Grade 1 Mathematics Overview

Grade 1 content is organized into five Alabama Content Areas as outlined in the table below: Operations and Algebraic Thinking; Operations with Numbers: Base Ten; Data Analysis; Measurement; and Geometry. Related standards are grouped into clusters, which are listed below each content area. Standards indicate what the student should know or be able to do by the end of the grade.

Alabama Content Areas	Operations and Algebraic Thinking	Operations with Numbers: Base Ten	Data Analysis	Measurement	Geometry
Clusters	• Represent and solve problems involving addition and subtraction. • Understand and apply properties of operations and the relationship between addition and subtraction. • Add and subtract within 20. • Work with addition and subtraction equations. • Understand simple patterns.	• Extend the counting sequence. • Understand place value. • Use place value understanding and properties of operations to add and subtract.	• Collect and analyze data and interpret results.	• Describe and compare measurable attributes. • Work with time and money.	• Reason with shapes and their attributes.

The eight Student Mathematical Practices listed in the chart below represent what students are doing as they learn mathematics. Students should regularly engage in these processes and proficiencies at every level throughout their mathematical studies. Proficiency with these practices is critical in using mathematics, both in the classroom and in everyday life. **The Student Mathematical Practices are standards to be incorporated across all grades**.

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

Content Priorities

In Grade 1, instructional time should 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 iterating length units; and
4. reasoning about attributes of and composing and decomposing geometric shapes.

Important information regarding these four critical areas of instruction follows.

1. Through their learning in the **Operations and Algebraic Thinking** Alabama Content Area, students
   - develop strategies for adding and subtracting whole numbers based on prior work with small numbers;
   - use a variety of models, including concrete objects and length-based models such as cubes connected to form lengths, to model *add-to, take-from, put-together, take-apart,* and *compare* situations as a means of developing meaning for the operations of addition and subtraction and developing strategies to solve arithmetic problems with these operations;
   - understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two);
   - use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties, such as "making tens," to solve addition and subtraction problems within 20;
   - build their understanding of the relationship between addition and subtraction by comparing a variety of solution strategies; and
   - reproduce, extend, and create patterns and sequences of numbers using a variety of materials.
     Note: Reproducing, extending, and creating patterns are important processes in thinking algebraically.

2. Through their learning in the **Operations with Numbers: Base Ten** Alabama Content Area, students
   - develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and to subtract multiples of 10;
   - compare whole numbers, at least to 100, to develop understanding of and solve problems involving their relative sizes;
   - think of whole numbers between 10 and 99 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones); and
   - understand the order of the counting numbers and their relative magnitudes through activities that build number sense.

3. Through their learning in the **Measurement** Alabama Content Area, students
   - develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement; and
   - work with time and money.

Note: Students should apply the principle of transitivity of measurement to make indirect comparisons, although they need not use this technical term.

4. Through their learning in the **Geometry** Alabama Content Area, students
   - compose and decompose plane or solid figures, including putting two triangles together to make a quadrilateral, and build understanding of part-whole relationships as well as the properties of the original and composite shapes; and
   - combine shapes, recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and initial understandings of properties such as congruence and symmetry for use in later grades.

NOTE: Although not all content areas in the grade level have been included in the overview, all standards should be included in instruction.

