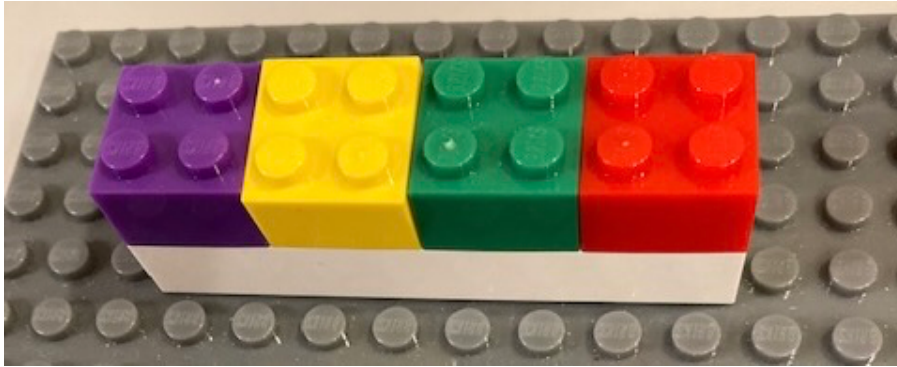**Brick Math *Division***
Answer Key for Chapter Assessments

Chapter 1

1. "To divide" means to put things into equal groups. Any leftovers are a fraction of the whole.

2. Models may vary. A possible solution:

In this model, the 2x8 brick has 16 studs. Each 2x2 brick stacked on top shows that there are 4 sets of 4. This shows the equation $16 \div 4 = 4$

Chapter 2

1. Factors are the numbers that you multiply together to get another number. For example, factors of 12 include: 1, 12; 3, 4; 2, 6

2. Factors are used in division to show how many ways a set can be split into equal groups.

3.
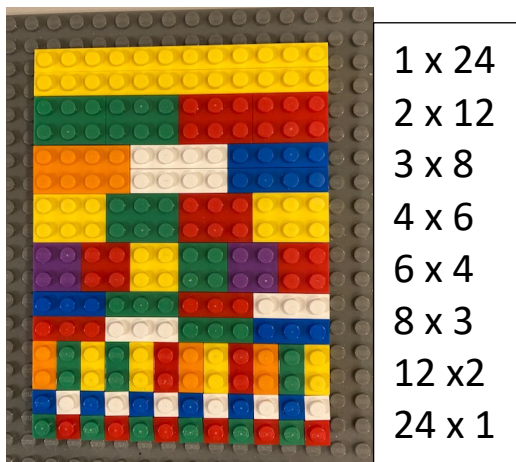
1 x 24
2 x 12
3 x 8
4 x 6
6 x 4
8 x 3
12 x2
24 x 1

Each color represents a set within the problem. The sets are divided evenly to show equal groups. 6 x 4, for example, looks different than 4 x 6, even though all the products are the same.
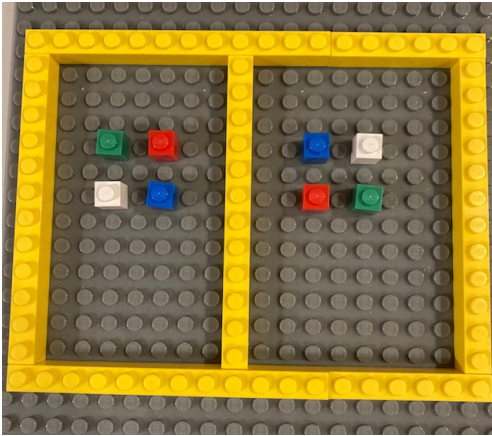
Chapter 3

1. divisor (highlighted):
 12 ÷ 4 = 3
 20 ÷ 5 = 4

2. dividend (highlighted):
 12 ÷ 3 = 4
 20 ÷ 5 = 4

3. 8 ÷ 2

The model shows 8 studs evenly divided into 2 groups. There are 4 studs in each group, so the answer is 8 ÷ 2 = 4.
Multiplication sentence: 2 x 4 = 8

4.

