LaGrange School District 105
2nd Grade Math Curriculum

Statement of Philosophy:
Mathematics is an integrated, balanced program strong in the acquisition of computational skills and the development of mathematical reasoning. To prepare students to be college and career ready, mathematics instruction must build procedural fluency from conceptual understanding. Students should develop the ability to solve problems and reason logically while working with various media and gaining mathematical competency. The mathematics curriculum is viewed as a continuum of introducing, developing, and extending skills. The program is structured yet flexible enough to meet each student's needs.

Mathematical Practices:
The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. There are eight (8) practices outlined through the Common Core Math Standards:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning.

For more detailed descriptions of each mathematics practice visit: http://www.corestandards.org/Math/Practice/

2nd Grade Mathematics - Overall Emphasis

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes.

1. Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).
2. Students use understanding of addition to develop fluency with addition/subtraction within 100. They solve problems within 1000 by applying understanding of models for addition/subtraction, and develop and use efficient, accurate, and generalizable methods to compute sums/differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods appropriate for context and numbers involved to mentally calculate sums/differences for numbers with only tens or only hundreds.
3. Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves iteration of units. They recognize that the smaller the unit, the more iterations needed to cover a length.
4. Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

For more detailed descriptions of each mathematics practices visit: http://www.corestandards.org/Math

2nd Grade Mathematics - CCSS Math Focus Strands

Operations and Algebraic Thinking
- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.

Number and Operations in Base Ten
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data
- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

Geometry
- Reason with shapes and their attributes.

Unit 1: Extending Base Ten Understanding
Timing: August-September

Big Ideas in Unit 1:

Understanding Place Value
- Explain the value of each digit in a 3-digit number
- Identify a bundle of 10 tens as a "hundred"
- Represent a three digit number with hundreds, tens , and ones
- Represent 200, 300, 400, 500, 600, 700, 800, 900 with one, two, three, four, five, six, seven, eight or nine hundreds and 0 tens and 0 ones.
- Skip count to 1,000 by 5's, 10's, and 100's

Express Understanding of Place Value through Reading and Writing
- Read and write numbers up to 1,000 using base-ten numerals (e.g., 234) and number names (e.g., two hundred thirty-four)
- Read and write numbers using expanded form (e.g., 200 + 30 + 4)

Comparing Value
- Explain a process for determining whether a three-digit number is greater than, less than, or equal to another three-digit number.
- Determine when a three-digit number is greater than, less than, or equal to another three-digit number, record comparison using symbols >, <, =

Measurement and Data
- Make picture or bar graph with up to four categories to represent data
- Compare data on a bar graph
- Solve addition and subtraction problems using data from a picture or gar graph.

Unit 1 Math Standards and Conceptual Understandings:

2.NBT.1 Understand that three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
2NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.
2NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (addressed in units of instruction all year-long)

Unit 2: Addition and Subtraction
Timing: October-Mid November

Big Ideas in Unit 2:
Word Problems
- Choose when to use addition and/or subtraction in a word problem
- Solve addition and subtraction word problems that involve two steps
- Solve word problems with unknown numbers in different positions (e.g., 5 + _ = 13, + 8 = _)

Mental Math/Fluency
- Use mental strategies (e.g., count on, make a ten) to add or subtract numbers within 20 with ease.
- Recall from memory all sums of two one-digit numbers.
- Add and subtract numbers within 100 with ease by applying strategies (e.g., decomposing numbers into tens and ones, using commutative and associative properties, using mental strategies)

Money
- Identify and give the value of dollar bills, quarters, dimes, nickels, and pennies.
- Use $ (dollar) and ¢ (cents) symbols appropriately.
- Solve a word problem with dollar bills, quarters, dimes, nickels, and pennies
- Identify and give the value of dollar bills, quarters, dimes, nickels, and pennies.

