Mathematics – Grade 1

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All West Virginia teachers are responsible for classroom instruction that integrates content standards and mathematical habits of mind. Students in the first grade will focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as repeating length units; and (4) reasoning about attributes of, and composing and decomposing geometric 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 kindergarten, the following chart represents the mathematical understandings that will be developed in first grade:

Operations and Algebraic Thinking	Number and Operations in Base Ten
• Solve addition and subtraction word problems in situations of adding to, taking from, putting together, taking apart, and comparing (e.g., a taking from situation would be: "Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?"). • Add fluently with a sum of 10 or less, and accurately subtract from a number 10 or less (e.g., 2 + 5, 7 – 5). • Understanding the relationship between addition and subtraction.	• Understand what the digits mean in two-digit numbers (place value). • Use understanding of place value and properties of operations to add and subtract (e.g., 38 + 5, 29 + 20, 64 + 27, 80 – 50). • Identify the value of pennies, nickels and dimes.
Measurement and Data	**Geometry**
• Measure lengths of objects by using a shorter object as a unit of length. • Tell and write time.	• Make composite shapes by joining shapes together, and dividing circles and rectangles into halves or fourths.

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.	Standards 1-2
Understand and apply properties of operations and the relationship between addition and subtraction.	Standards 3-4
Add and subtract within 20.	Standards 5-6
Work with addition and subtraction equations.	Standard 7-8
Number and Operations in Base Ten	
Extend the counting sequence.	Standard 9
Understand place value.	Standards 10-11
Use place value understanding and properties of operations to add and subtract.	Standards 12-14
Measurement and Data	
Measure lengths indirectly and by iterating length units.	Standards 15-16
Tell and write time.	Standard 17
Represent and interpret data.	Standard 18
Geometry	
Reason with shapes and their attributes.	Standards 19-21

Operations and Algebraic Thinking

Cluster	Represent and solve problems involving addition and subtraction.
M.1.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem).
M.1.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 (e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem).

Cluster	Understand and apply properties of operations and the relationship between addition and subtraction.
M.1.3	Apply properties of operations as strategies to add and subtract (e.g., If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known: Commutative Property of Addition. To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12: Associative Property of Addition). Instructional Note: Students need not use formal terms for these properties.

M.1.4	Understand subtraction as an unknown-addend problem (e.g., subtract 10 – 8 by finding the number that makes 10 when added to 8).
Cluster	**Add and subtract within 20.**
M.1.5	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
M.1.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10 and use strategies such as - counting on; - making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); - decomposing a number leading to a ten (e.g., $13 – 4 = 13 – 3 – 1 = 10 – 1 = 9$); - using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 – 8 = 4$); and - creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).
Cluster	**Work with addition and subtraction equations.**
M.1.7	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false (e.g., Which of the following equations are true and which are false? $6 = 6$, $7 = 8 – 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$).
M.1.8	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers (e.g., Determine the unknown number that makes the equation true in each of the equations. $8 + ? = 11$, $5 = ? – 3$, $6 + 6 = ?$).

Number and Operations in Base Ten

Cluster	**Extend the counting sequence.**
M.1.9	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
Cluster	**Understand place value.**
M.1.10	Understand the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: <ol type="a"> 10 can be thought of as a bundle of ten ones — called a "ten." (e.g., A group of ten pennies is equivalent to a dime.) - The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight or nine ones. - The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight or nine tens (and 0 ones).
M.1.11	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Cluster	Use place value understanding and properties of operations to add and subtract.
M.1.12	Add within 100, including • adding a two-digit number and a one-digit number and adding a two-digit number and a multiple of 10, • 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones, and sometimes it is necessary to compose a ten.
M.1.13	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count and explain the reasoning used.
M.1.14	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences) 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 and explain the reasoning used.

Measurement and Data

Cluster	Measure lengths indirectly and by iterating length units.
M.1.15	Order three objects by length and compare the lengths of two objects indirectly by using a third object.
M.1.16	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Instructional Note: Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.

Cluster	Tell and write time.
M.1.17	Tell and write time in hours and half-hours using analog and digital clocks.

Cluster	Represent and interpret data.
M.1.18	Organize, represent, interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category and how many more or less are in one category than in another.

Cluster	Reason with shapes and their attributes.
M.1.19	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, and/or overall size); build and draw shapes to possess defining attributes.
M.1.20	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape and compose new shapes from the composite shape. Instructional Note: Students do not need to learn formal names such as, "right rectangular prism."
M.1.21	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths and quarters and use the phrases half of, fourth of and quarter of. Describe the whole as two of, or four of the shares and understand for these examples that decomposing into more equal shares creates smaller shares.