Number of Studs	Number removed	Number left
8	2	6
6	2	4
4	2	2
2	2	0

5. Repeated subtraction represents the removal of equal groups (the same amount each time). Division represents the placing of items into equal groups. If you subtract equal amounts, you will end up with the number of groups that you get when you divide and the same number in each group.
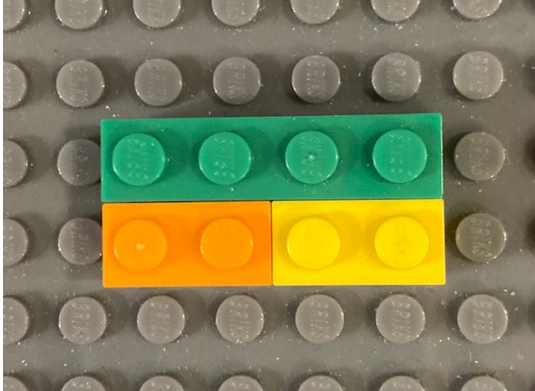
6. Multiplication is the opposite of division.

Chapter 4

1. Sharing something equally means to put the same amount in each group.

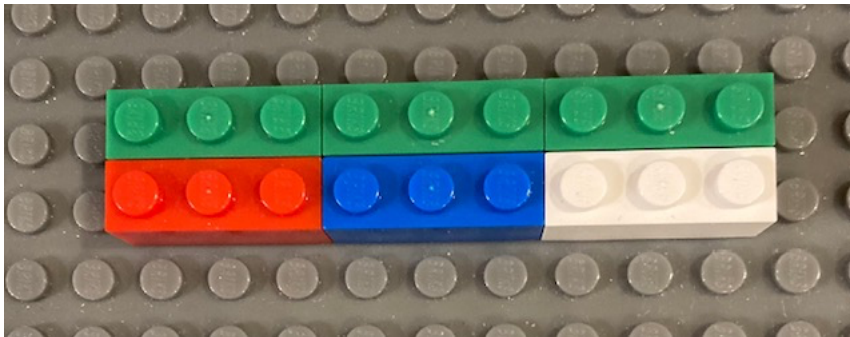2. To partition is to take the whole and divide it into equal parts.

3.

The 4 green studs represent 4 candy bars.
The orange studs represent one friend's portion, and the yellow studs represent the other friend's portion. This shows that each friend gets 2 candy bars.

4.

The green studs represent 9 candy bars.
The red studs represent one friend's portion, the blue studs represent the second friend's portion, and the white studs represent the third friend's portion. Each friend gets 3 candy bars because it takes 3 of each color to make 9.
$9 \div 3 = 3$

Chapter 5

1. Repeated subtraction represents the removal of equal groups (the same amount each time). Division represents the placing of items into equal groups. If you subtract equal amounts, you will end up with the number of groups that you get when you divide with the same number in each group.
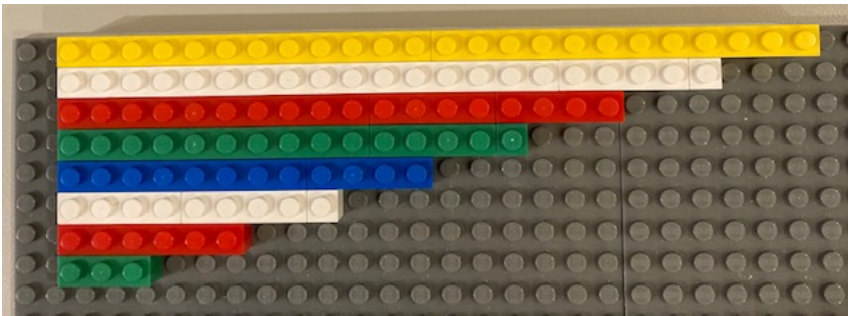
2.
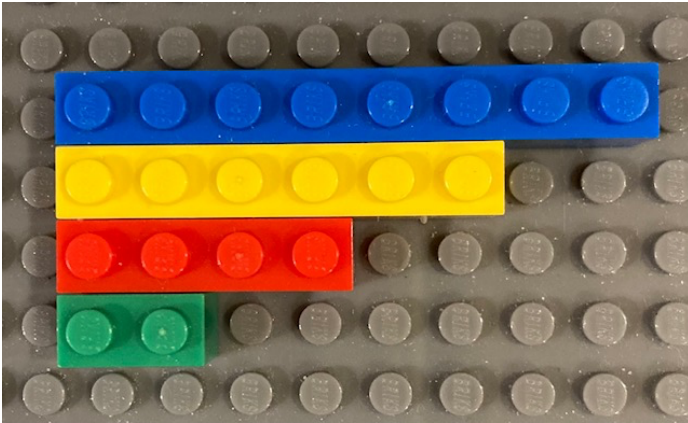
The 8 blue studs represent 8 feet of rope. Repeated subtraction of 2 each time is shown with the 6 yellow studs, then 4 red studs, then 2 green studs. The 4 different colors show that 8 ÷ 2 = 4, or that an 8-foot rope can be divided into 4 pieces of rope that are each 2 feet long.