Grade 1 Content Standards

Each content standard completes the stem *"Students will…"*

Operations and Algebraic Thinking	
Represent and solve problems involving addition and subtraction. *Note: Students use properties of operations and different strategies to find the sum of three whole numbers, such as counting on, making tens, decomposing numbers, doubles, and near doubles.*	1. Use addition and subtraction to solve word problems within 20 by using concrete objects, drawings, and equations with a symbol for the unknown number to represent the problem. a. Add to with change unknown to solve word problems within 20. b. Take from with change unknown to solve word problems within 20. c. Put together/take apart with addend unknown to solve word problems within 20. d. Compare quantities, with difference unknown, bigger unknown, and smaller unknown while solving word problems within 20. 2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 by using concrete objects, drawings, or equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction. *Note: Students need not use formal terms for these properties.*	3. Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known (commutative property of addition).* *To add 2 + 6 + 4, the second and third numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12 (associative property of addition).* *When adding 0 to a number, the result is the same number (identity property of zero for addition).* 4. Explain subtraction as an unknown-addend problem. *Example: subtracting 10 - 8 by finding the number that makes 10 when added to 8*
Add and subtract within 20. *Note: Fluency involves a mixture of "just knowing" answers, knowing answers from patterns, and knowing answers from the use of strategies. The word* fluently *is used in the standards to mean accurately, efficiently, and flexibly.*	5. Relate counting to addition and subtraction. *Example: counting on 2 to add 2* 6. Add and subtract within 20. a. Demonstrate fluency with addition and subtraction facts with sums or differences to 10 by counting on. b. Demonstrate fluency with addition and subtraction facts with sums or differences to 10 by making ten. c. Demonstrate fluency with addition and subtraction facts with sums or differences to 10 by decomposing a number leading to a ten. *Example: 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9* d. Demonstrate fluency with addition and subtraction facts with sums or differences to 10 by using the relationship between addition and subtraction. *Example: Knowing that 8 + 4 = 12, one knows 12 - 8 = 4.* e. Demonstrate fluency with addition and subtraction facts with sums or differences to 10 by creating equivalent but easier or known sums. *Example: adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13*
Work with addition and subtraction equations.	7. Explain that the equal sign means "the same as." Determine whether equations involving addition and subtraction are true or false. *Example: determining which of the following equations are true and which are false: 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2* 8. Solve for the unknown whole number in various positions in an addition or subtraction equation, relating three whole numbers that would make it true. *Example: determining the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = ? – 3, and 6 + 6 = ?*

Understand simple patterns.	9. Reproduce, extend, and create patterns and sequences of numbers using a variety of materials.

Operations with Numbers: Base Ten	
Extend the counting sequence.	10. Extend the number sequence from 0 to 120. a. Count forward and backward by ones, starting at any number less than 120. b. Read numerals from 0 to 120. c. Write numerals from 0 to 120. d. Represent a number of objects from 0 to 120 with a written numeral.
Understand place value.	11. Explain that the two digits of a two-digit number represent amounts of tens and ones. a. Identify a bundle of ten ones as a "ten." b. Identify the numbers from 11 to 19 as composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. Identify the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 as one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones). 12. Compare pairs of two-digit numbers based on the values of the tens and ones digits, recording the results of comparisons with the symbols >, =, and < and orally with the words "is greater than," "is equal to," and "is less than."
Use place value understanding and properties of operations to add and subtract.	13. Add within 100, using concrete models or drawings and strategies based on place value. a. Add a two-digit number and a one-digit number. b. Add a two-digit number and a multiple of 10. c. Demonstrate that in adding two-digit numbers, tens are added to tens, ones are added to ones, and sometimes it is necessary to compose a ten. d. Relate the strategy for adding a two-digit number and a one-digit number to a written method and explain the reasoning used. 14. Given a two-digit number, mentally find 10 more or 10 less than the number without having to count, and explain the reasoning used. 15. Subtract multiples of 10 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.

Data Analysis	
Collect and analyze data and interpret results.	16. Organize, represent, and interpret data with up to three categories. a. Ask and answer questions about the total number of data points in organized data. b. Summarize data on Venn diagrams, pictographs, and "yes-no" charts using real objects, symbolic representations, or pictorial representations. c. Determine “how many” in each category using up to three categories of data. d. Determine “how many more” or “how many less” are in one category than in another using data organized into two or three categories.

Measurement	
Describe and compare measurable attributes.	17. Order three objects by length; compare the lengths of two objects indirectly by using a third object. 18. Determine the length of an object using non-standard units with no gaps or overlaps, expressing the length of the object with a whole number.
Work with time and money.	19. Tell and write time to the hours and half hours using analog and digital clocks. 20. Identify pennies and dimes by name and value.

Geometry	
Reason with shapes and their attributes. *Note: Students do not need to learn formal names such as “right rectangular prism.”*	21. Build and draw shapes which have defining attributes. a. Distinguish between defining attributes and non-defining attributes. *Examples: Triangles are closed and three- sided, which are defining attributes; color, orientation, and overall size are non-defining attributes.* 22. 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.

	23. Partition circles and rectangles into two and four equal shares and describe the shares using the words *halves, fourths,* and *quarters,* and use the phrases *half of, fourth of,* and *quarter of*. a. Describe "the whole" as two of or four of the shares of circles and rectangles partitioned into two or four equal shares. b. Explain that decomposing into more equal shares creates smaller shares of circles and rectangles.