

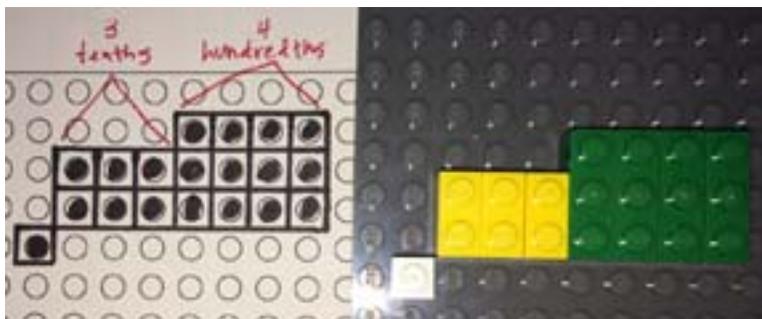
Brick Math
Decimals Using LEGO® Bricks
Student Assessments - Answer Key

Chapter 1

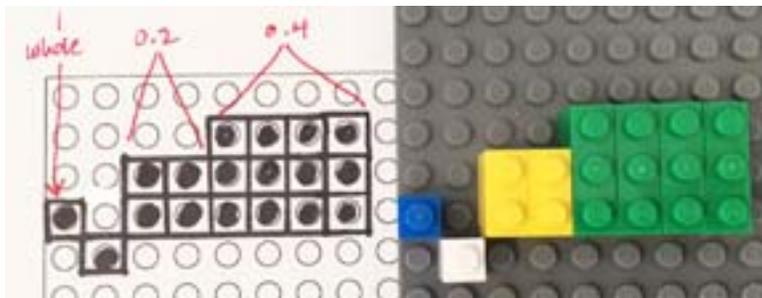
1. 0.21

2. 0.28

3.



4.



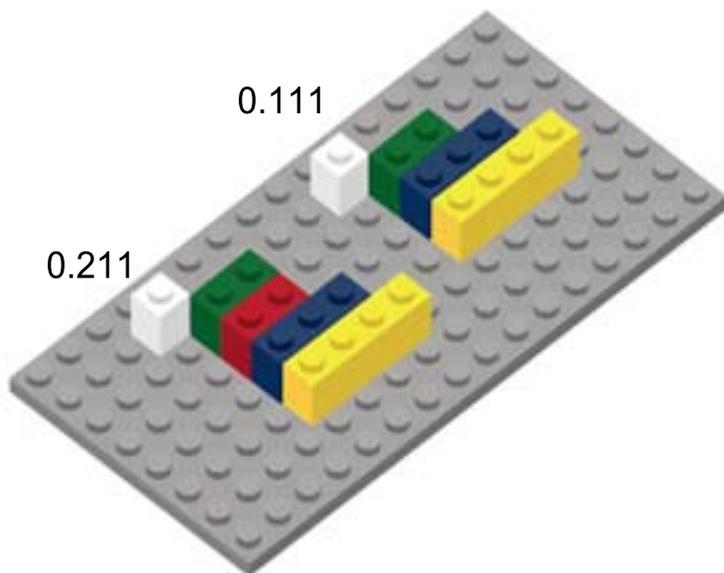
5. A decimal is similar to a fraction because they both represent part of a whole.

Chapter 2

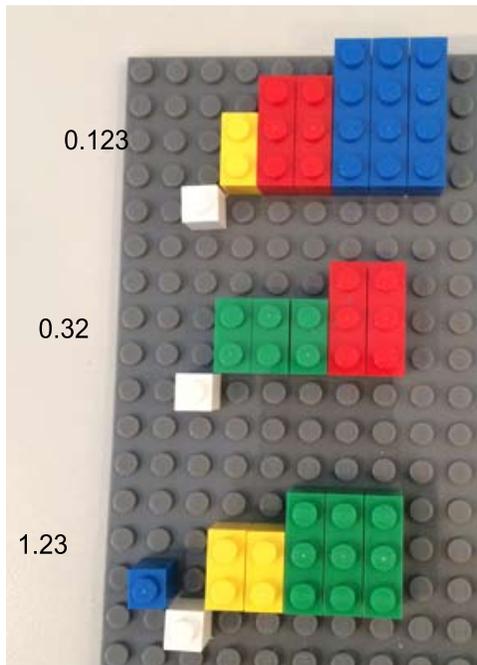
1. (C) 1.23 is the largest decimal. It contains a whole number 1. None of the other possible answers are larger than 1.0.

2. Math sentence: $0.211 > 0.111$

0.211 is larger because it has the greatest number in the largest place value location (tens).



