

Mathematics – Grade 2

All West Virginia teachers are responsible for classroom instruction that integrates content standards and mathematical habits of mind. Students in the second grade will 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. Mathematical habits of mind, which should be integrated in these content areas, include: making sense of problems and persevering in solving them, reasoning abstractly and quantitatively; constructing viable arguments and critiquing the reasoning of others; modeling with mathematics; using appropriate tools strategically; attending to precision, looking for and making use of structure; and looking for and expressing regularity in repeated reasoning. Continuing the skill progressions from first grade, the following chart represents the mathematical understandings that will be developed in second grade:

Operations and Algebraic Thinking	Number and Operations in Base Ten
<ul style="list-style-type: none"> Solve challenging addition and subtraction word problems with one or two steps (e.g., a “one-step” problem would be: “Lucy has 23 fewer apples than Julie. Julie has 47 apples. How many apples does Lucy have?”). Fluently add with a sum of 20 or less (e.g., $11 + 8$); fluently subtract from a number 20 or less (e.g., $16 - 9$); and know all sums of one-digit numbers from memory by the end of the year. Work with equal groups of objects to gain foundations for multiplication. 	<ul style="list-style-type: none"> Understand what the digits mean in three-digit numbers (place value). Use an understanding of place value to add and subtract three-digit numbers (e.g., $811 - 367$); add and subtract two-digit numbers fluently (e.g., $77 - 28$).
Measurement and Data	Geometry
<ul style="list-style-type: none"> Solve addition and subtraction word problems involving length (e.g., “The pen is 2 cm longer than the pencil. If the pencil is 7 cm long, how long is the pen?”). Tell time. Count money. 	<ul style="list-style-type: none"> Build, draw, and analyze 2-D and 3-D shapes to develop foundations for area, volume, and geometry in later grades. Divide shapes into equal shares to build the foundations for fractions in later grades.

Numbering of Standards

The following Mathematics Standards will be numbered continuously. The following ranges relate to the clusters found within Mathematics:

Operations and Algebraic Thinking	
Represent and solve problems involving addition and subtraction.	Standard 1
Add and subtract within 20.	Standard 2
Work with equal groups of objects to gain foundations for multiplication.	Standards 3-4
Number and Operations in Base Ten	
Understand place value.	Standard 5-8
Use place value understanding and properties of operations to add and subtract.	Standards 9-13
Measurement and Data	
Measure and estimate lengths in standard units.	Standards 14-17
Relate addition and subtraction to length.	Standards 18-19
Work with time and money.	Standards 20-21
Represent and interpret data.	Standards 22-23
Geometry	
Reason with shapes and their attributes.	Standards 24-26

Operations and Algebraic Thinking

Cluster	Represent and solve problems involving addition and subtraction.
M.2.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (e.g. by using drawings and equations with a symbol for the unknown number to represent the problem).

Cluster	Add and subtract within 20.
M.2.2	Fluently add and subtract within 20 using mental strategies and by end of Grade 2, know from memory all sums of two one-digit numbers.

Cluster	Work with equal groups of objects to gain foundations for multiplication.
M.2.3	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.
M.2.4	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.

Number and Operations in Base Ten

Cluster	Understand place value.
M.2.5	Understand that the 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). Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens – called a “hundred.”

	b. Numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight or nine hundreds, and 0 tens and 0 ones.
M.2.6	Count within 1000 and skip-count by 5s, 10s and 100s.
M.2.7	Read and write numbers to 1000 using base-ten numerals, number names and expanded form.
M.2.8	Compare two three-digit numbers based on meanings of the hundreds, tens and ones digits, using $>$, $=$ and $<$ symbols to record the results of comparisons.

Cluster	Use place value understanding and properties of operations to add and subtract.
M.2.9	Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.
M.2.10	Add up to four two-digit numbers using strategies based on place value and properties of operations.
M.2.11	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.
M.2.12	Mentally add 10 or 100 to a given number 100-900 and mentally subtract 10 or 100 from a given number 100-900.
M.2.13	Explain why addition and subtraction strategies work, using place value and the properties of operations. Instructional Note: Explanations may be supported by drawing or objects.

Measurement and Data

Cluster	Measure and estimate lengths in standard units.
M.2.14	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
M.2.15	Measure the length of an object twice, using length units of different lengths for the two measurements, describe how the two measurements relate to the size of the unit chosen.
M.2.16	Estimate lengths using units of inches, feet, centimeters, and meters.
M.2.17	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

Cluster	Relate addition and subtraction to length.
M.2.18	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.
M.2.19	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.

Cluster	Work with time and money.
M.2.20	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
M.2.21	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately (e.g., If you have 2 dimes and 3 pennies, how many cents do you have?).

Cluster	Represent and interpret data.
M.2.22	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.
M.2.23	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.

Geometry

Cluster	Reason with shapes and their attributes
M.2.24	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
M.2.25	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
M.2.26	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., describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.