# Unit Name:
# Addition Strategies

## Common Core State Standards:

**2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

**2.NBT.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.

**2.NBT.7** Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

**2.NBT.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

**2.NBT.9** Explain why addition and subtraction strategies work, using place value and the properties of operations.

## Essential Vocabulary:

- odd
- even
- row
- column
- rectangular array
- equal
- addend
- equation
- sum
- fluent
- compose

- decompose
- place value
- digit
- ten more
- ten less
- one hundred more
- one hundred less
- add
- subtract
- addition
- subtraction

## Unit Overview:

Second graders use rectangular arrays to work with repeated addition, a building block for multiplication in third grade. A rectangular array is any arrangement of things in rows and columns, such as a rectangle of square tiles. Students explore this concept with concrete objects (e.g., counters, bears, square tiles, etc.) as well as pictorial representations on grid paper or other drawings. Due to the commutative property of multiplication, students can add either the rows or the columns and still arrive at the same solution.

Second Grade students add a string of two-digit numbers (up to four numbers) by applying place value strategies and properties of operations.

Second graders extend the work from 2.NBT.5 to two 3-digit numbers. Students should have ample experiences using concrete materials and pictorial representations to support their work. This standard also references composing a ten. This work should include strategies such as making a 10, making a 100, or creating an easier problem. The standard algorithm of carrying is not an expectation in Second Grade. Students are not expected to add whole numbers using a standard algorithm until the end of Fourth Grade.

Second Grade students mentally add or subtract either 10 or 100 to any number between 100 and 900. As teachers provide ample experiences for students to work with pre-grouped objects and facilitate

discussion, second graders realize that when one adds or subtracts 10 or 100 that only the tens place or the digit in the hundreds place changes by 1. As the teacher facilitates opportunities for patterns to emerge and be discussed, students notice the patterns and connect the digit change with the amount changed. Opportunities to solve problems in which students cross hundreds are also provided once students have become comfortable adding and subtracting within the same hundred.

Second graders explain why addition strategies work as they apply their knowledge of place value and the properties of operations in their explanation. They may use drawings or objects to support their explanation. Once students have had an opportunity to solve a problem, the teacher provides time for students to discuss their strategies and why they did or didn't work.

## Strategies/Skills:
- using an array to find a total
- adding up to four 2-digit numbers
- 3-digit addition with base ten place value blocks
- 3-digit addition with proof drawings
- 3-digit addition using a number line
- 3-digit addition using the expanded method

## Video Support:
Video support can be found on The WCPSS Academics YouTube Channel.
- http://tinyurl.com/WCPSSAcademicsYouTube
  - ES 2 Math Using an Array to Find a Total
  - ES 2 Math Adding up to four 2-digit numbers
  - ES 2 Math 3-digit Addition with Base Ten Place Value Blocks
  - ES 2 Math 3-digit Addition with Proof Drawings
  - ES 2 Math 3-digit Addition using a Number Line
  - ES 2 Math 3-digit Addition using the Expanded Method

## Additional Resources:
If you have limited/no internet access, please contact your child's teacher for hard copies of the resources listed in this document.
- NCDPI Unpacking Document: 2nd Grade Unpacking Document
- Please visit the Kahn Academy website at www.khanacademy.org  for additional videos and activities.  Look under the *Early Math* tab.
- Please visit the Learn Zillion website at www.learnzillion.com to find 2nd Grade math lessons and videos that align with Common Core Standards.