3. Math sentence: $0.123 < 0.32 < 1.23$

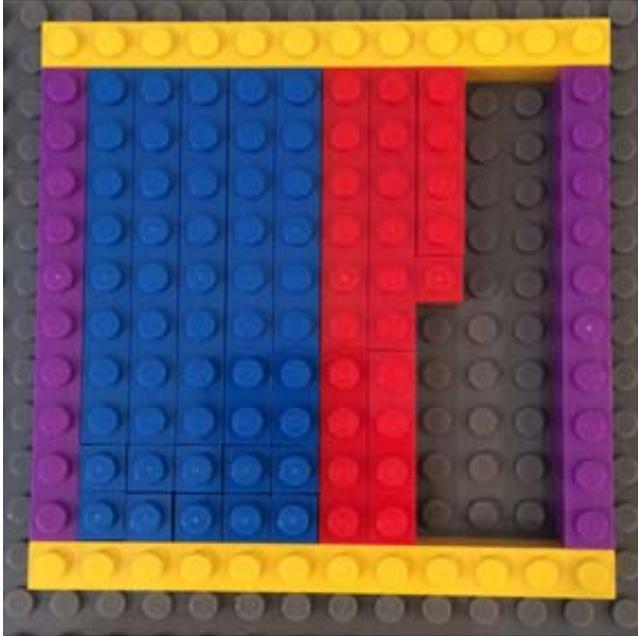


Chapter 3

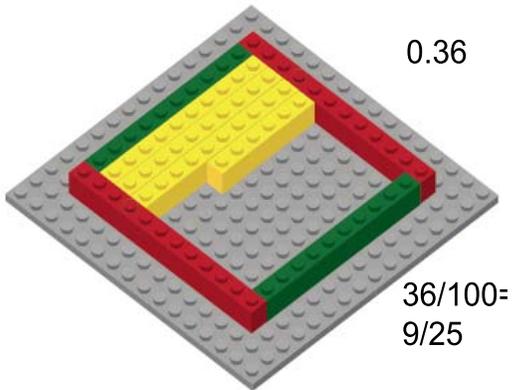
1. $.040 + 0.20 = 0.60$

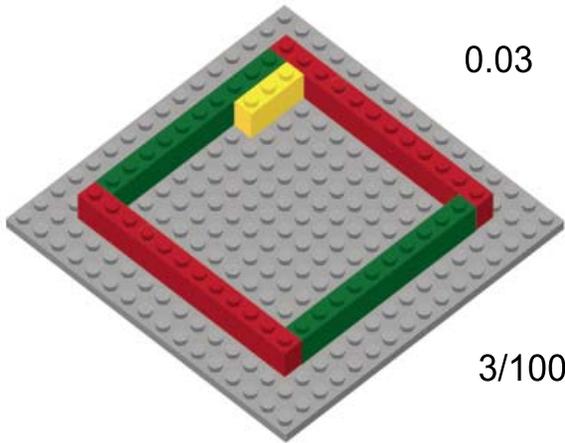
2. $\frac{1}{2} = 0.5$; $\frac{1}{4} = 0.25$

$0.5 + 0.25 = 0.75$



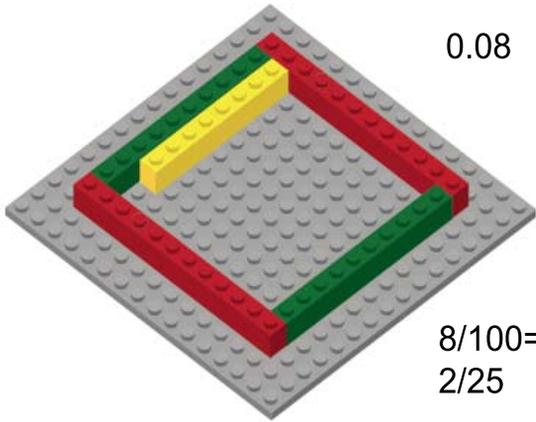
3.





0.03

$\frac{3}{100}$



0.08

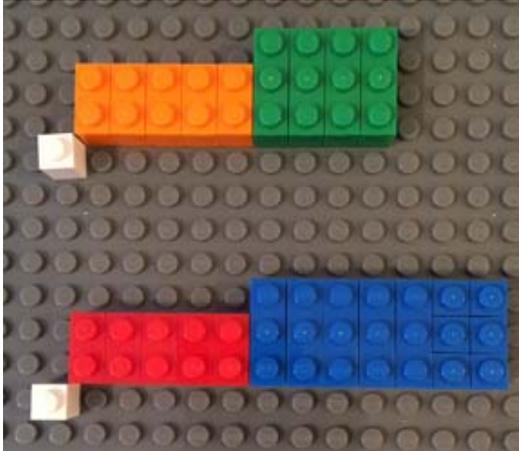
$\frac{8}{100} =$
 $\frac{2}{25}$

Chapter 4

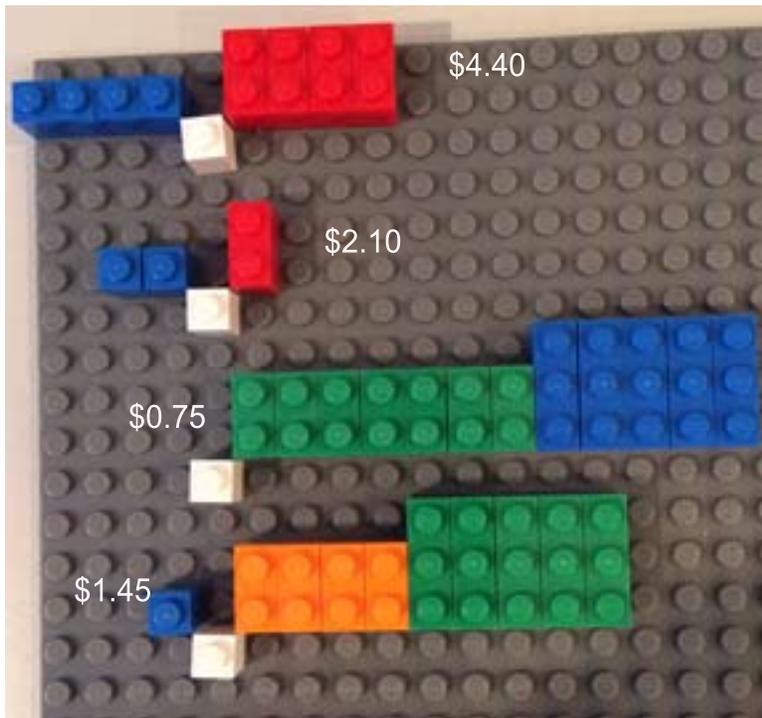
1. top model: 0.54

bottom model: 0.57

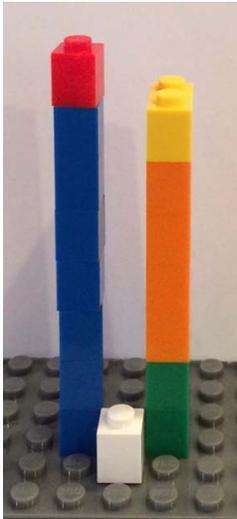
The models show that 0.54 is less than 0.57 because there are fewer bricks in the hundredths place in 0.54. Therefore, James ran faster.