3. 24 ÷ 3 = 8

4.

The yellow bricks represent the starting number of 24. Each step shows subtracting 3 from the group above it. There are 8 rounds of repeated subtraction.

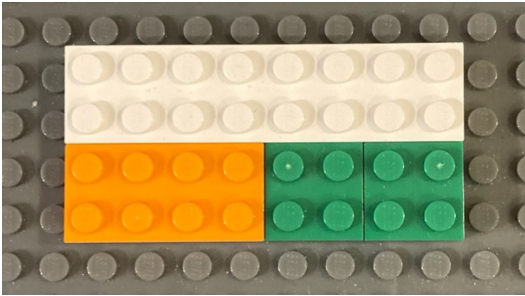## Chapter 6

1. Quotient: 13 R1
   Divisor: 3
   Remainder: 1
   Dividend: 40

2. A remainder is the leftover part after the dividend or total amount has been partitioned into equal groups. It can be represented as a fraction or a decimal.
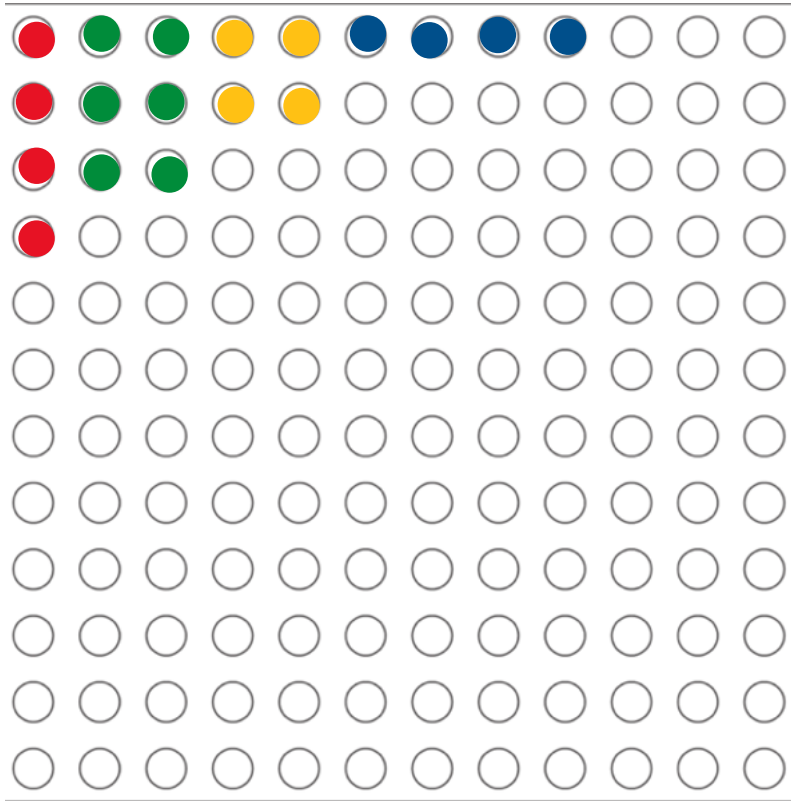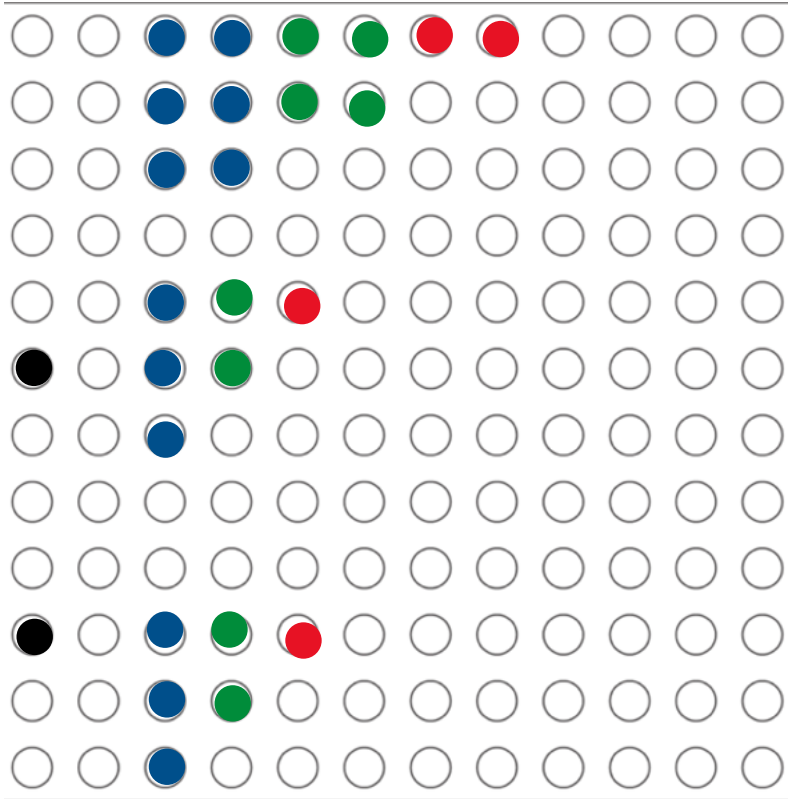
3.

