

Goals:

- Summarize that in subtracting two multi-digit Natural numbers where the subtrahend and minuend differ in number of digits, one subtracts according to place value position.
- Estimate differences mentally.

Prerequisite Knowledge:

- Understanding of place value up to hundreds
 - Understanding of numeric representations using base-ten blocks up to the hundreds place
-

Activities:

1. Working with a partner:
 - a. Your instructor will post some subtraction problems on the board. Without any calculation (!!), identify which problems have trades and how many trades. Then, fill out the table below listing the problems in the proper column.

No Trades Needed	One Trade Needed	Two Trades Needed	Three or more trades

- b. Whole Class Discussion: How do you determine the number of trades in a subtraction problem?

2. Working with a partner, draw each of the following subtraction problems in the space provided using the base-ten blocks. Be sure to draw and highlight the trades, if present in the problem. Be prepared to share your results/drawings with the class.

Do not draw in this space.

a. $27 - 6$

b. $34 - 8$

c. $128 - 49$

d. $352 - 167$

e. $2572 - 1951$

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Prerequisite Knowledge:

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Lesson Materials:

- None

Preparation

- None
-

Lesson Breakdown:

Activity	Size of Group	Time in Activity Total Time: 55 minutes
Present 5 problems to identify the number of borrows required	Groups of 2	15 minutes
Draw the 5 problems and compare them to the written solutions	Groups of 2	30 minutes
Discuss the necessity of trades in the algorithm for subtraction	Whole class	10 minutes

Activities:

5. Working with a partner:
 - a. Your instructor will post some subtraction problems on the board. Without any calculation (!), identify which problems have trades and how many trades. Then, fill out the table below listing the problems in the proper column.

Suggest to give the students the following problems, which are the same problems in problem #2.

- (i) 27-6
- (ii) 34-8
- (iii) 128-49
- (iv) 352-167
- (v) 2572-1951

Make sure students are not using pencil and paper nor trying to do the computation. Want them to confront how to know when trades are needed. It's the foundational knowledge for being able to subtract using pencil and paper.

No Trades Needed	One Trade Needed	Two Trades Needed	Three or more trades
$27 - 6$	$34 - 8$ $2572 - 1951$	$128 - 49$ $352 - 167$	

- b. Whole Class Discussion: How do you determine the number of trades in a subtraction problem?

The following discussion should come from student's discussions:

We subtract based on place value. When we are subtracting, we need enough of each type to cover the transaction of taking away in each place value location. So, we look at each place value and ensure that we have enough to cover the taking away action. When we do not, then we need to borrow (break a larger amount into its smaller pieces) in order to subtract.

6. Working with a partner, draw each of the following subtraction problems in the space provided using the base-ten blocks. Be sure to draw and highlight the trades, if present in the problem. Be prepared to share your results/drawings with the class.

Do not draw in this space.

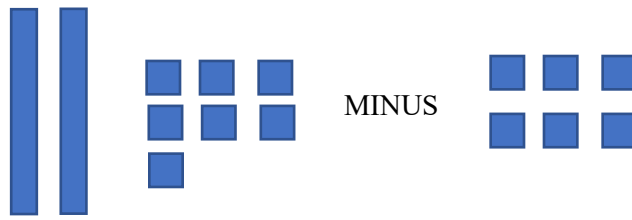
$$\begin{array}{r} 27 \\ - 6 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 34 \rightarrow 214 \\ - 8 \\ \hline 26 \end{array}$$