2.

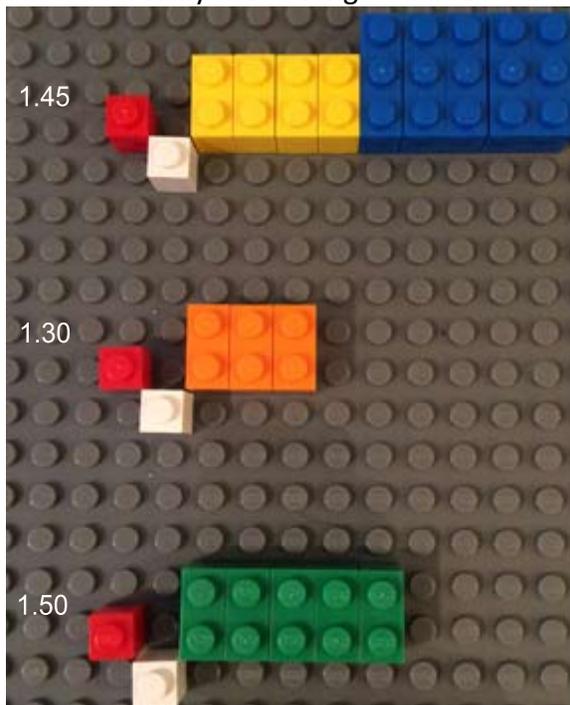


Sum: \$8.70



The model of the sum shows 10 tenths decomposed to 1 whole, and ten hundredths decomposed to 1 tenth.

3. The model shows Mark's time of 1 hour 45 minutes, Susan's time of 1 hour 30 minutes, and Kelly's time of 1 hour 50 minutes (longer than Mark's and Susan's times). *Note:* Any time modeled for Kelly that is longer than 1 hour 45 minutes is a correct answer.



Chapter 5

1. $1.45 - 0.23 = 1.22$

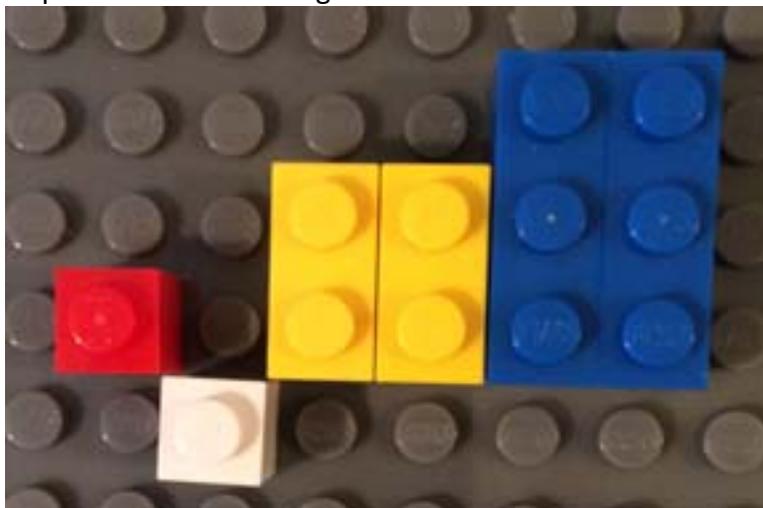
Step 1: Model the numbers



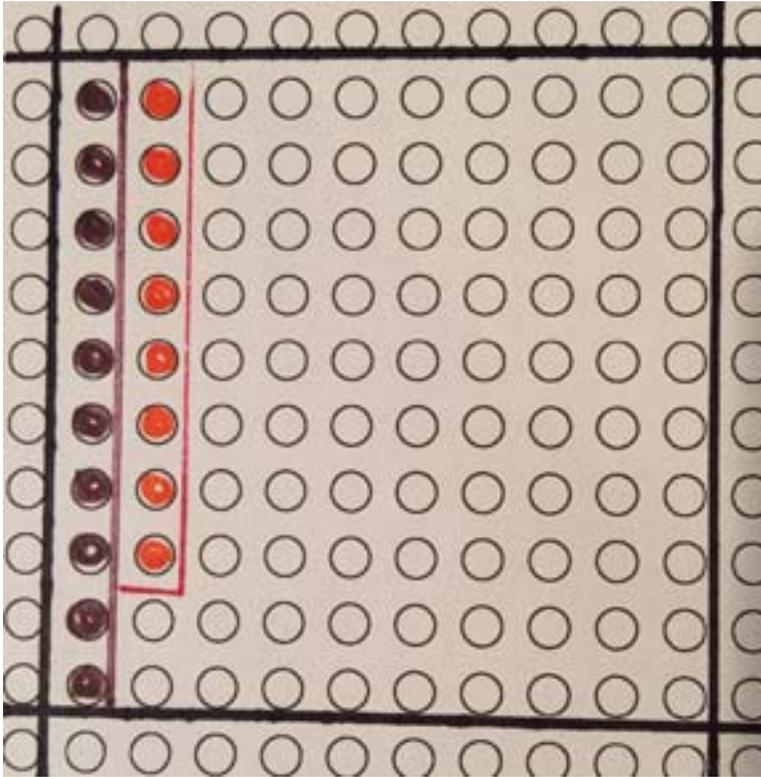
Step 2: Match minuend bricks with subtrahend bricks



