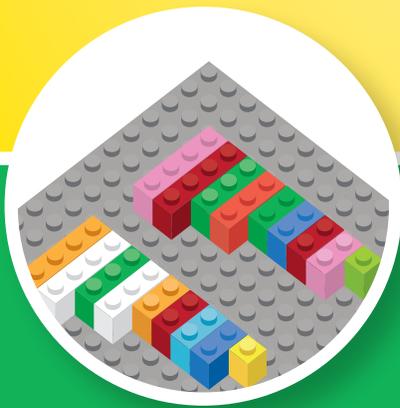
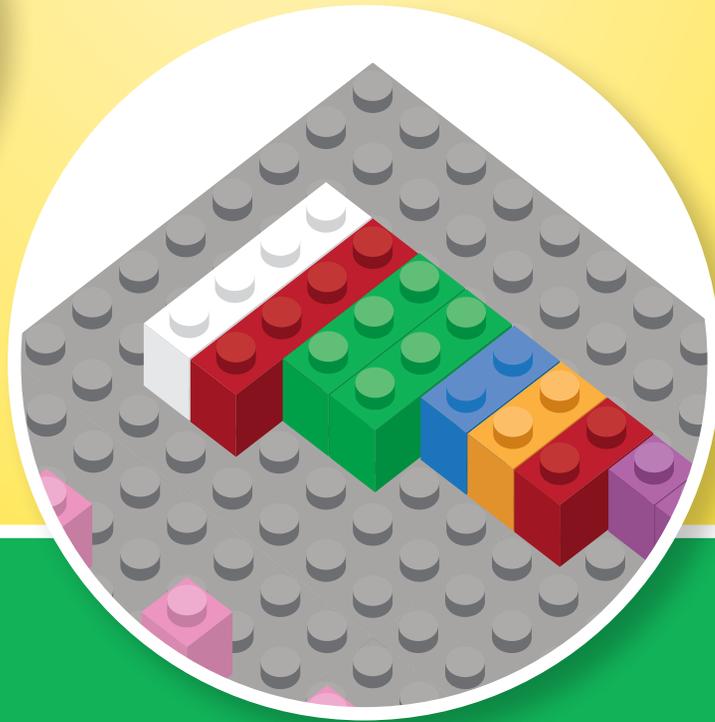
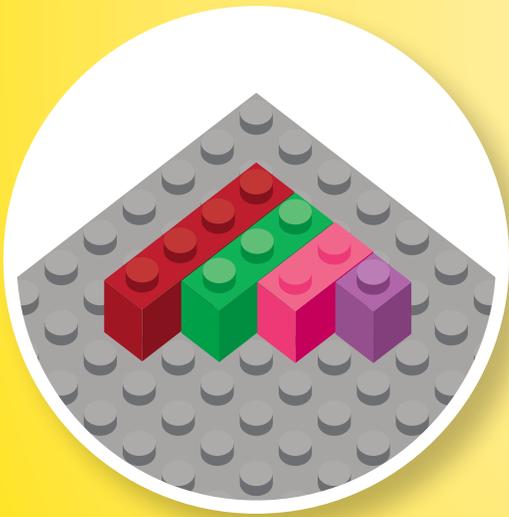


TEACHING MULTIPLICATION USING LEGO® BRICKS



Dr. Shirley Disseler
Math Curriculum Expert

Brick Math Series

TEACHING MULTIPLICATION USING LEGO® BRICKS

Dr. Shirley Disseler





SUGGESTED BRICKS

Size	Number
1x1	30
1x2	10
1x3	10
1x4	5
1x10	5
2x4	6-8

Note: Have a variety of colors of all bricks. Use additional 1x10, 1x12, and 1x16 bricks as set dividers.

Note: Using a base plate will help keep the bricks in a uniform line. Use one large base plate for these activities.

MULTIPLICATION MODELING CHALLENGE

This activity brings together the knowledge gained from the previous chapters. It can serve as an assessment task to be sure students have learned how to model using sets, place value, and arrays. It can also be set up as a station task in the classroom.

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.

