Kindergarten Mathematics Overview

Kindergarten content is organized into six Alabama Content Areas as outlined in the table below: Foundations of Counting; 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	Foundations of Counting	Operations and Algebraic Thinking	Operations with Numbers: Base Ten	Data Analysis	Measurement	Geometry
Clusters	• Know number names and the count sequence. • Count to tell the number of objects. • Compare numbers.	• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. • Understand simple patterns.	• Work with numbers 11-19 to gain foundations for place value.	• Collect and analyze data and interpret results.	• Describe and compare measurable attributes.	• Identify and describe shapes. • Analyze, compare, create, and compose shapes.

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, 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 kindergarten, instructional time should focus on two critical areas:

1. developing a sound sense of numbers by representing and comparing numbers, using sets of objects; and
2. recognizing and describing shapes and using spatial relations.

The majority of learning time should be focused on number sense.

1. Through their learning in the **Foundations of Counting** and **Operations and Algebraic Thinking** Alabama Content Areas, students
   - develop a formal sense of numbers including number sequence, one-to-one correspondence, cardinality, and subitizing;
   - use numbers, including written numerals, to represent quantities and to solve quantitative problems such as counting objects in a set, counting out a given number of objects, comparing sets or numerals, and modeling simple joining and separating situations with sets of objects, eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5. (*Note: Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but not required*.);
   - choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away; and
   - duplicate and extend simple patterns by using concrete objects.
     (Note: Looking for, duplicating, and extending patterns are important processes in thinking algebraically.)

2. Through their learning in the **Geometry** and **Measurement** Alabama Content Areas, students
   - describe objects in their physical world using both mathematical vocabulary and geometric ideas;
   - identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., in different sizes and orientations);
   - identify three-dimensional shapes such as cubes, cones, cylinders, and spheres;
   - use basic shapes and spatial reasoning to model objects in their environment to create and compose more complex shapes; and
   - explore pennies.
     (Note: The term explore *indicates that the topic is an important concept which builds the foundation for progression toward mastery in later grades.)*

When standards indicate that drawings may be used, the drawings need not be detailed but should show the mathematics in the problem.

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

Kindergarten Content Standards

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

Foundations of Counting	
Know number names and the count sequence. *Note on number reversals: Learning to write numerals is generally more difficult than learning to read them. It is common for students to reverse numerals at this stage.*	1. Count forward orally from 0 to 100 by ones and by tens. Count backward orally from 10 to 0 by ones. 2. Count to 100 by ones beginning with any given number between 0 and 99. 3. Write numerals from 0 to 20. a. Represent 0 to 20 using concrete objects when given a written numeral from 0 to 20 (with 0 representing a count of no objects).
Count to tell the number of objects.	4. Connect counting to cardinality using a variety of concrete objects. a. Say the number names in consecutive order when counting objects. b. Indicate that the last number name said tells the number of objects counted in a set. c. Indicate that the number of objects in a set is the same regardless of their arrangement or the order in which they were counted. d. Explain that each successive number name refers to a quantity that is one larger. 5. Count to answer "how many?" questions. a. Count using no more than 20 concrete objects arranged in a line, a rectangular array, or a circle. b. Count using no more than 10 concrete objects in a scattered configuration. c. Draw the number of objects that matches a given numeral from 0 to 20.
Compare numbers.	6. Orally identify whether the number of objects in one group is *greater/more than, less/fewer than,* or *equal/the same as* the number of objects in another group, in groups containing up to 10 objects, by using matching, counting, or other strategies. 7. Compare two numbers between 0 and 10 presented as written numerals (without using inequality symbols).

Operations and Algebraic Thinking	
Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. **Note: Drawings need not be detailed but should show the mathematics in the problem.*	8. Represent addition and subtraction up to 10 with concrete objects, fingers, pennies, mental images, drawings, claps or other sounds, acting out situations, verbal explanations, expressions, or equations. 9. Solve addition and subtraction word problems, and add and subtract within 10, by using concrete objects or drawings to represent the problem. 10. Decompose numbers less than or equal to 10 into pairs of smaller numbers in more than one way, by using concrete objects or drawings, and record each decomposition by a drawing or equation. *Example: 5 = 2 + 3 and 5 = 4 + 1* 11. For any number from 0 to 10, find the number that makes 10 when added to the given number, by using concrete objects or drawings, and record the answer with a drawing or equation. 12. Fluently add and subtract within 5.
Understand simple patterns.	13. Duplicate and extend simple patterns using concrete objects.

Operations with Numbers	
Work with numbers 11-19 to gain foundations for place value.	14. Compose and decompose numbers from 11 to 19 by using concrete objects or drawings to demonstrate understanding that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Data Analysis	
Collect and analyze data and interpret results.	15. Classify objects into given categories of 10 or fewer; count the number of objects in each category and sort the categories by count. a. Categorize data on Venn diagrams, pictographs, and "yes-no" charts using real objects, symbolic representations, or pictorial representations.

Measurement	
Describe and compare measurable attributes.	16. Identify and describe measurable attributes (length, weight, height) of a single object using vocabulary such as *long/short, heavy/light,* or *tall/short*. 17. Directly compare two objects with a measurable attribute in common to see which object has "more of" or "less of" the attribute and describe the difference. *Example: Directly compare the heights of two children and describe one child as "taller" or "shorter."*

Geometry	
Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).	18. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind*, and *next to*. 19. Correctly name shapes regardless of their orientations or overall sizes. 20. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").
Analyze, compare, create, and compose shapes.	21. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (number of sides and vertices or "corners"), and other attributes. *Example: having sides of equal length* 22. Model shapes in the world by building them from sticks, clay balls, or other components and by drawing them. 23. Use simple shapes to compose larger shapes. *Example: Join two triangles with full sides touching to make a rectangle.*