Step 3: Remove matching bricks to show difference of 0.22

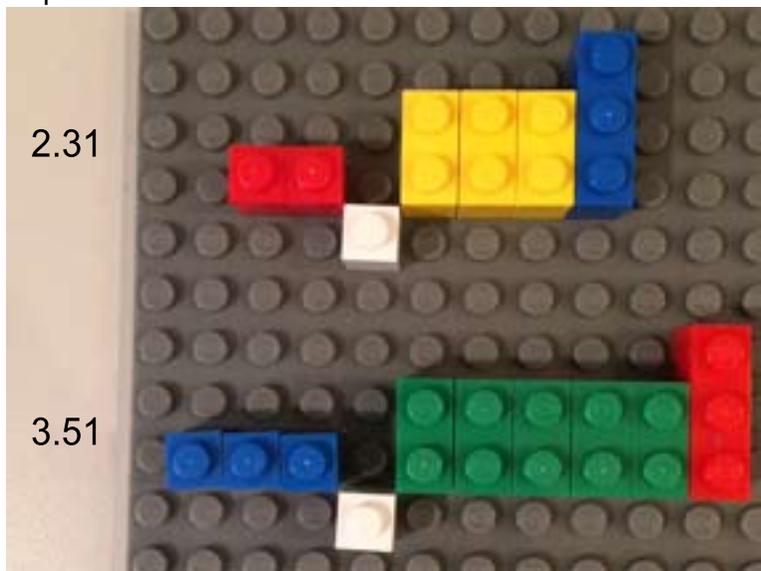


2. Note: Many different answers are correct, as long as the two addends add to a sum of 0.18.
For example, $0.10 + 0.08 = 0.18$ (shown in drawing) or $0.09 + 0.09 = 0.18$

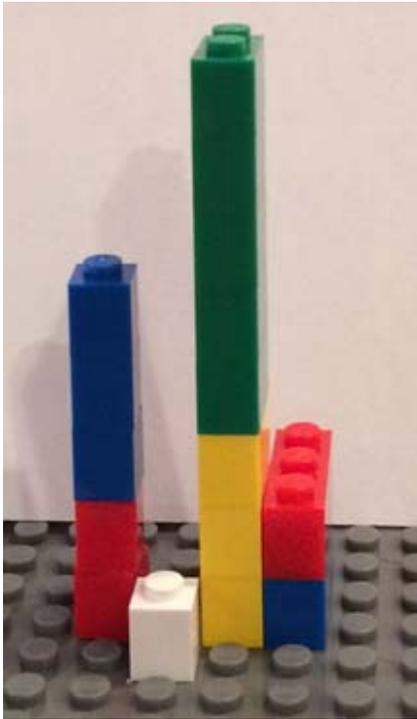


3. $2.31 + 3.51 = 5.82$

Step 1: Model the addends



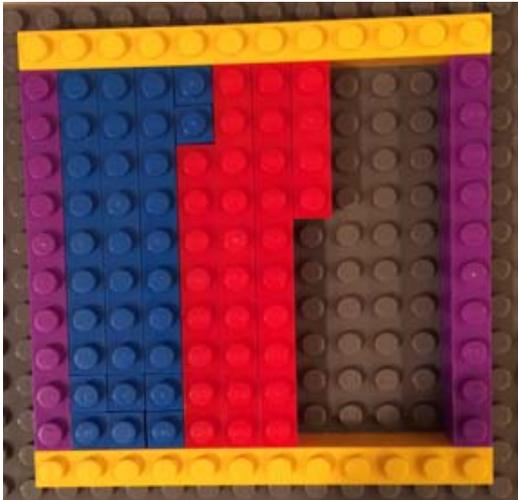
Step 2: Combine like place value bricks to show sum of 5.82



Chapter 6

1. $2 \times 0.32 = 0.64$

Blue bricks in decimal grid show one set of .032; red bricks show another set of 0.32; use repeated addition to find product of 0.64.



$$2.5 \times 0.3 = 1.5$$

Step 1:

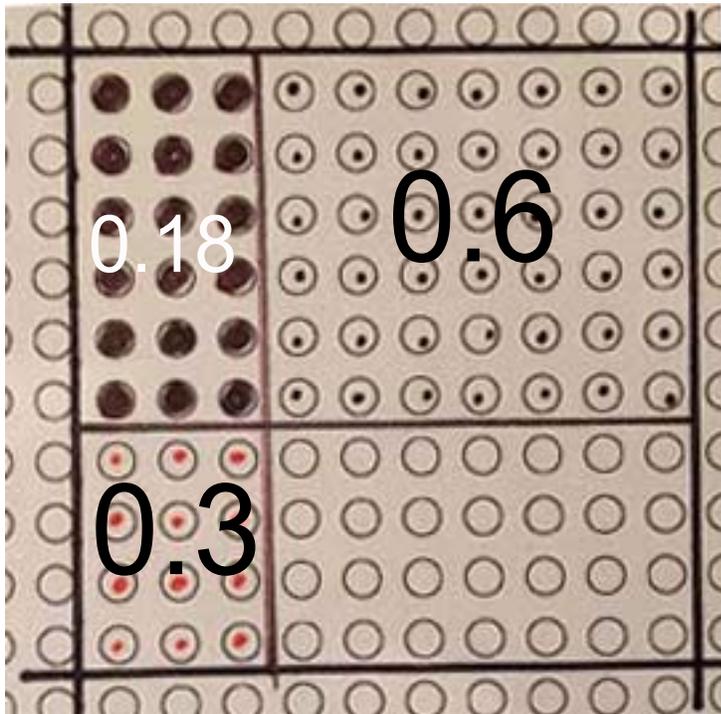
Model 5 sets of 3 tenths (0.3) as an array, with each 1x2 brick modeling 1 tenth (0.1).