34 is the same as 2 tens
And 14 ones

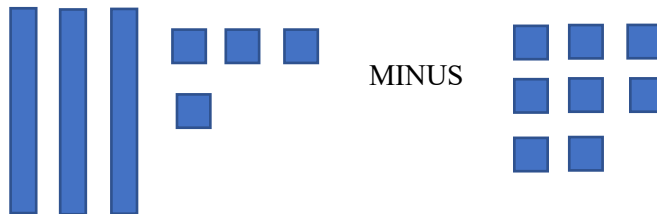
$$\begin{array}{r} \text{tens} \\ 128 \\ - 49 \\ \hline \end{array}$$

a. $27 - 6$

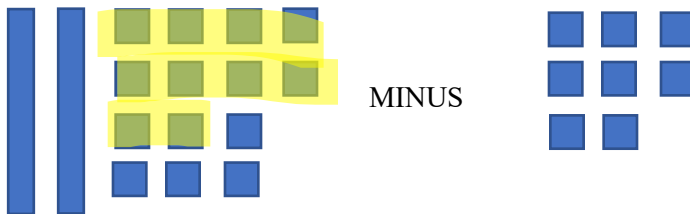


b. $34 - 8$

Before trades

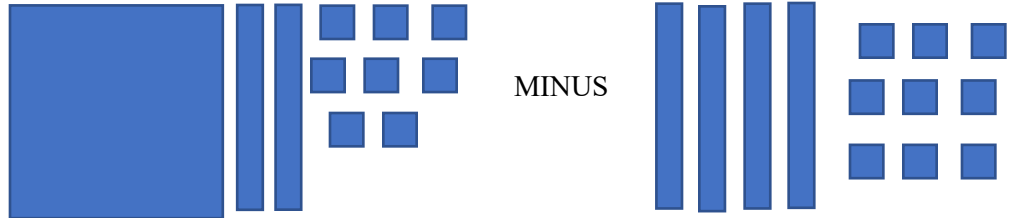


After trades

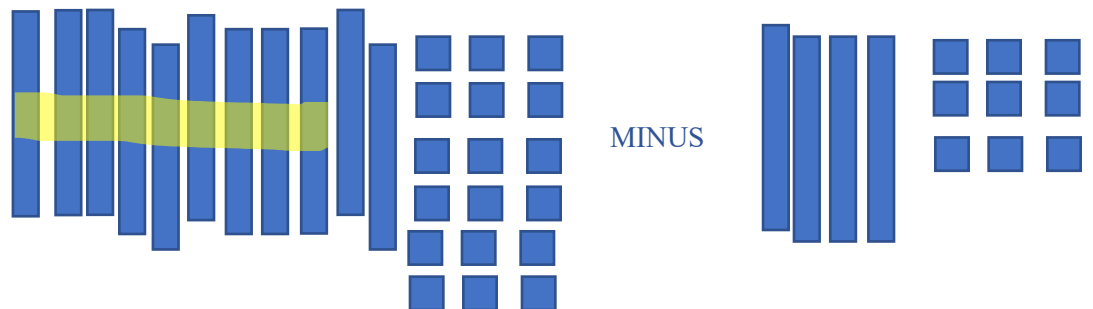


c. $128 - 49$

Before Trades



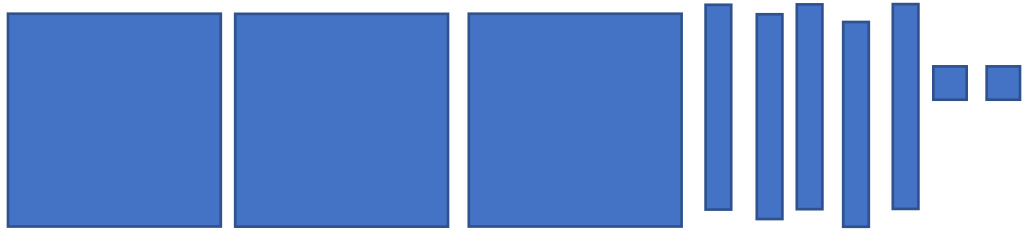
After Trades



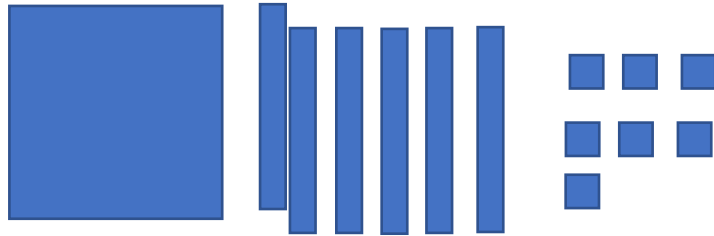
$$\begin{array}{r} 352 \\ - 167 \\ \hline \end{array}$$

$$\begin{array}{r} \hookrightarrow 2 \quad 14 \quad 2 \\ - 167 \\ \hline \end{array}$$