Represent and Interpret Data
- Make picture or bar graph with up to four categories to represent data
- Compare data on a bar graph
- Solve addition and subtraction problems using data from a picture or bar graph

Unit 2 Math Standards and Conceptual Understandings:

2.OA.1 Use addition and subtraction within 100 to solve one and two step word problems. Problems include contexts that involve adding to, taking from, putting together/taking apart (part/part/whole) and comparing with unknowns in all positions.
2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (addressed in units of instruction all year-long)

Unit 3: Understanding Measurement, Length, and Time
Timing: Mid November – Mid January

Big Ideas in Unit 3:

Measurement
- Estimate the length of a given object in inches and feet, centimeters and meters
- Accurate/precise measurement using appropriate tools (e.g., ruler, yardstick, meter stick, measuring tape) to measure an object.

Relate addition and subtraction to length
- Determine the difference in length between two objects using standard units
- Accurately represent whole numbers on a number line
- Determine sums and differences within 100 using a number line

Time
- Explain the difference between a.m. and p.m.
- Using an analog clock, accurately state the time and write the time as it would appear on a digital clock
- Using a digital clock, accurately display correct time on analog clock time (nearest 5 minutes)
- Understand and use special terms such as: half past, quarter after/past, quarter to, minutes after/past, minutes to

Represent Data
- Measure and record the lengths of several objects to the nearest whole-number.
- Create a line plot with a horizontal scale marked off in whole-number units.
- Record length measurements on a line plot.

Unit 3 Math Standards and Conceptual Understandings:

2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.2 Measure the length of an object twice, using length units of different measurements; describe how the two measurements relate to the size of the unit chosen. Understand the relative size of units in different systems of measurement. *For example, an inch is longer than a centimeter.* (Students are not expected to convert between systems of measurement.)

2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.

2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, and

represent whole-number sums and differences within 100 on a number line diagram.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (addressed in units of instruction all year-long)

Unit 4: Applying Base Ten Understanding
Timing: Mid January - February

Big Ideas in Unit 4:

Apply place value understanding to addition and subtraction
- Add up to four two-digit numbers by applying strategies (e.g., decomposing numbers, rearranging the order of the numbers, making tens or multiples of tens based on the numbers being added).
- Use concrete models or drawings to show how to add within 1000 using a strategy based on place value

Mental Math/Fluency
- Mentally add and subtract 10 to/from a given number from 100-900.
- Mentally add and subtract 100 to/from a given number 100-900.

Money
- Solve a word problem with dollar bills, quarters, dimes, nickels, and pennies

Unit 4 Math Standards and Conceptual Understandings:

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.

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.

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (addressed in units of instruction all year-long)

Unit 5: Plane and Solid Figures
Timing: March -April

Big Ideas in Unit 5:
- Identify and name important attributes of a shape
- Draw a shape when given its attributes
- Divide a circle and rectangle into two, three, or four equal parts and describe the equal shares with words (e.g., halves, thirds, fourths).
- Describe a whole by the number of equal parts (e.g., two halves make a whole).

Unit 5 Math Standards and Conceptual Understandings:
2.G.1 Recognize and draw shapes having specified attributes, such as number of angles or number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. **2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them**.** **2.G.3** Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. **2.MD.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (addressed in units of instruction all year-long)

Unit 6: Developing Multiplication
Timing: April - May

Big Ideas in Unit 6:

Work with equal groups of objects to gain foundations for multiplication

- Identify a group of objects as being even or odd using different strategies
- Write an equation to show an even sum has the same addends (e.g., 5 + 5 = 10, 6 + 6 = 12).
- Use addition to find the total number of objects in an array
- Write an addition equation (e.g., 3 + 3 + 3 = 9) to express the total as a sum of equal addends.
- Represent the total number of objects arranged in a rectangular array to express the repeated addition of numbers in each row (or column). For example if there are 3 rows with 4 objects in each row, I can write the expression 4 + 4 + 4.

Unit 6 Math Standards and Conceptual Understandings:
2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends. **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.MD.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (addressed in units of instruction all year-long)