Step 2: Ten tenths (1 whole) covered with purple bricks. Five tenths (0.5) uncovered. Shows product of 1.5.



3. Drawing of model shows lower layer of 0.3 in red dots and lower layer of 0.6 in black dots. Intersection that models product of 0.18 is shown in solid brown.



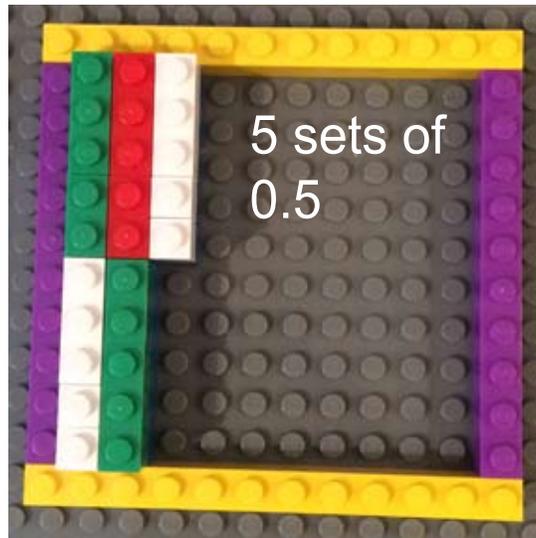
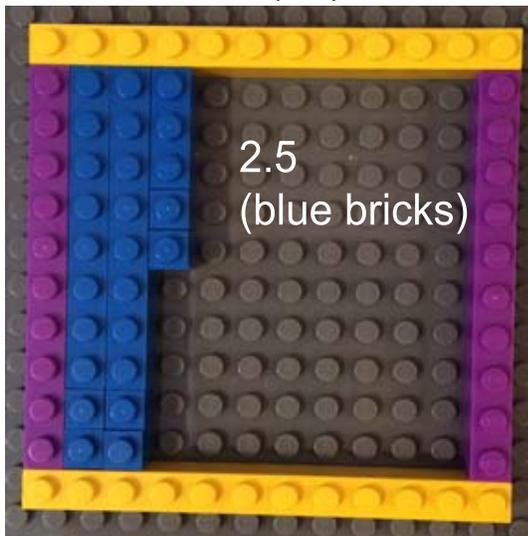
Chapter 7

1. The division of decimals is like division of whole numbers because in both cases the quotient refers to sets of the divisor.

2. Dividend 2.5; divisor 0.5

$$2.5 \div 0.5 = 5$$

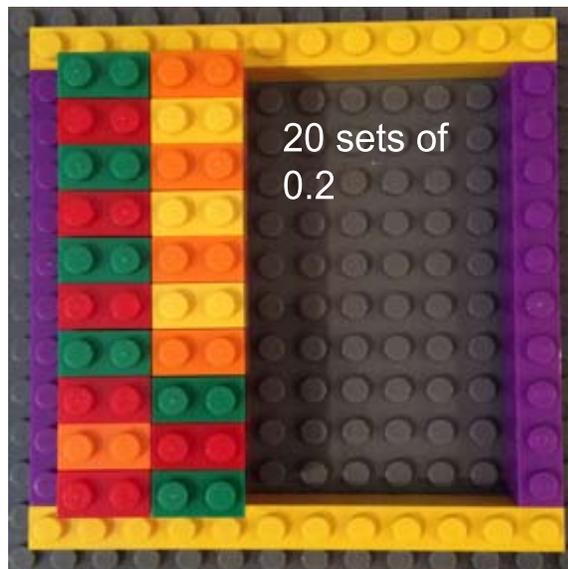
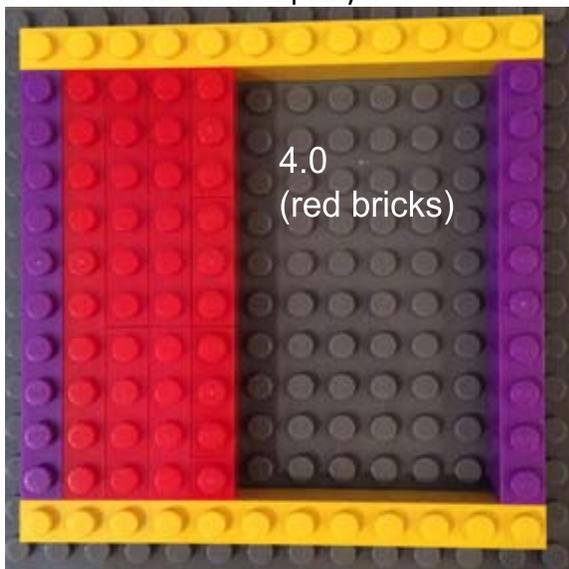
5 sets of 0.5 divide equally into 2.5