The dividend of 16 is shown by the white studs. Since the divisor is 2, the studs are broken into 2 equal groups, shown by the orange and the green studs. There are 8 studs in each of those groups, so the quotient is 8.

Chapter 7

1. 1,224

2.   222 ÷ 2

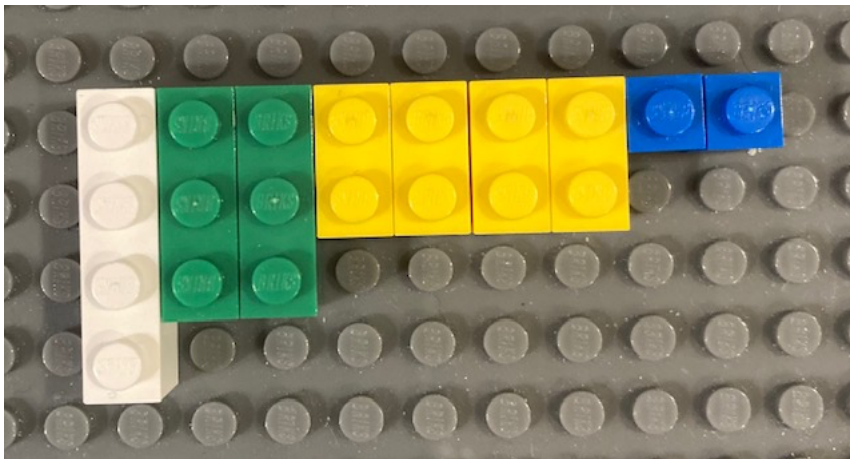Two 1 x 3 bricks = 200
Two 1 x 2 bricks = 20
Two 1 x 1 bricks = 2
222

Using set markers (white 1 x 1 bricks shown here in black), partition 222 into two equal sets.
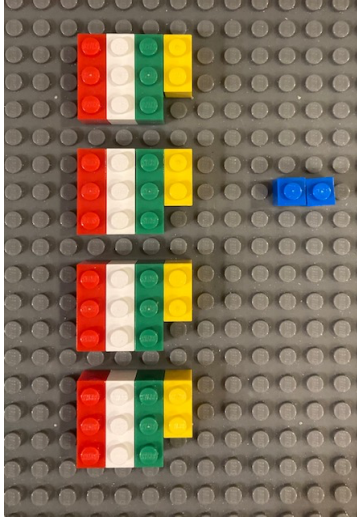
Each set has 121 in it, so the quotient is 121 and there are no remainders.

3.   1242 ÷ 4

Begin by modeling the dividend 1242, using one 1x4 brick, two 1x3 bricks, four 1x2 bricks, and two 1x1 bricks.

To divide this number by 4 requires decomposing of the thousand into 10 hundreds. Then there are 12 hundreds in total, which can be divided into 4 equal groups. The tens can be divided into 4 groups evenly. There are 2 ones left over.

The quotient is 310 Remainder 2.