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# Notes and Class Participation

Directions: Print this handout. Use this handout to take notes as you read pages 98-117, watch the lecture video, and view the PowerPoint slides. After you complete this handout, scan pages 1- 12, and attach them to Lesson 5 Class Participation Assignment. Hyperlinks are on page 13.

Section 3.2 Lecture Video PowerPoint Slides

## Whole Numbers

The set of whole numbers is W = { } 

## Common Core Addition Models

Watch this video about Common Core Addition Models.

## Set Model for Addition of Whole Numbers

Define *addition of whole numbers* using the *set model*.

Use the set model to illustrate the following problem.
Karen had 3 marbles in one bag and 5 marbles in another bag. How many marbles did Karen have altogether?

In the problem 3 + 5 = 8, what are the *addends*?

What is the *sum*?

## Line Model for Addition of Whole Numbers

In modeling addition of whole numbers with the line model, where does the first addend directed arrow (vector) start on the number line?

Use the line model to illustrate the following problem. Steve had a 2-inch rope and a 4-inch rope. How many inches of rope did Steve have altogether?

## Ordering Whole Numbers

Define *less than*.

How can you use a number line to show less than and greater than relationships between whole numbers?

Write the mathematical symbol for each phrase below:

- Less than
- Less than or equal to
- Greater than
- Greater than or equal to

## Mastering Addition Facts

Watch this video about basic addition fact strategies.

Give an example of each of the following strategies for learning groups of addition facts.

1. Adding on

2. Doubles

3. Double plus 1

4. Making a 10: Watch this video for an illustration of this strategy.

Watch this video on how to determine what order to teach addition facts to students.

## Whole Number Addition Properties

### Closure Property

Watch this video about the closure property.

If two whole numbers are added together, is the sum always a whole number?

Write the *closure property of addition of whole numbers*.

Answer the following:

- Is the set of even numbers closed under addition? That is, if you add any two even numbers, will the sum be an even number?
- Is the set of odd numbers closed under addition? That is, if you add any two odd numbers, will the sum be an odd number?
- Is the set {0, 2} closed under addition? That is, if you add any two numbers in the set, will the sum be a number in the set? Careful! Make sure to check 2 + 2.

## Commutative Property

Write the *commutative property of addition of whole numbers*.

Using a number line, show that the commutative property of whole numbers is true for the addends 4 and 3.

## Associative Property

Write the *associative property of addition of whole numbers*.

Using a number line, show that the associative property of whole numbers is true for the addends, 2, 5, and 1.

Watch this video about the Commutative and Associative Properties.

## Identity Property

What is the *additive identity* whole number?

Write the *identity property of addition of whole numbers*

Using the set model for addition, show the identity property of addition is true for the addend 3.

State the addition property illustrated in the following:

1. (2 + 3) + 7 = 2 + (3 + 7)
2. (1 + 8) + 6 = 8 + (6 + 1) = 6 + (1 + 8)
3. 23 + 35 equals a unique whole number
4. 3 + 5 = 5 + 3

## Addition Algorithms

Add the following using the standard algorithm:

45 + 76

Add the following using expanded algorithm:

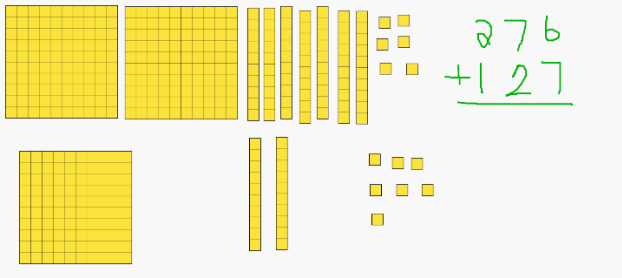
45 + 76

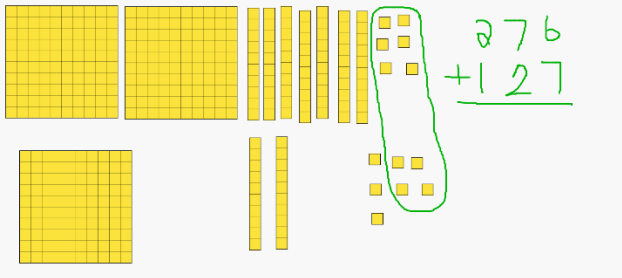
Add the following using base 10 blocks. Show regrouping. 45 + 76

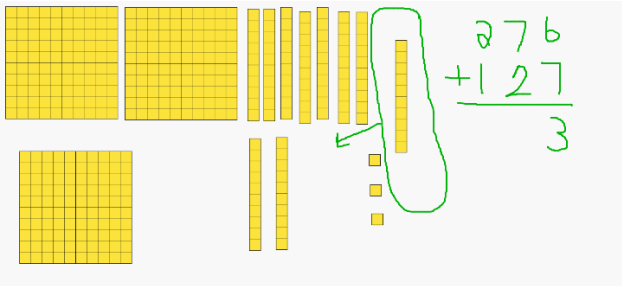
45 + 76

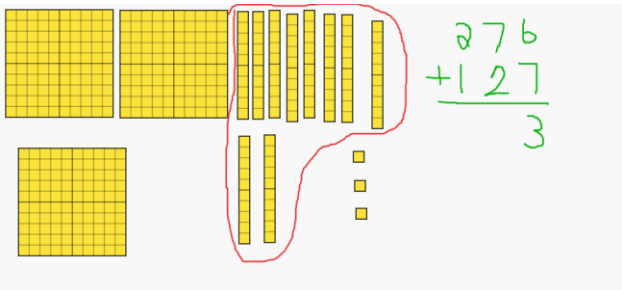
Visit this base ten block virtual manipulative website.

