

Subtraction Using LEGO® Bricks
Chapter Assessments
Answer Key

Chapter 1

1. $12 - 5 = 7$ Minuend is 12

2. $7 - 5 = 2$ Subtrahend is 5

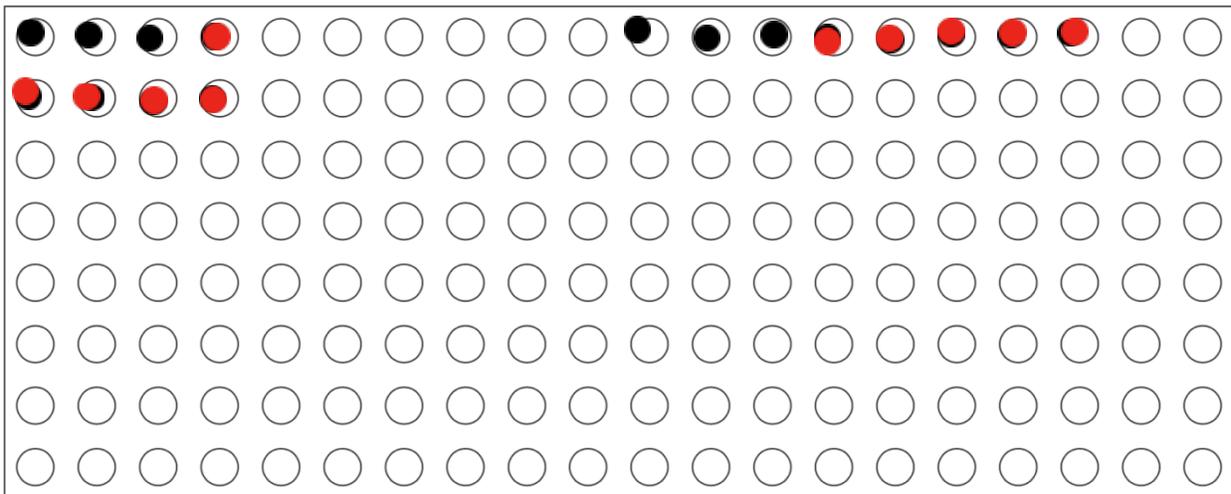
3. $12 - 7 = 5$ Difference is 5

4. $8 - 5 = \underline{\quad}$

Two different models, each one showing a correct solution to the problem:

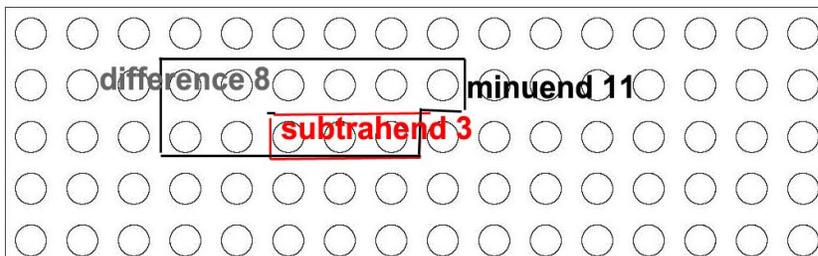
Both models show 8 black studs on the lower level and 5 red studs stacked on top of the 8, leaving 3 black studs uncovered. The left model is in a 2x4 configuration; the right model is in a 1x8 configuration.

$8 - 5 = 3$



5. $11 - 3 = 8$

Drawing outlines 11 black studs (minuend of 11) on the lower level and 3 red studs (subtrahend of 3) on top of the 11 black studs, leaving 8 black studs uncovered (difference of 8).