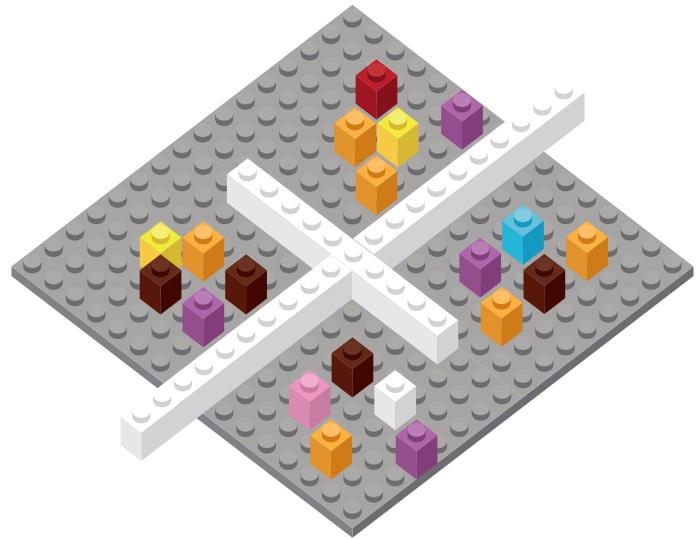


1. Can you model 4×5 using a set model?

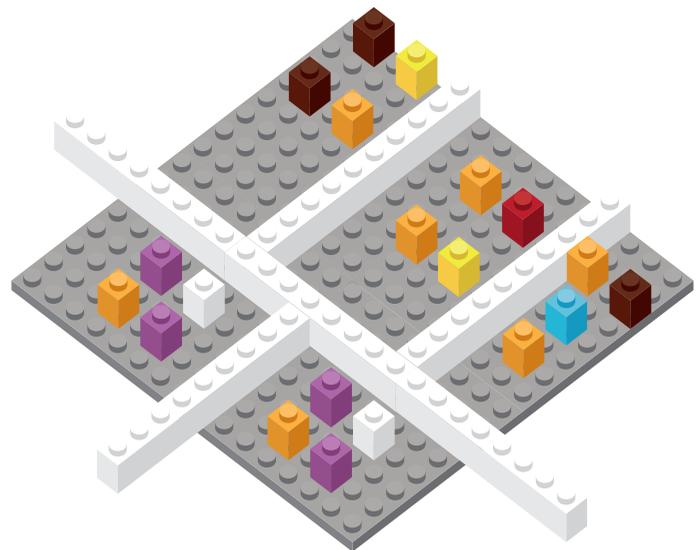
Explain your model in your Brick Math journal. Draw your solution. What is the product?

How is 4×5 different from 5×4 ? Can you show the difference?

Answer: Students should point out that the two models have the same product (20) but that one has 4 sets of 5 and one has 5 sets of 4, making the number of groups and number in each group different.



4 sets of 5

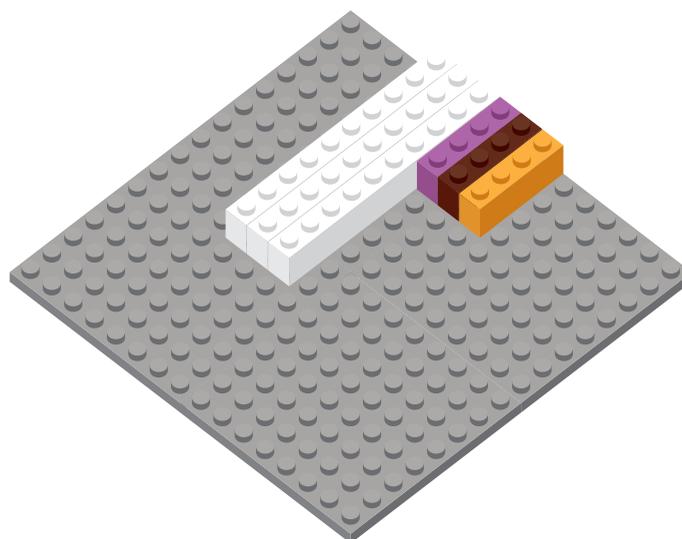
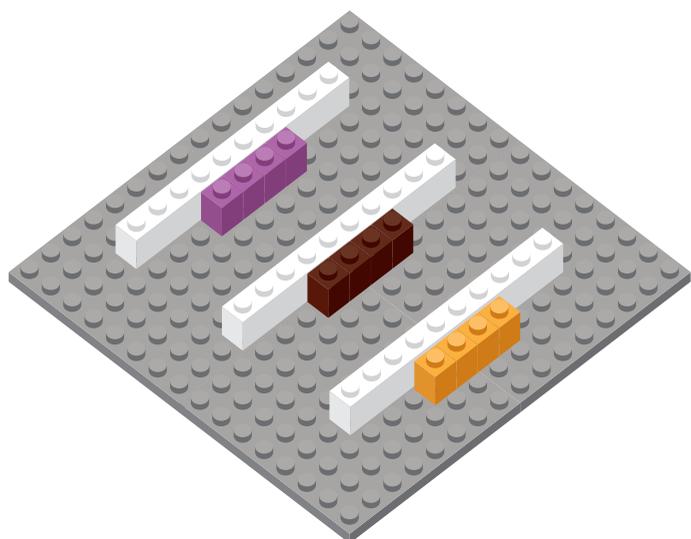