3. Dividend 4.0; divisor 0.2

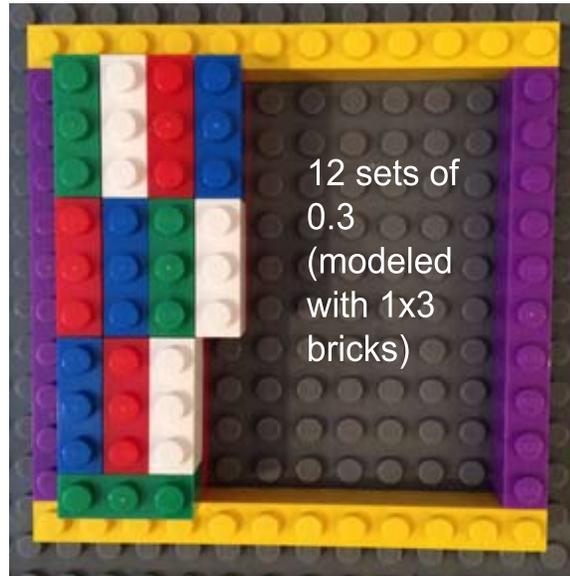
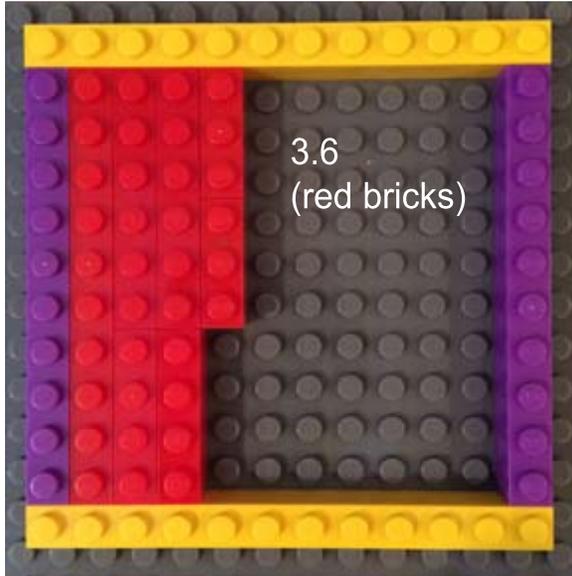
$$4.0 \div 0.2 = 20$$

20 sets of 0.2 divide equally into 4.0



4. Dividend 3.6; quotient 12; divisor is 0.3

Note: Students must determine the size brick that will cover the dividend bricks of 3.6 evenly with 12 bricks. A 1x3 brick is the correct size, which models 0.3.

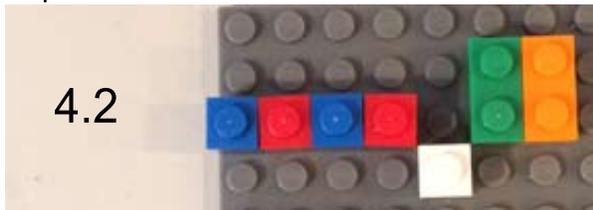


Chapter 8

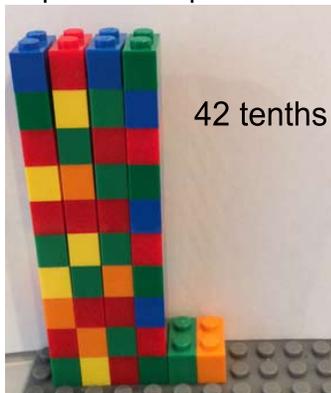
1. $4.2 \div 0.2 = 21$

Note: Students will model the problem in several steps.

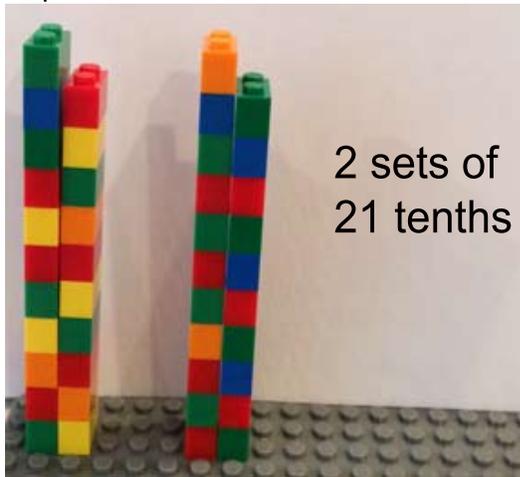
Step 1: model 4.2



Step 2: Decompose all the ones into tenths (40 tenths plus 2 tenths)



Step 3: Divide the 42 tenths into 2 sets of 21 tenths



2. $1.2 \div 0.3 = 4$

Note: Students will model the problem in several steps.

