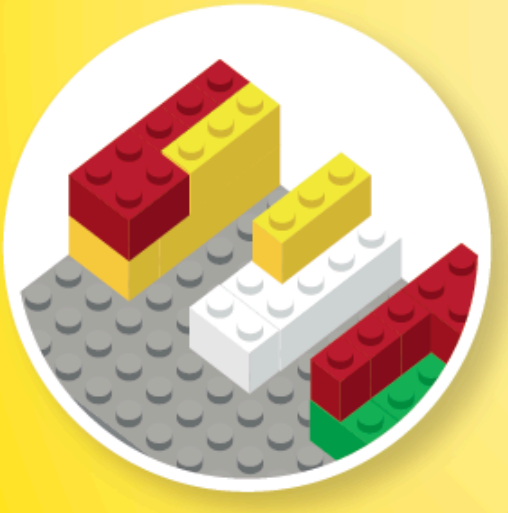
Brick Math Series

TEACHING SUBTRACTION USING LEGO® BRICKS



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Math Curriculum Expert

Teaching Subtraction Using LEGO® Bricks

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- **Suggested Brick Inventory**
- **Student Assessment Chart**
- **Baseplate Paper**

7

SUGGESTED BRICKS

Size	Number
1x1	10 each of 4 colors
1x2	6
1x3	6
1x4	6
1x10	6
2x2	6
2x3	6
2x4	6

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

START UNKNOWN PROBLEMS WITHIN 20

Students will learn/discover:

- How to solve subtraction problems where the starting number in the problem is unknown
- How to write mathematical equations for models

Why is this important?

Understanding subtraction problems with missing terms in different locations is important for students to make sense of the part-part-whole relationships between numbers. Having the unknown term at the start of the subtraction problem requires some abstract thinking to determine the difference. This skill serves as a stepping stone to math skills that go beyond subtraction. It will become important later as students move into pre-algebra and begin to use equations with variables.

Vocabulary:

- Start Unknown: beginning number (minuend) in a subtraction problem is missing
- Minuend: Largest number (and usually the first number) in a subtraction problem; the number that the subtrahend is subtracting from
- Subtrahend: Smaller of two numbers (and usually the second number) in a subtraction problem; the number that is being subtracted from the minuend
- Difference: Solution to a subtraction problem
- Minus: Symbol in a subtraction problem
- Subtract: Move from the whole
- Take Away: Move from the whole

How to use the companion student book, *Learning Subtraction Using 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.

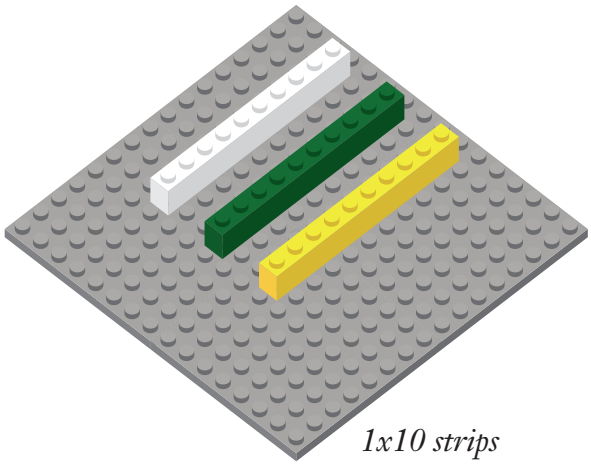
Part 1: Show Them How

Review of ten-frames:
If students have not used ten-frames recently, review the strategy at the start of Chapter 2.

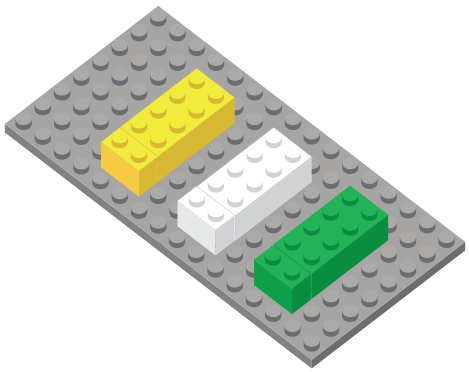
1. Problem: $\square - 3 = 7$

Ask students how to find the missing number (minuend) that belongs in the box.

Build three 1x10 strips or three ten-frames to represent the three numbers in the problem (*minuend*, *subtrahend*, and *difference*).