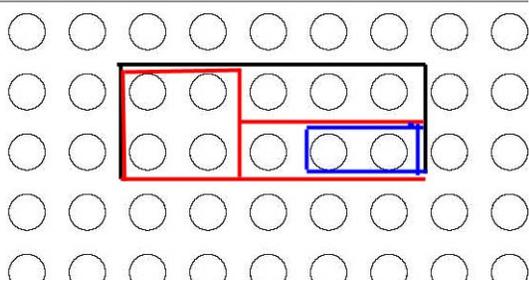


Chapter 2

1. $7 - 2$

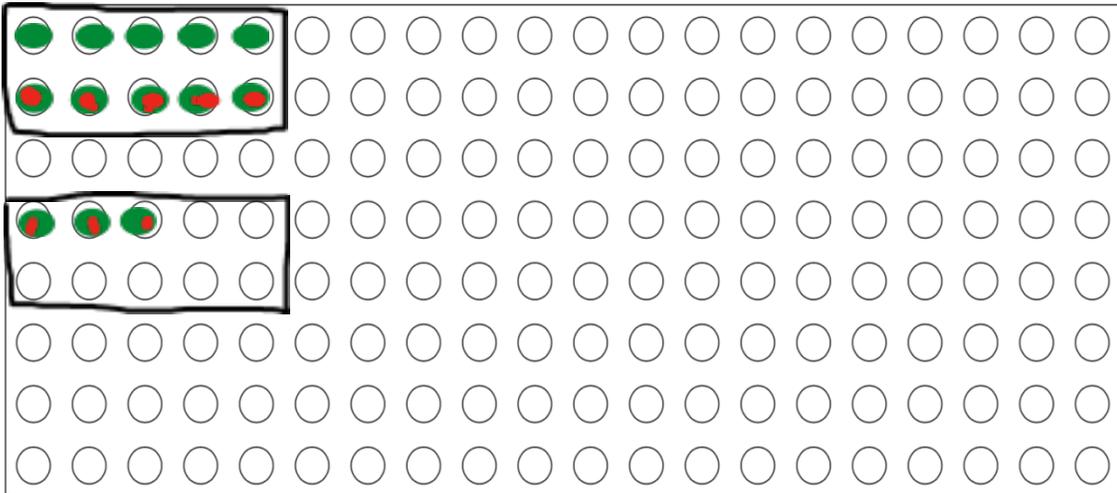
7 is minuend; 2 is subtrahend

Black outlines a ten-frame. Red outlines 7 red studs (the minuend of 7). Blue outlines 2 blue studs (the subtrahend of 2), placed on top of the red bricks. The difference of 5 is shown by the 5 red studs left uncovered.



2. The 12 orange bricks represent the minuend in the model.

3. The model shows the minuend of 13 as 13 green studs on two ten-frames (10 studs on one ten-frame and 3 studs on a second ten-frame). The subtrahend of 8 is shown as 8 red studs stacked on top of the 13 green studs. The difference is shown by the 5 green studs left uncovered. The *difference* is 5.



4. $12 - 7 = 5$

Which number is the *minuend*? 12

Which number is the *difference*? 5

Which number is the *subtrahend*? 7

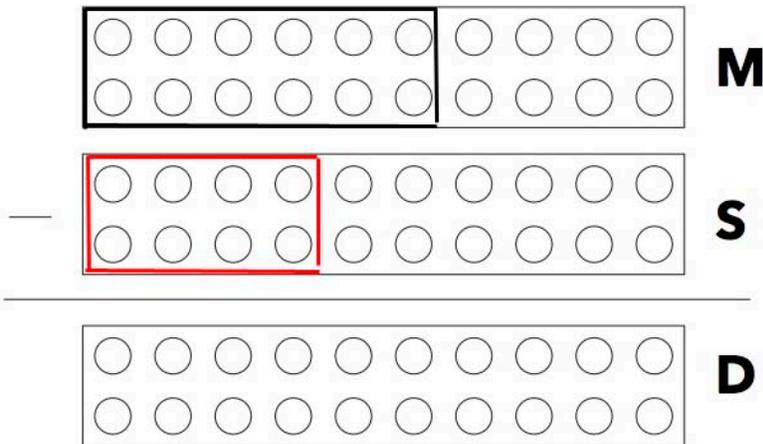
Chapter 3

1. $12 - 8 = \underline{\quad}$

The minuend of 12 is shown as 12 studs (2x6 brick) outlined in black on the M diagram.

The subtrahend of 8 is shown as 8 studs (2x4 brick) outlined in red on the S diagram.

The D diagram is blank to show that the difference is the missing term.

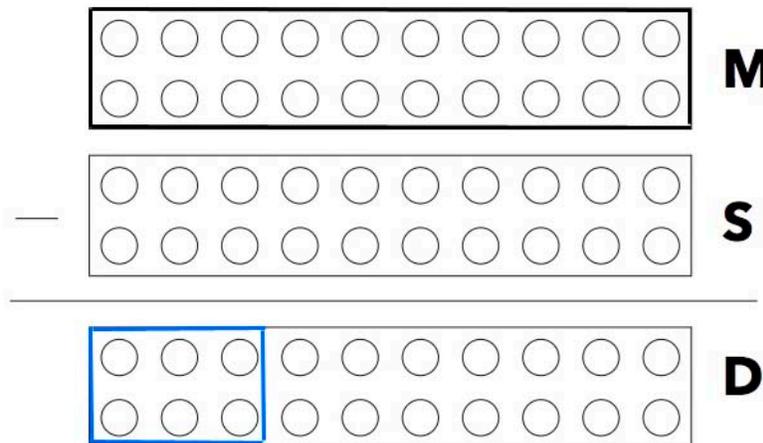


2. $20 - \underline{\quad} = 6$

The minuend of 20 is shown as 20 studs (2x10 brick) outlined in black on the M diagram.

The S diagram is blank to show that the subtrahend is the missing term.

The difference of 6 is shown as 6 studs (2x3 brick) outlined in blue on the D diagram.