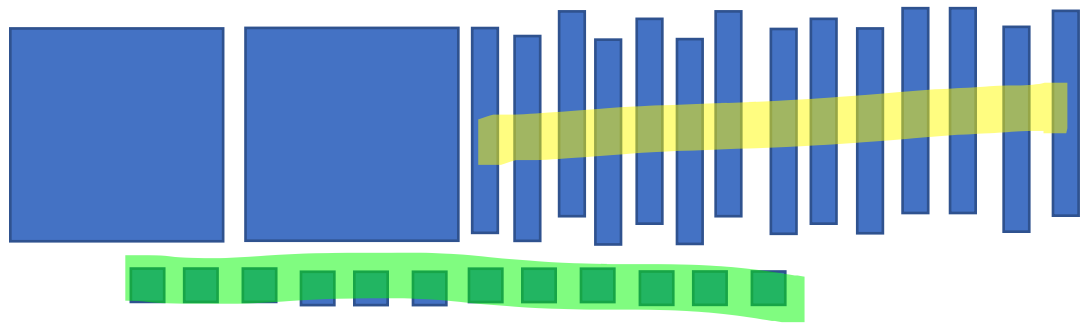
d. 352 - 167
Before Trades



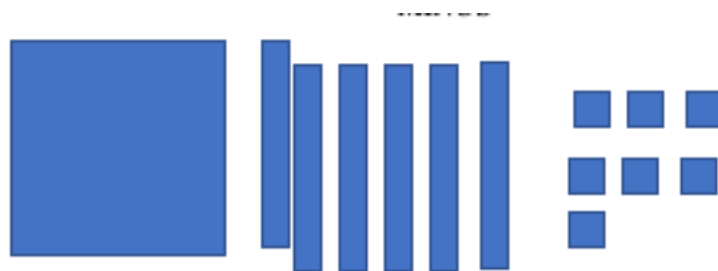
MINUS



After Trades

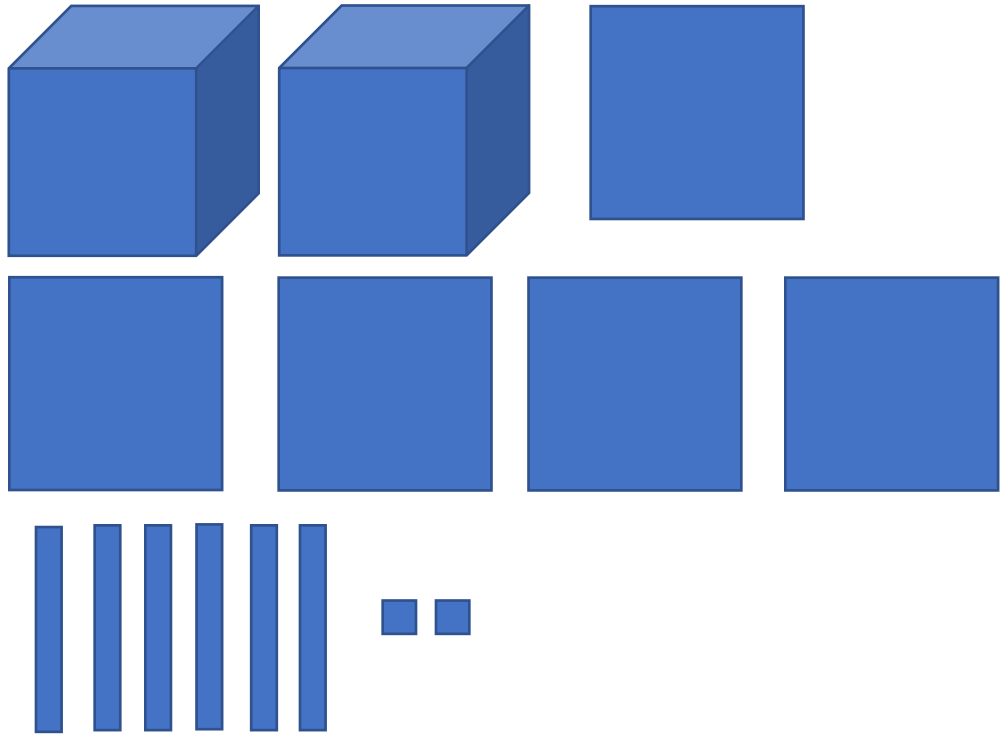


MINUS

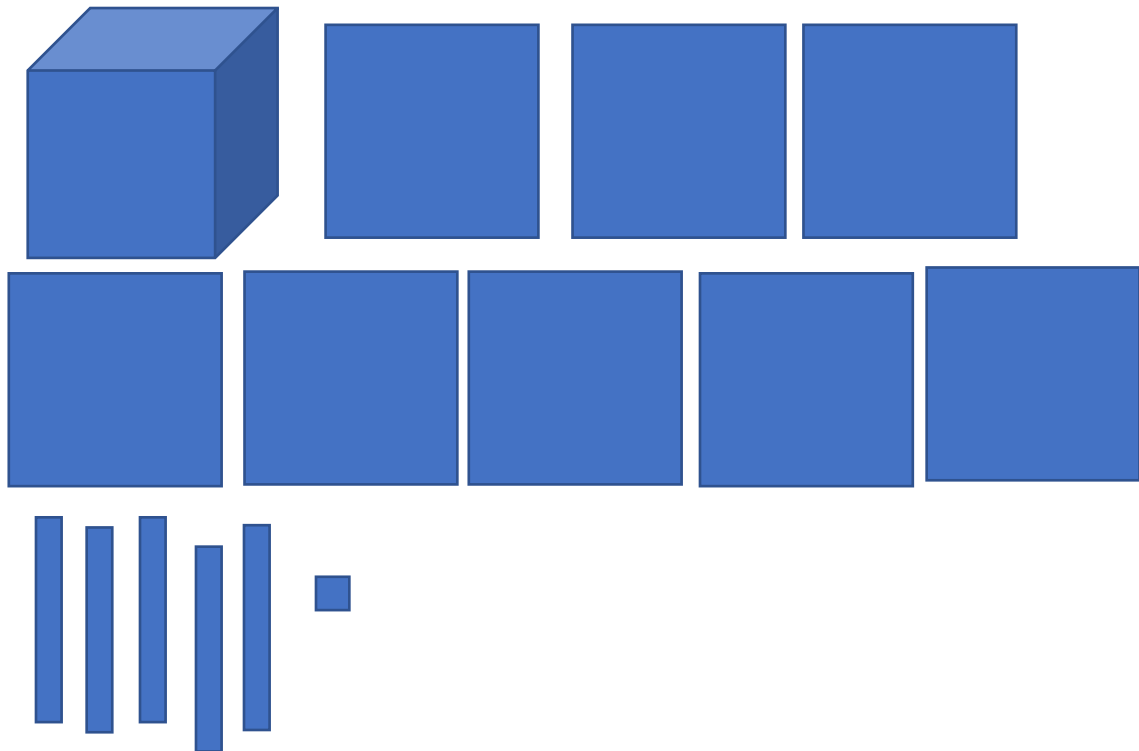


e. $2572 - 1951$

Before Trades



MINUS

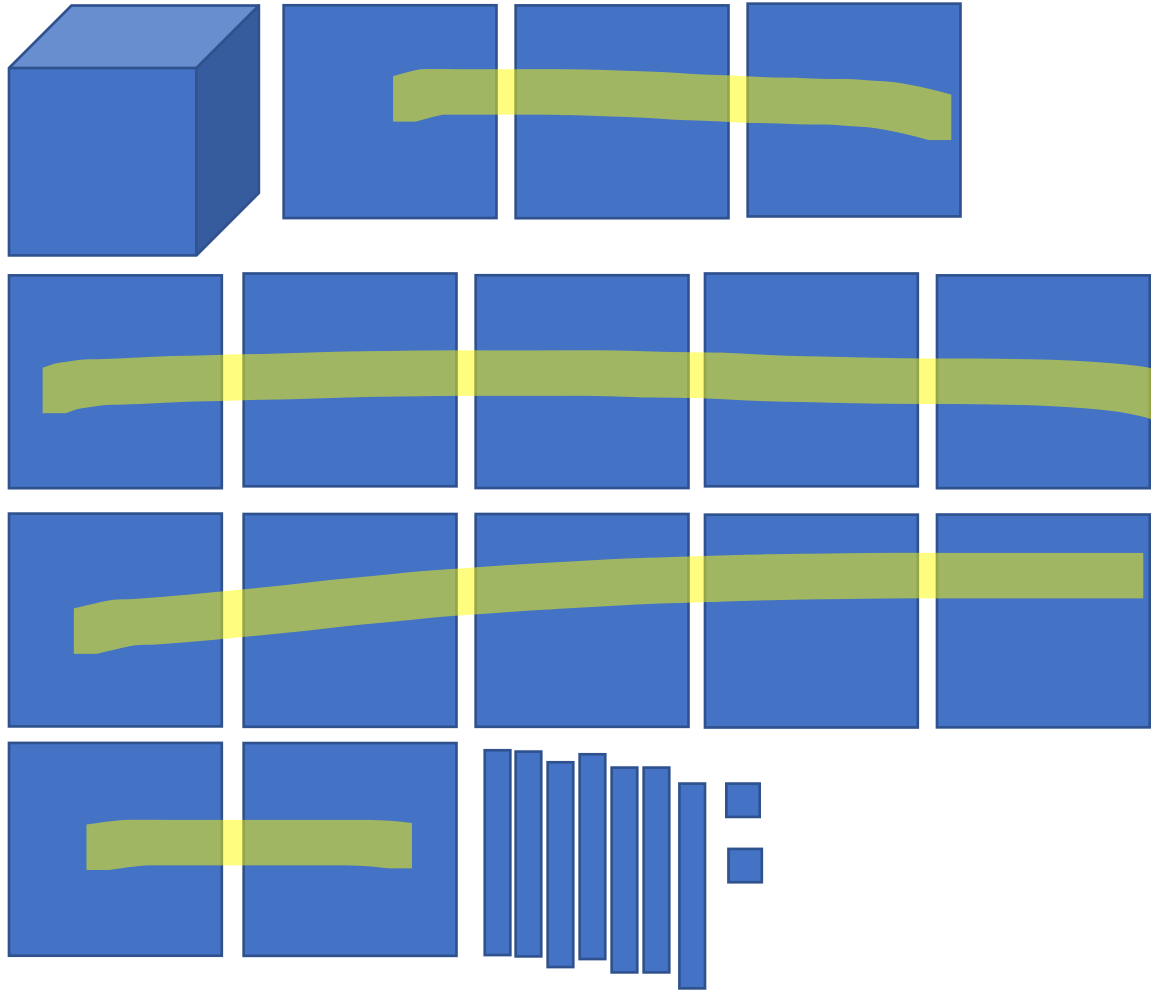


$$\begin{array}{r} 2572 \\ - 1951 \\ \hline \end{array}$$

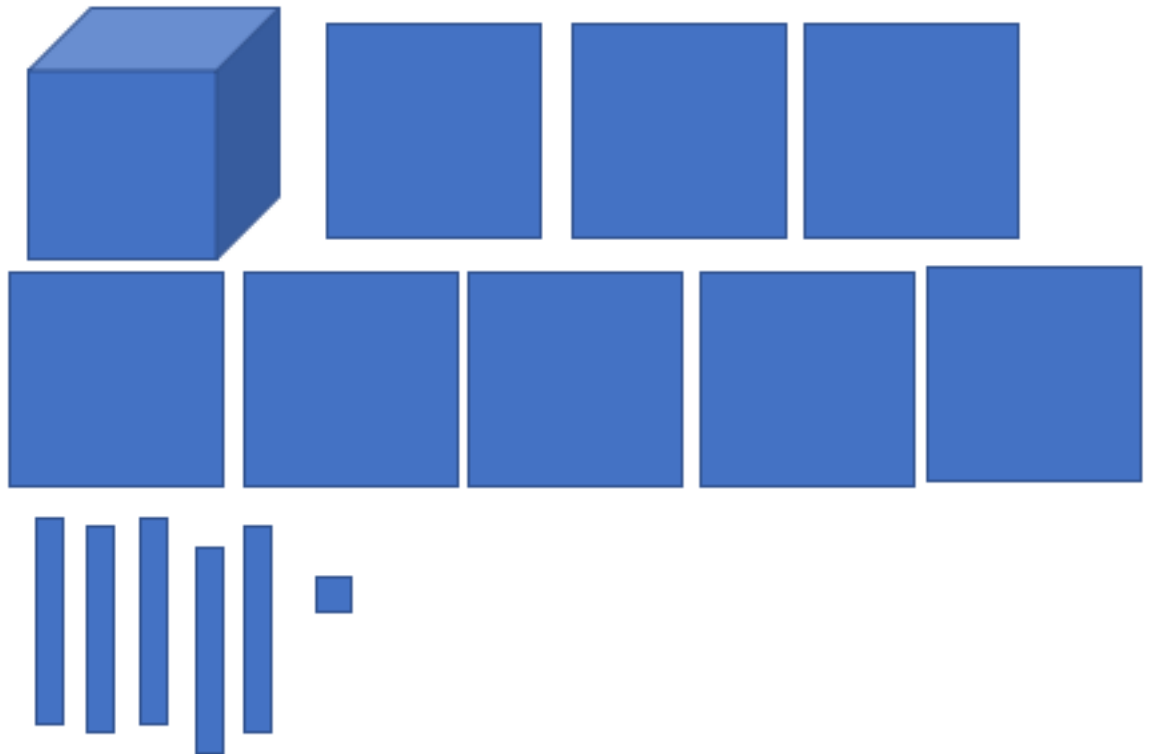


1572
- 1951

After Trades



MINUS