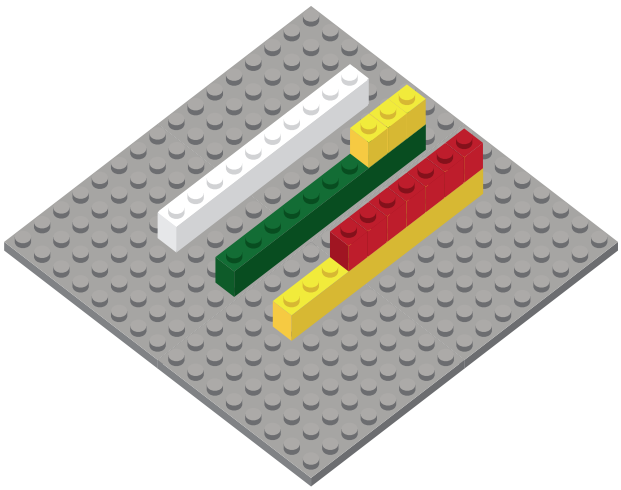


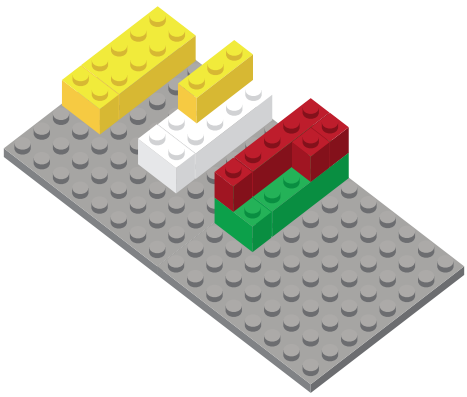
1x10 strips



ten-frames

2. Do not place any bricks on the left strip or ten-frame, since the box for the minuend in the math sentence is empty and still unknown. Place 3 studs on the center strip to represent the subtrahend 3 in the change location. Place 7 studs on right strip to represent the difference. Have students draw the model and write the math sentence it represents, which is $\square - 3 = 7$.

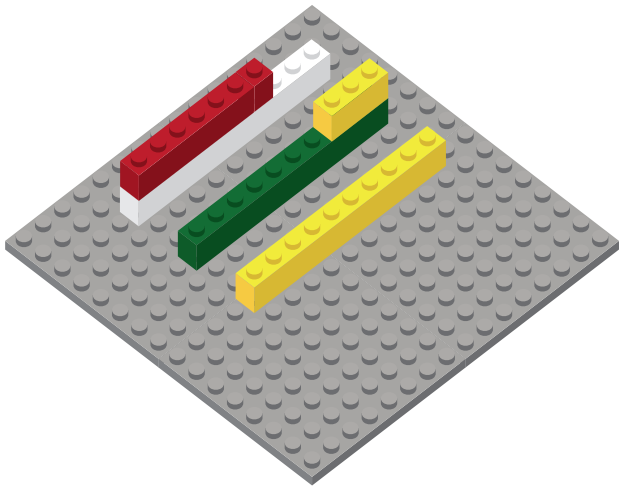


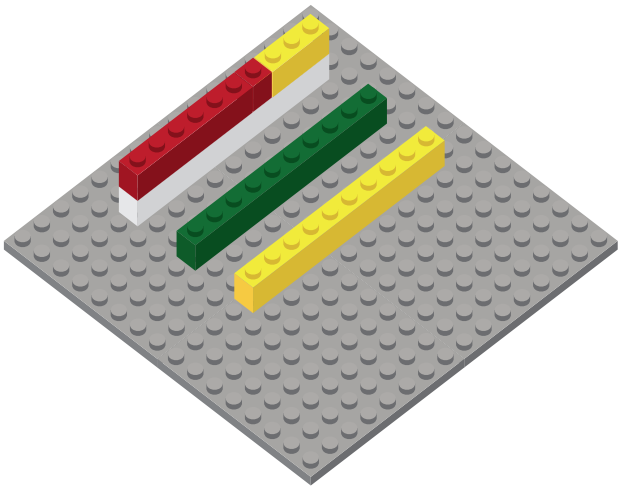


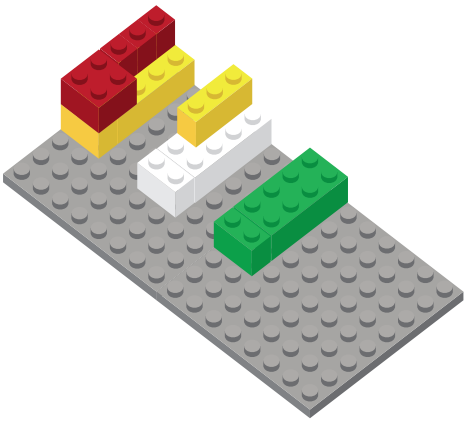
3. Ask students how to determine the starting number using subtraction strategies. Students could use strategies like counting up, one-to-one correspondence, part-part-whole, or matching to find the solution. Ask students if the start number should be larger or smaller than the difference, and help them understand why it should be larger.