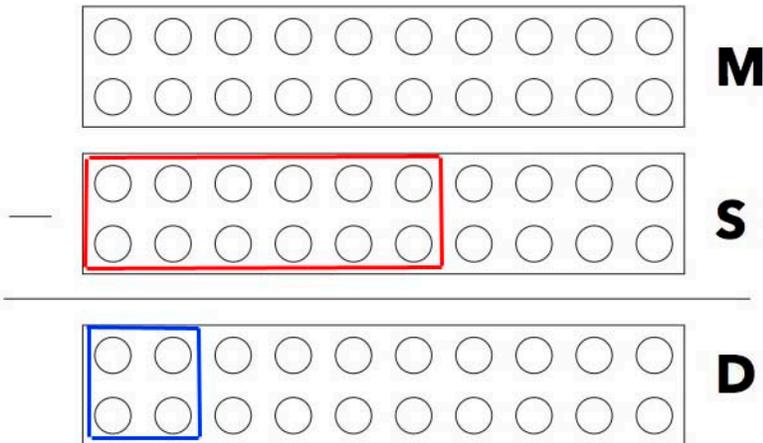


3. $\underline{\quad} - 12 = 4$

The M diagram is blank to show that the minuend is the missing term.

The subtrahend of 12 is shown as 12 studs (2x6 brick) outlined in black on the S diagram.

The difference of 4 is shown as 4 studs (2x2 brick) outlined in blue on the D diagram.



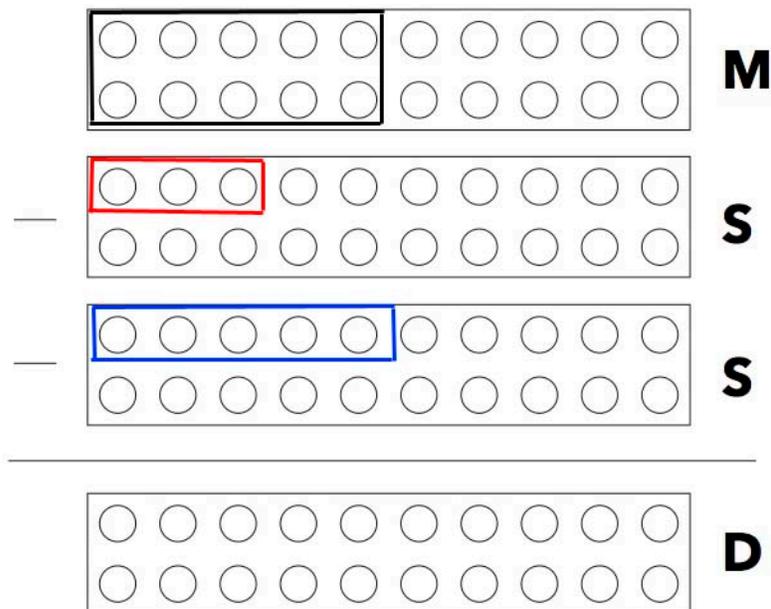
4. $10 - 3 - 5 = \underline{\quad}$

The minuend of 10 is shown as 10 black studs.

The subtrahend of 3 is shown as 3 red studs.

The subtrahend of 5 is shown as 5 blue studs.

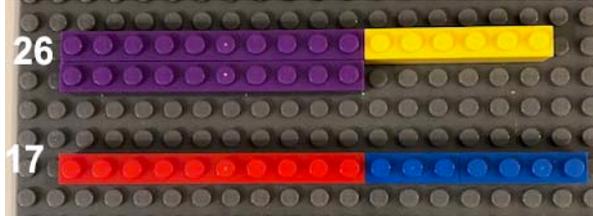
The D diagram is blank to show that the difference is the missing term.



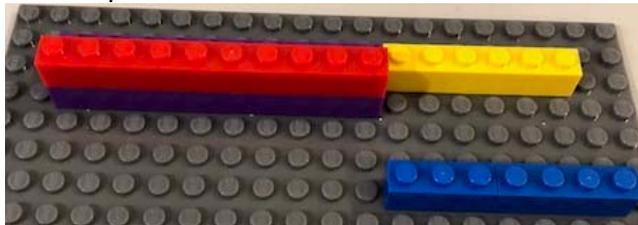
Chapter 4

1. $26 - 17$

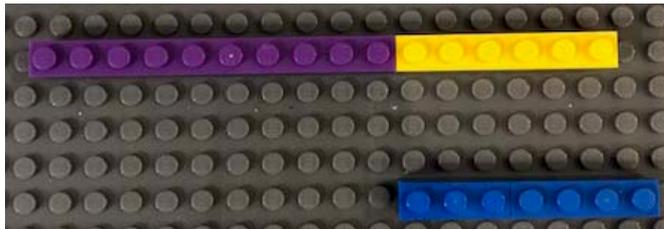
Model the problem:



Match up the tens



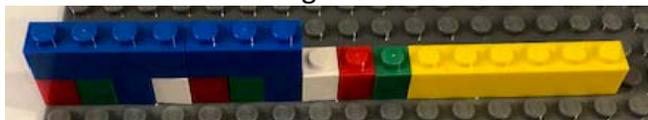
Remove the tens to leave one 10 and 6 ones minus 7 ones



Since 7 is larger than 6, decompose the 10 into 10 ones



Stack the bricks showing the subtrahend of 7 on top of the minuend of 16

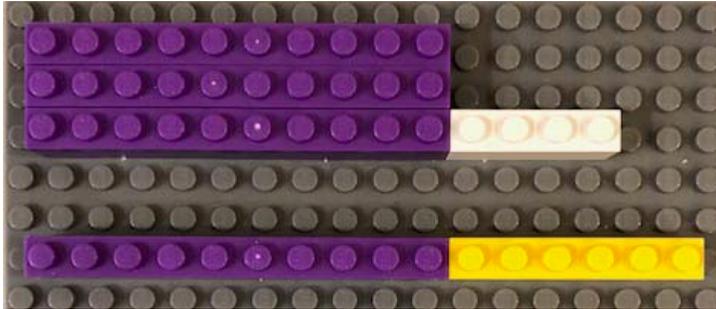


Remove the matching bricks to show the solution: the difference of 9 or $27 - 16 = 9$

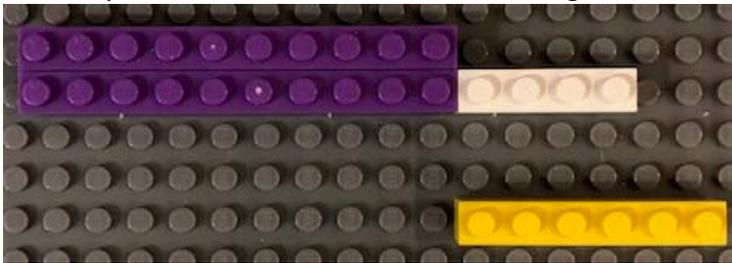


2. $34 - 16 = \underline{\hspace{2cm}}$

Model the problem:



Match up the tens and remove them, leaving $24 - 6$



Since 6 is greater than 4, decompose one of the tens into ones



Stack the 6 bricks showing the subtrahend on top of the 24 bricks showing the minuend of 24



Remove the matching bricks to show the bricks 18 left uncovered

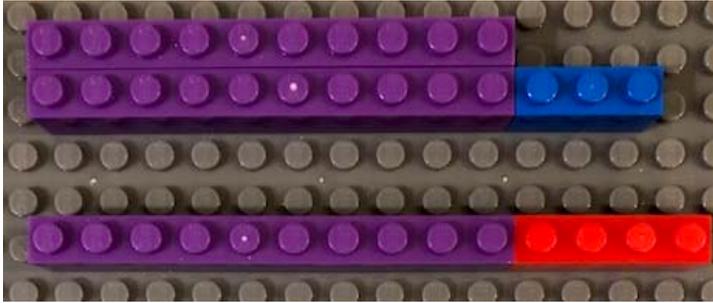
The difference is 18

$34 - 16 = 18$



3. $23 - 14$

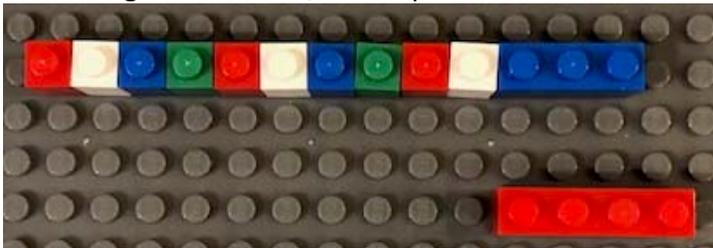
Model the problem:



Match up the tens and remove them, leaving $13 - 4$



Since 4 is greater than 3, decompose the ten into ones



Stack the bricks showing the subtrahend of 4 on top of the bricks showing the minuend of 13