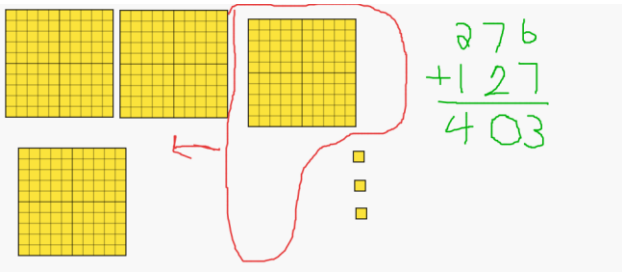
Take time and explore all of the tools that are available. Practice several addition problems using the virtual manipulatives. The following was created using these base 10 block virtual manipulatives.



Add 135 + 169 using virtual base blocks found here. Use the share work/copy image tool. Use the example above as a model. Show each step of the process. Turn this in as a separate file.

See textbook for examples of the following algorithms. Use the examples as models to following while completing the following:

Add the following using partial sums algorithm:

135 + 169

Add the following using column addition algorithm:

135 + 169

Add the following using the lattice algorithm:

135 + 169

Add the following using the opposite change algorithm:

135 + 169

Add the following using the scratch algorithm. 87 + 96 + 89

## Base 5 Addition

Construct a base 5 addition table.

| + | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 0 | | | | | |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |

Watch these videos about base 5 addition using base 5 blocks.

Video 1 Video 2 Video 3

Add the following base 5 numbers using base 5 blocks: $134_{five} + 43_{five}$

Add the following base 5 numbers using the standard algorithm: $134_{five} + 43_{five}$

Add the following base 5 numbers using the expanded algorithm: $134_{five} + 43_{five}$

Add the following base 5 numbers using the lattice algorithm: $134_{five} + 43_{five}$

## Mental Computation and Estimation

What is *mental computation*?

What is *estimation*?

What is the difference between mental computation and estimation?

Watch this video about mental computation strategies.

### Mental Computation

Add the following using the mental computation strategy of adding from the left: 76 + 37 Show mental steps on paper.

Add the following using the mental computation strategy of breaking up and bridging: 76 + 37 Show mental steps on paper.

Add the following using the mental computation strategy of trading off: 76 + 37 Show mental steps on paper.

Add the following using the mental computation strategy of making compatible numbers: 78 + 25 Show mental steps on paper.

Add the following using the mental computation strategy of making compatible numbers. Show mental steps on paper. 130 + 50 + 70 + 20 + 50

Watch this video where a student explains how he added two numbers.

What properties, addition strategies, or mental computation strategies did you hear him use?

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What properties, addition strategies or mental computation strategies did you hear her use?

## Estimation

Estimate the sum using the front end with adjustment strategy: 532 + 441 + 759
Describe mental steps on paper.

Estimate the sum using the grouping to nice numbers strategy: 26 + 38 + 29 + 66 + 72
Describe mental steps on paper.

Estimate the sum using the rounding strategy:

441 + 789

Describe mental steps on paper.

Estimate the sum by finding the range of the answer: 441 + 789

Describe mental steps on paper.

## Review Terms:

Review terms from Section 3.2 by using flashcards found here. Select chapter 3 and then select section 2. Review the terms until you know them.

## Hyperlinks

- Lecture video: https://mediaplayer.pearsoncmg.com/assets/BMT13_sl_0302
- PowerPoint slides: https://cwoer.ccbcmd.edu/math/math131/Lesson7Section3.2.ppsx
- Make a 10 Video: https://www.youtube.com/embed/q9h4skGoWJ8?r=0
- Basic Addition Fact Strategies Video: https://www.youtube.com/embed/jCIYqzJ7spY?r=0
- Common Core Addition Models Video: https://mediaplayer.pearsoncmg.com/assets/BMT12_ccia_0302_01

- Closure Property video: https://www.youtube.com/embed/lrEj3PGv3cs?r=0
- Commutative and Associated Properties Video: https://www.youtube.com/embed/nTVtOSUk_4g?r=0
- Base 10 Virtual Manipulatives: https://apps.mathlearningcenter.org/number-pieces/
- Base 5 Addition Video 1: https://www.youtube.com/embed/pYcDsgp2i8o?r=0
- Base 5 Addition Video 2:https://www.youtube.com/embed/cJiUOewrsYw?r=0
- Base 5 Addition Video 3:https://www.youtube.com/embed/-3nVbeNPUTU?r=0
- Teaching mental addition strategies video:
- A student's mental addition strategies video: https://mediaplayer.pearsoncmg.com/assets/IMAP_131
- A student's mental addition strategies video: https://mediaplayer.pearsoncmg.com/assets/IMAP_151
- A student's mental addition strategies video: https://mediaplayer.pearsoncmg.com/assets/IMAP_168
- Flashcards: https://media.pearsoncmg.com/aw/aw_billstein_mathforteachers_13/flashcards/launch.html