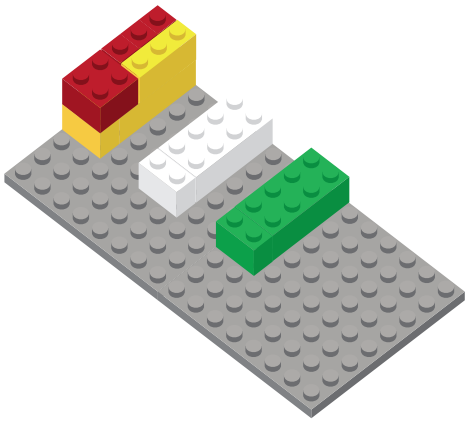
Use *working backwards* as the solving strategy. Tell students that taking the parts and putting them together is a way to find the whole.

Move the 7 studs from the right strip (*difference*) to the starting location (*minuend*). Fill in the missing studs on the minuend strip with the 3 studs from the center strip (*subtrahend*). The total number of studs on the first strip now represents the start number of 10.

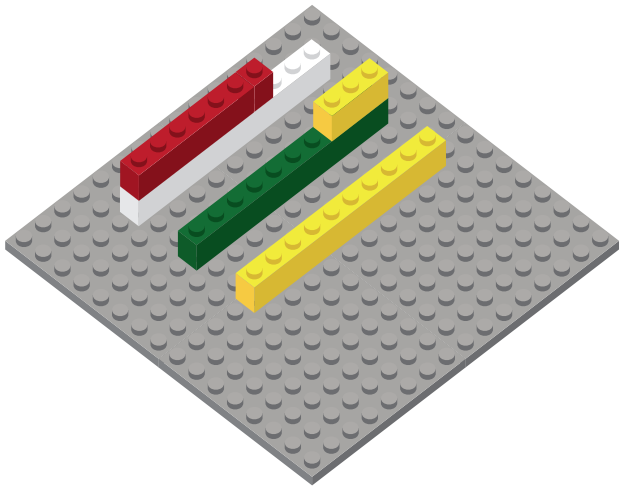


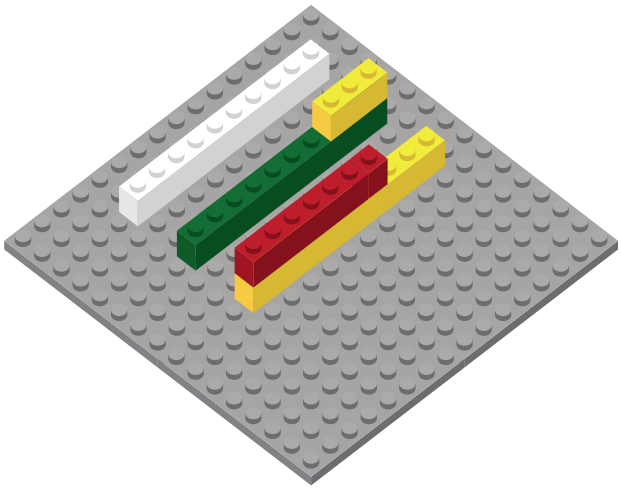


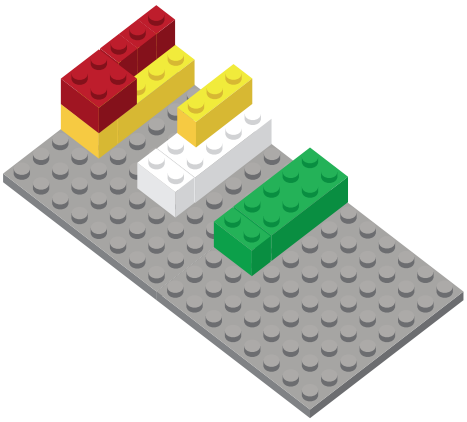


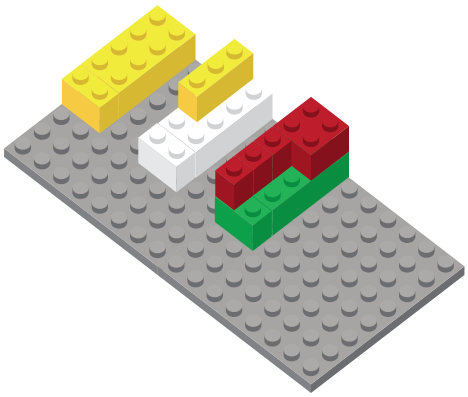


4. Show how to check this by taking 3 studs away from the 10 studs in the starting location and move them back to the center strip. Move 7 studs from the starting location to the difference location (the right strip). If the starting strip is now empty, the solution is correct.