Remove the matching bricks to show the 9 bricks left uncovered

The difference is 9

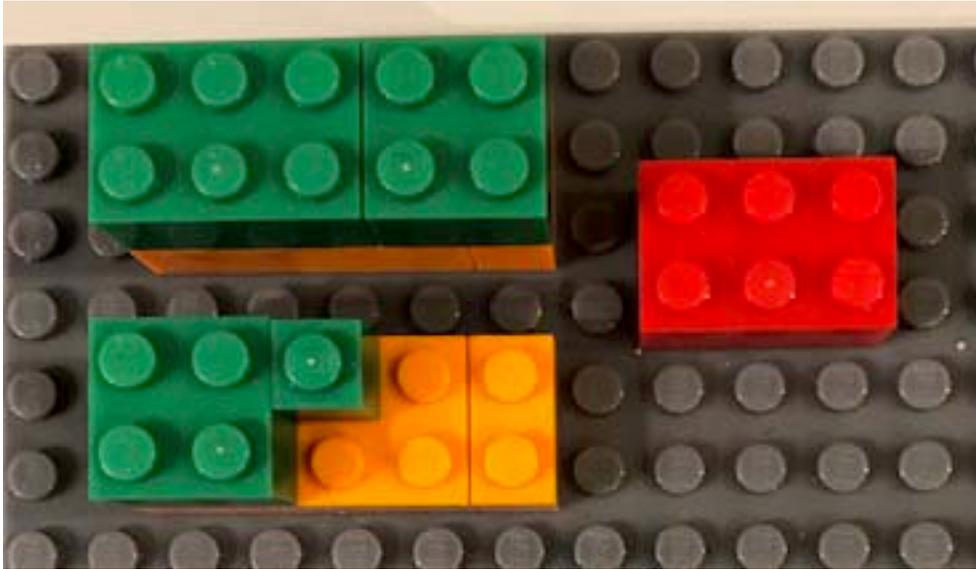
$$23 - 14 = 9$$



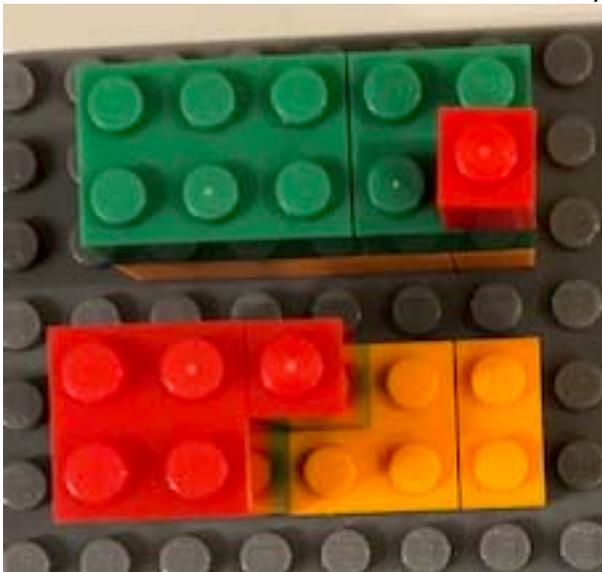
Chapter 5

1. $15 - 6 = \underline{\quad}$

This model of problem uses ten-frames (can also be modeled with 1x10 strips).
15 green studs model the minuend and 6 red studs model the subtrahend.



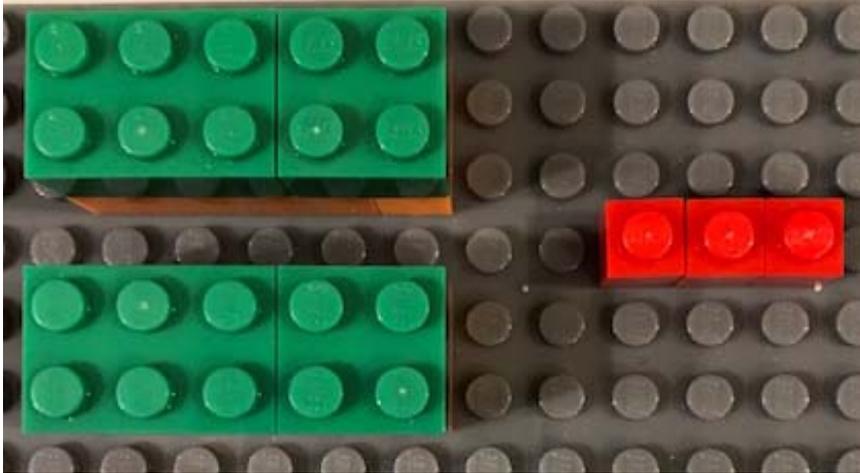
Stack red bricks showing subtrahend of 6 on top of green bricks on ten-frames showing minuend of 15. The difference of 9 is shown by the 9 green studs left uncovered.



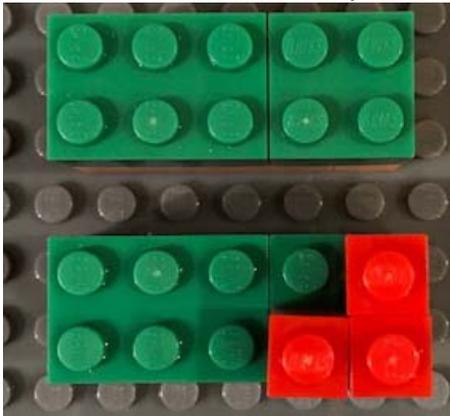
2. $20 - 3 = \underline{\hspace{2cm}}$

Model of problem:

20 green studs on two ten-frames model the minuend of 20. 3 red studs model the subtrahend of 3.