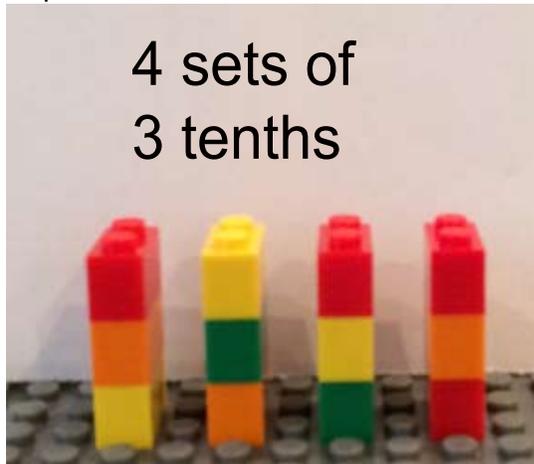
Step 1: model 1.2



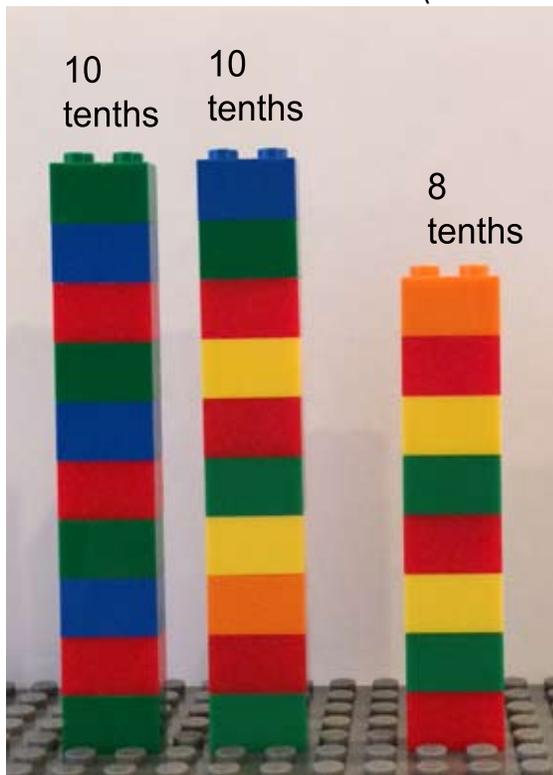
Step 2: Decompose the one into tenths (10 tenths plus 2 tenths)



Step 3: Divide the 12 tenths into 4 sets of 3 tenths

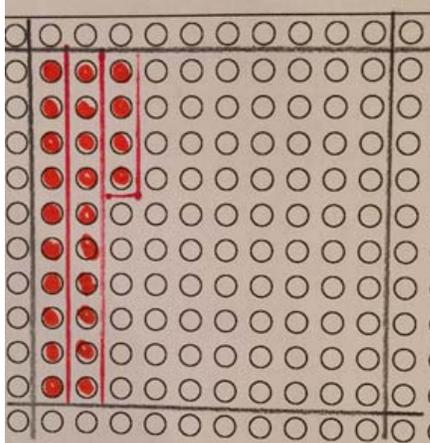
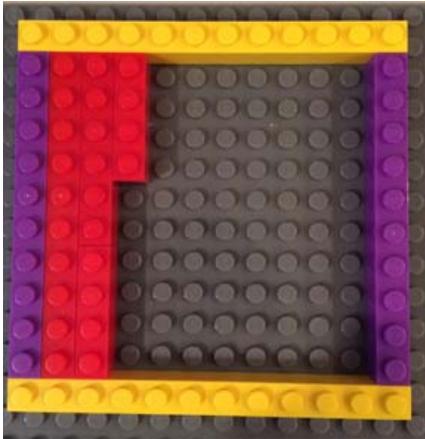


3. 2.8 is the same as 28 tenths because decomposing 2 into tenths is 20 tenths. Then add the extra 8 tenths to total 28 tenths ($20 + 8 = 28$; $2.0 + 0.8 = 2.8$).

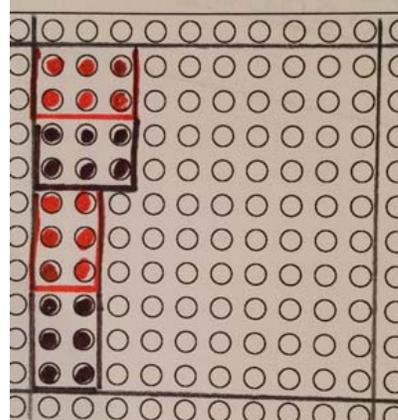
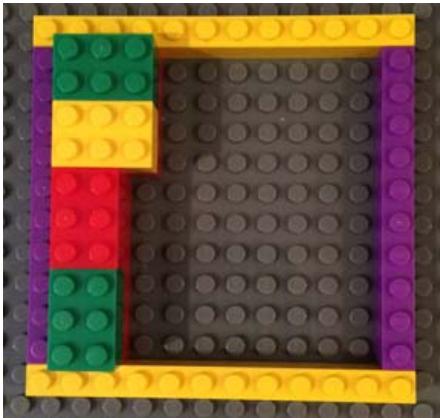


Chapter 9

1. Step 1: model 2.6 on a grid (red bricks)



Step 2: divide by 0.6 using four 2x3 bricks to represent 4 sets of 0.6

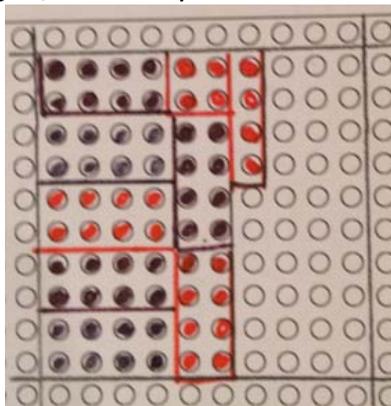
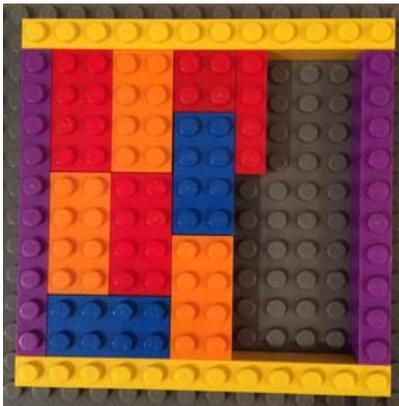


Math sentence: $2.6 \div 0.6 = 4$

2. $0.64 \div 0.08 = 8$

Quotient is 8

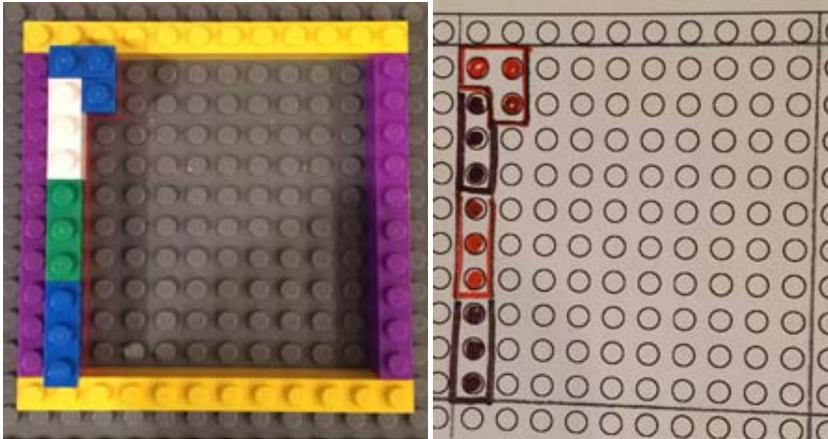
0.64 is modeled on the decimal grid, divided by 8 sets of 0.08