7. Next to each drawing in problem 2, in the space on the left side of the page, do the normal paper-and-pencil method for subtraction. Highlight or circle the borrows in each problem when applicable. Be prepared to share your results with the class. (Space provided below for re-work, if necessary.)

8. Whole Class Discussion: Explain the standard algorithm for subtracting multi-digit natural numbers. What does it mean to borrow? Why or when are borrows necessary?

Want to get them to summarize: Summarize that in subtracting two multi-digit natural numbers where the subtrahend and minuend differ in number of digits, one subtracts according to place value position.

Borrowing is necessary when we are subtracting, we need enough of each type to cover the transaction of taking away in each place value location. So, we look at each place value and ensure that we have enough to cover the taking away action. When we do not, then we need to borrow (break a larger amount into its smaller pieces) in order to subtract.

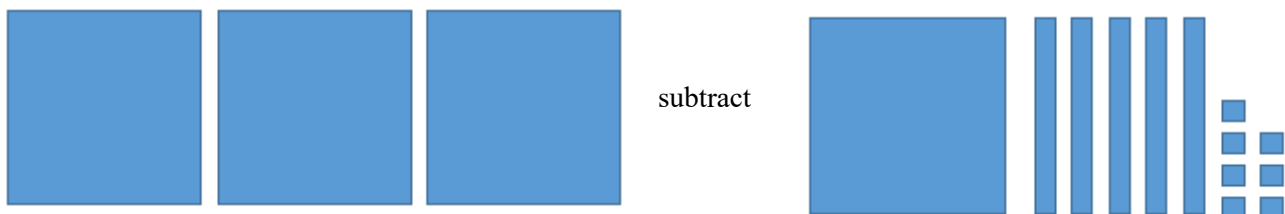
2. Cody is driving to Pleasantville, which is 483 miles from his home. His car has enough gas to take him 192 miles. How far will Cody be from Pleasantville when he runs out of gas?
 - a. Write a subtraction problem that represents this scenario.
 - b. Draw the subtraction problem using base-ten blocks.
 - c. Work out the subtraction problem using a pencil-and-paper method.
 - d. Relate the drawing to the written work.