Stack the 3 red studs (subtrahend of 3) on top of the 20 green studs (minuend of 20). The difference of 17 is shown by the 17 green studs left uncovered.



3. Math sentences that are not correct:

$15 - 6 = 8$

$14 - 9 = 6$

4. Correct solutions:

$15 - 6 = 9$ If you decompose 15 into 15 ones and match up 6 studs on top of the 15, there are 9 studs left uncovered.

$14 - 9 = 5$ If you decompose 14 into 14 ones and match up 9 studs on top of the 14, there are 5 studs left uncovered.

Chapter 6

1. $12 - 5 = 7$

12 is the **minuend**.

5 is the **subtrahend**.

7 is the **difference**.

2. $10 - 2 = 8$

10 is the **minuend**.

2 is the **subtrahend**.

8 is the **difference**.

3. $9 - \underline{\quad} = 3$

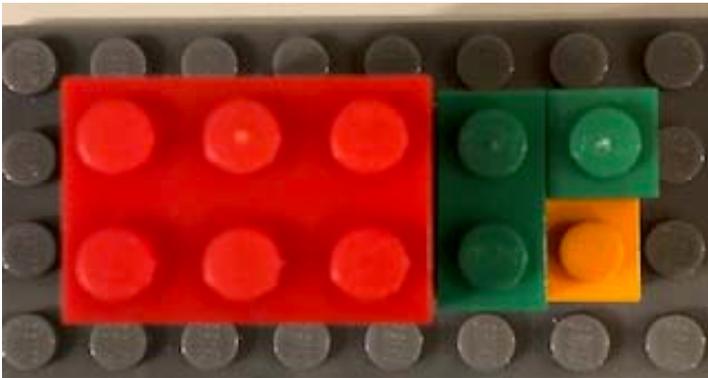
Modeled using ten-frames:

Model nine studs on a ten-frame



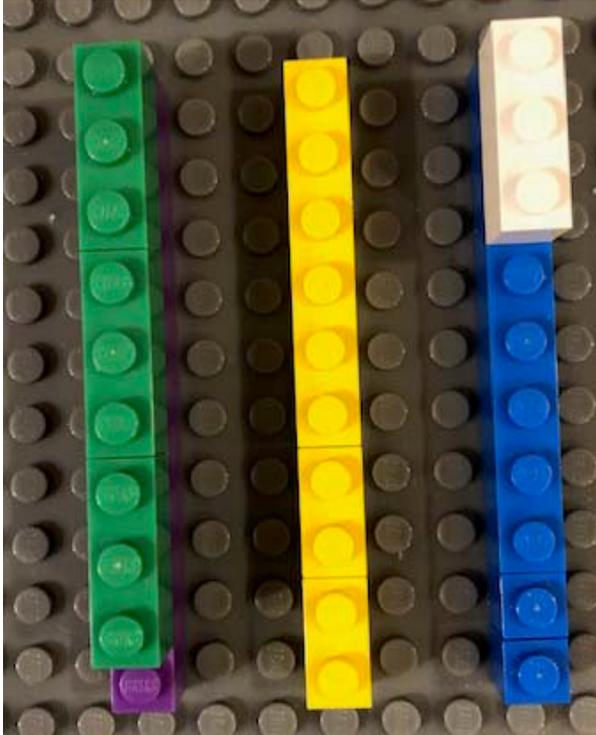
Add studs on top of minuend studs until 3 studs are left uncovered. The red studs show the change unknown number of 6.

$9 - 6 = 3$

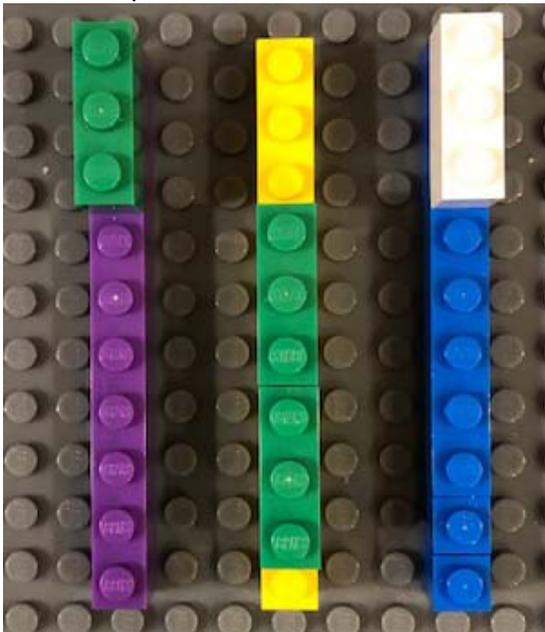


Or modeled using three 1x10 strips:

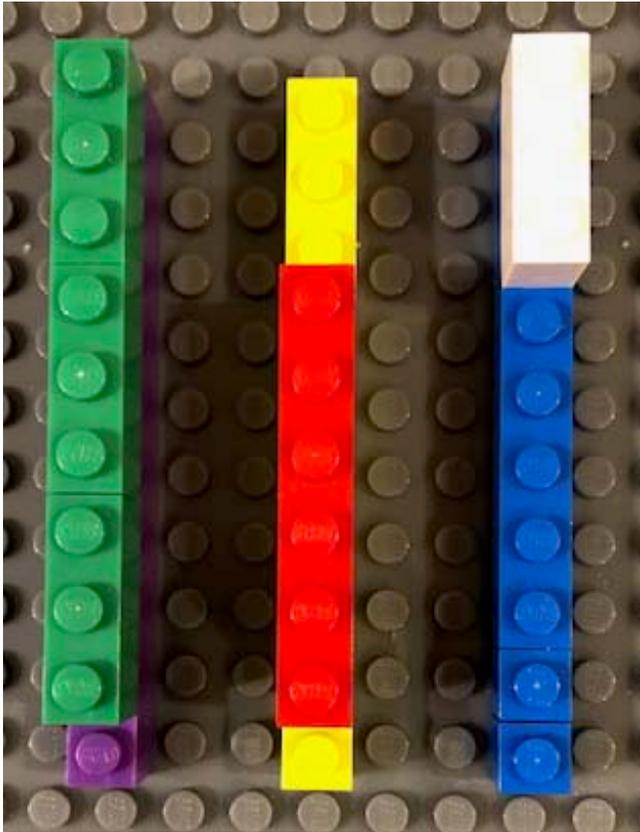
9 studs on left strip, no studs on center strip, 3 studs on right strip



Take enough studs off the left strip to match the left and right strips. Put those studs on the center strip.



Model the completed problem: $9 - 6 = 3$

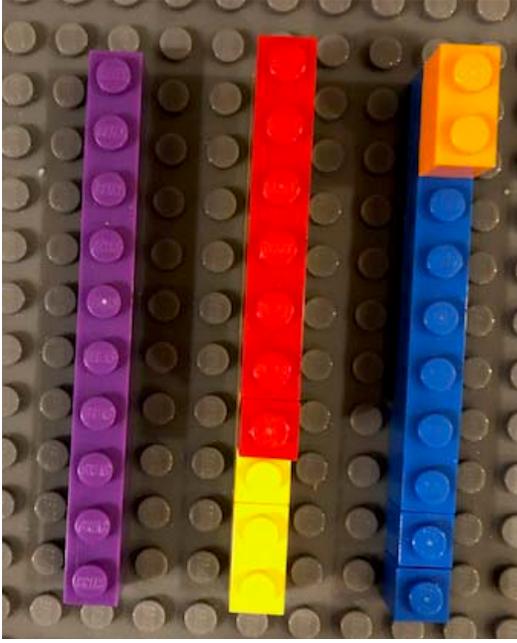


Chapter 7

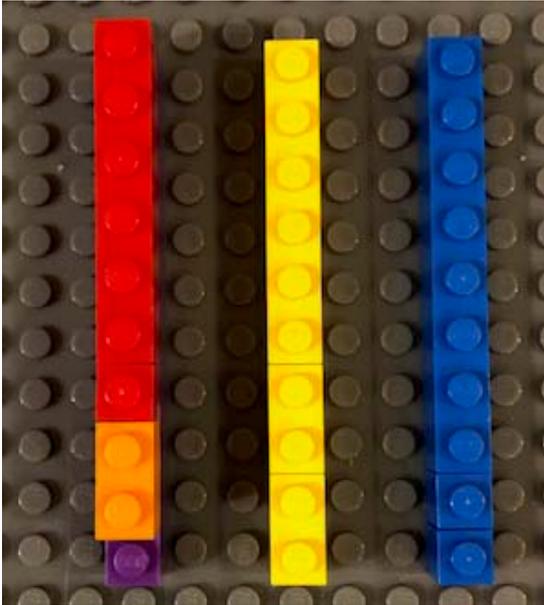
1. $\underline{\quad} - 7 = 2$

Model the problem:

No studs on the left strip, 7 studs on the center strip, 2 studs on the right strip