5 sets of 4



2. Can you model 3×14 using a place value model? Explain your model in your Brick Math journal. Draw your solution. What is the product?

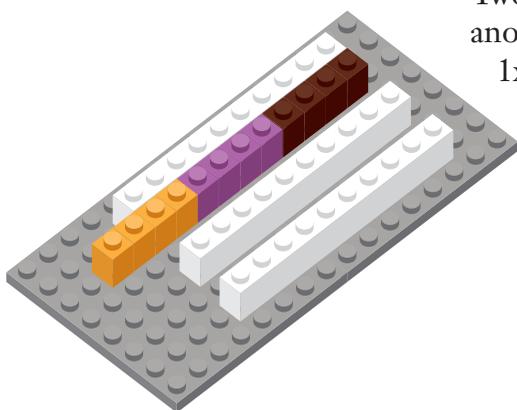
Answer: Students should be able to combine tens (3) and combine ones (12) to show an answer of $30 + 12 = 42$.



More for students to discover:

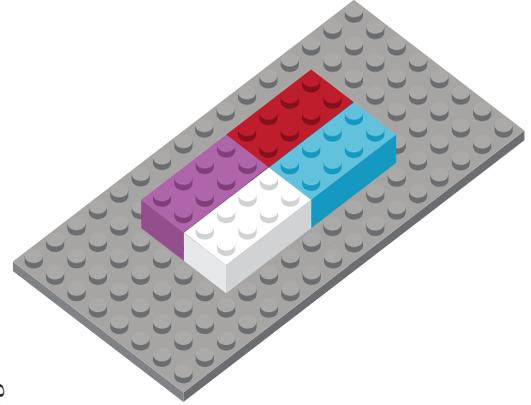
This is a great time to discuss expanded form and to discuss regrouping with students. Model how 12 in this answer is equal to 1 set of ten and 2 ones.

Answer: Move the 12 ones to line up next to a 1x10 brick. Two 1x1 bricks are left over. Students can see that there is another set of ten in the answer (4 sets of ten) and 2 more 1x1 bricks, making the answer 42.





3. Can you make an array/area model of 4×8 ?



4. Can you make an array/area model of a square number?

Answer: Various models apply, including any that result in a model that is a square (2×2 , 3×3 , 4×4 , etc.).

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

Copyright ©2016 by Shirley Disseler
Published by Brigantine Media/Compass Publishing
211 North Avenue, St. Johnsbury, Vermont 05819

Cover and book design by Anne LoCascio
Illustrations by Curt Spannraft
All rights reserved.

Your individual purchase of this book entitles you to reproduce these pages as needed for your own classroom use only. Otherwise, no part of this book may be reproduced or utilized in any way or by any means, electronic or mechanical, including photocopying, recording, or information storage or retrieval system, without prior written permission from the publisher. Individual copies may not be distributed in any other form.

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

LEGO®, the LEGO® logo, and the Brick and Knob configurations are trademarks of the LEGO® Group, which does not sponsor, authorize, or endorse this book. All information and visual representations in this publication have been collected and interpreted by its author and do not represent the opinion of the LEGO® Group.

ORDERING INFORMATION

Quantity sales

Special discounts for schools are available for quantity purchases of physical books and digital downloads. For information, contact Brigantine Media at the address shown above or visit www.compasspublishing.org.

Individual sales

Brigantine Media/Compass Publishing publications are available through most booksellers. They can also be ordered directly from the publisher.
Phone: 802-751-8802 | Fax: 802-751-8804
www.compasspublishing.org
ISBN 978-1-9384065-5-3