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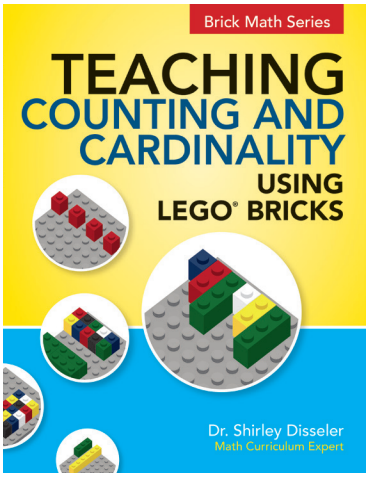
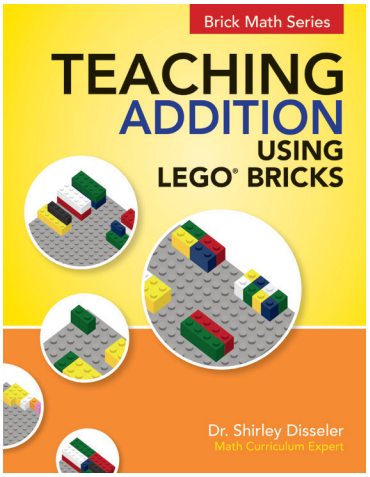
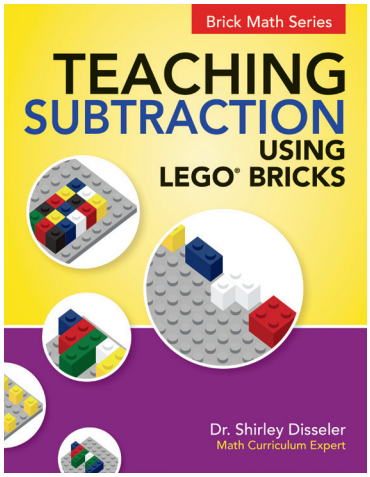
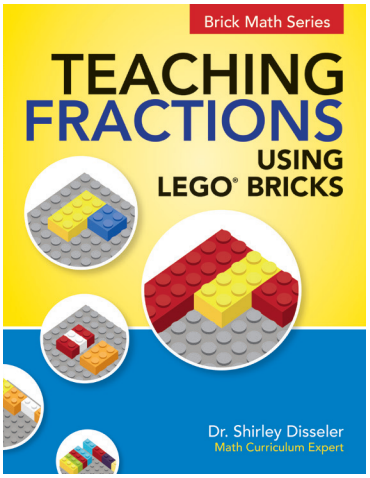
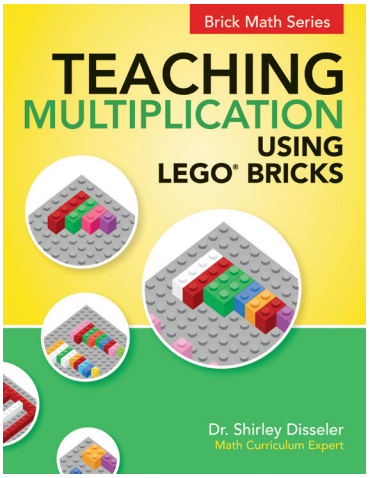
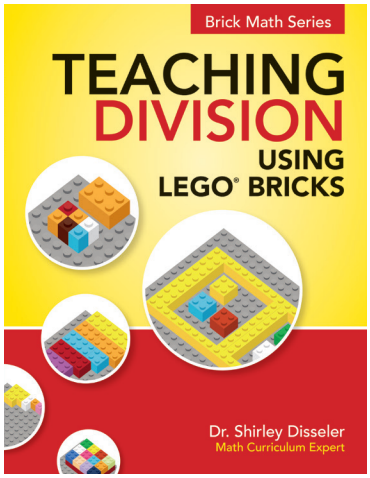


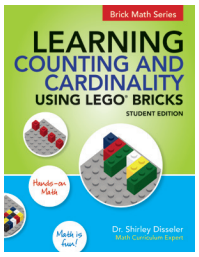
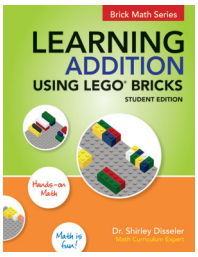
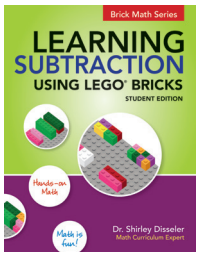
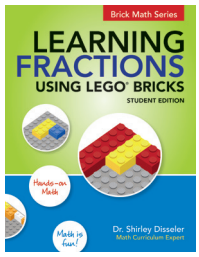
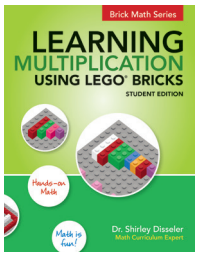
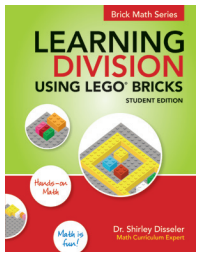










Companion Student Editions

Individual student books that follow the teaching curriculum, complete with additional activities for practice and assessments.