Day 03 – Homework Solutions

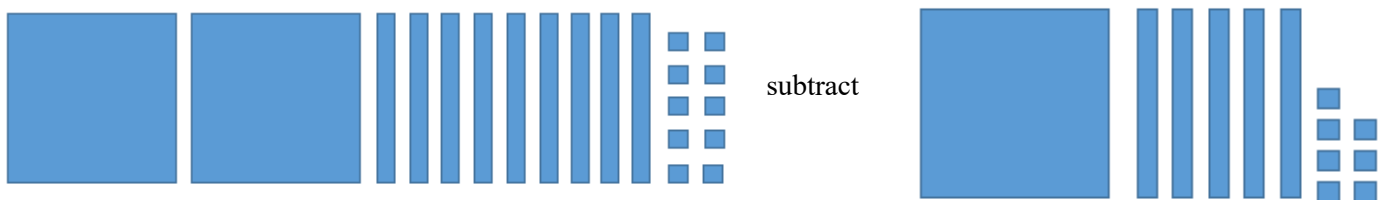
1. Kevin has \$300 in his budget to buy a pair of shoes. He heads to the store and picks a pair of boots that cost \$157. How much money does Kevin have left over?
 - a. Write a subtraction problem that represents this scenario.
Answer: $300 - 157$
 - b. Draw the subtraction problem using base-ten blocks.

Answer:

Before Trades



After Trades



equals:



c. Work out the subtraction problem using a pencil-and-paper method.

Answer: 300 is the same as 2 hundreds, 9 tens, and 10 ones.

$$\begin{array}{r} \overset{2}{3} \overset{9}{0} \overset{10}{0} \\ - 157 \\ \hline 143 \end{array}$$

d. Relate the drawing to the written work. **Answer:** The trades performed with the base-ten blocks (trading in one hundred for ten tens, then trading in one ten for ten ones), is the same as the borrowing done in the paper-and-pencil method.

Day 03 – Homework Solutions

2. Cody is driving to Pleasantville, which is 483 miles from his home. His car has enough gas to take him 192 miles. How far will Cody be from Pleasantville when he runs out of gas?

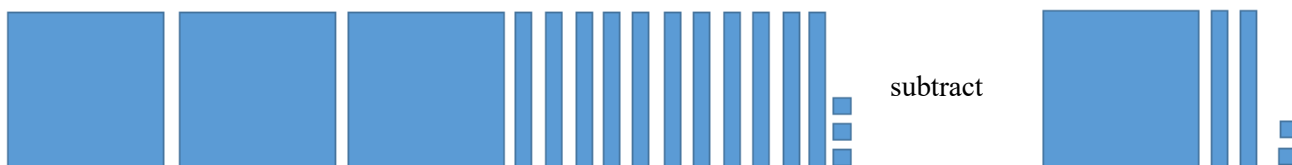
- Write a subtraction problem that represents this scenario. **Answer:** $413 - 122$
- Draw the subtraction problem using base-ten blocks.

Answer:

Before Trades



After Trades



equals:



- c. Work out the subtraction problem using a pencil-and-paper method.

Answer: 413 is the same as 3 hundreds, 11 tens, and 3 ones.

$$\begin{array}{r} ^3 ^{11} \\ 4 1 3 \\ - 1 2 2 \\ \hline 2 9 1 \end{array}$$

- d. Relate the drawing to the written work. **Answer:** Trading in one hundred for ten tens (thus ultimately having eleven ten rods) using the base-ten blocks, is the same as the borrowing done in the paper-and-pencil method.