3. $1.2 \div 0.3 = 4$

Quotient is 4

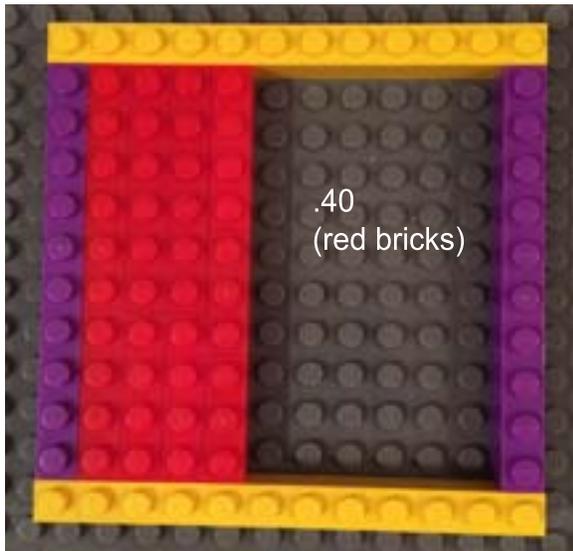
1.2 is modeled on the decimal grid, divided by 4 sets of 0.3



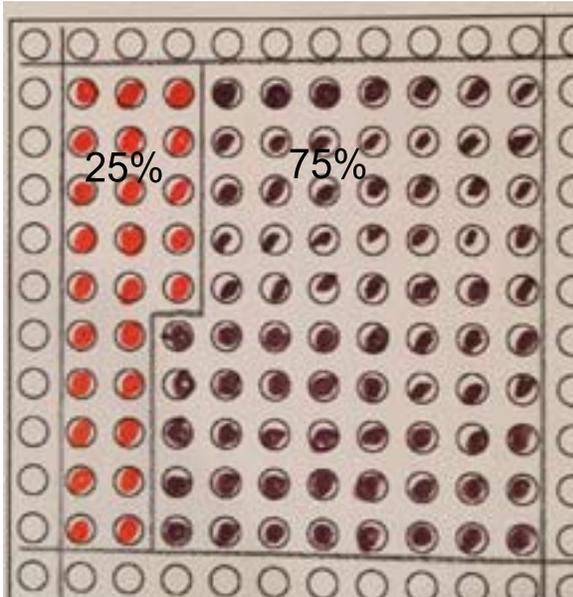
Chapter 10

1. Fraction: $40/100 = 4/10$

Percent: 40%

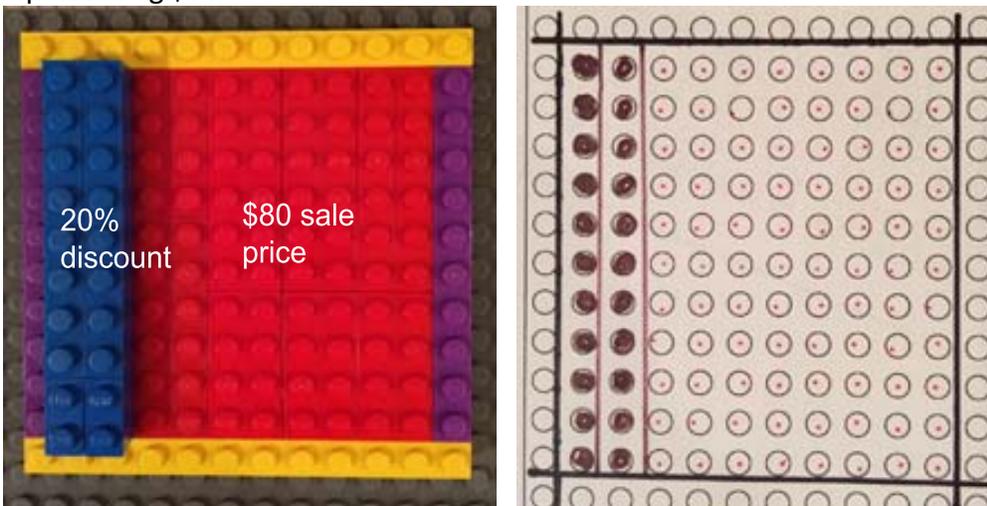


2. The whole decimal grid represents 100% of the class. Bricks that model 25% show students who like to read science fiction. The remainder of the bricks model students who do not like to read science fiction. Since $25 + 75 = 100$, the percentage who don't like science fiction is 75%.



3. The \$100 regular price is modeled by 100 studs covered (in red) in the decimal grid. The 20% off discount is modeled by covering 20 of the studs (in blue).

Note: If students are ready, the sale price of the bicycle is modeled by the red bricks showing, representing \$80.



4. *Note:* Students could approach this problem in different ways, depending on their understanding of the link between fractions and decimals.

Alternative 1: Model 20 students in class with 20 studs. Find a brick that shows tenths of this model (1x2 brick). Since 25% is $\frac{1}{4}$ as a fraction, 20 divided into 4 sets means that $\frac{1}{4}$ is 5 students.