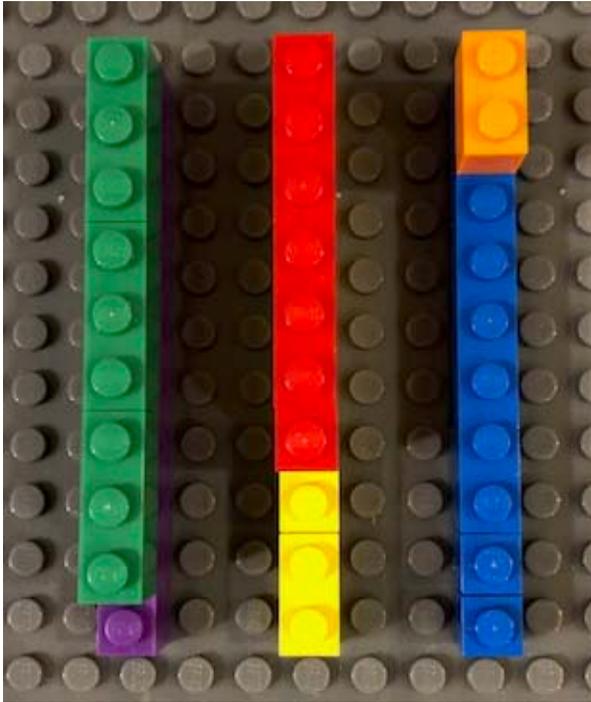


Take the studs off the center and right strip, and stack them on top of the left strip. There are now 9 studs on the left strip, so 9 is the solution.



Model all three parts of the problem:

$$9 - 7 = 2$$

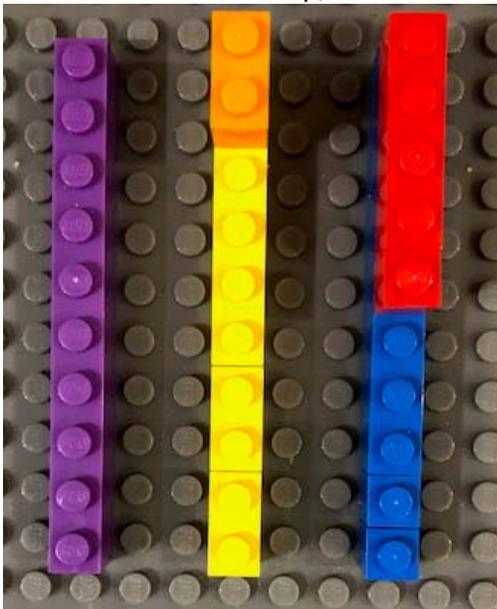


2. Students create their own problems, so solutions will vary

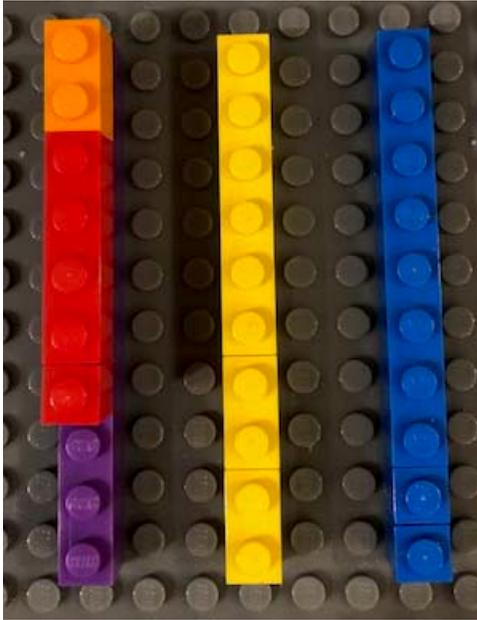
3. $\underline{\quad} - 2 = 5$

Model the problem:

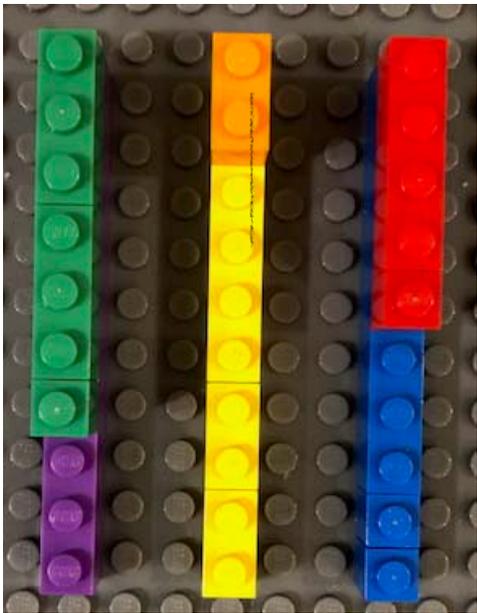
No studs on the left strip, 2 studs on the center strip, 5 studs on the right strip



Take the studs off the center and right strip, and stack them on top of the left strip. There are now 7 studs on the left strip, so 7 is the solution.



Model all three parts of the problem:
 $7 - 2 = 5$



4. (Start numbers in red)

$$6 - 4 = 2$$

$$12 - 5 = 7$$

$$22 - 16 = 6$$