Grade 3 Overview

Grade 3 content is organized into six Alabama Content Areas of study as outlined in the table below: Operations and Algebraic Thinking; Operations with Numbers: Base Ten; Operations with Numbers: Fractions; 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	Operations with Numbers: Fractions	Data Analysis	Measurement	Geometry
Clusters	• Represent and solve problems involving multiplication and division. • Understand properties of multiplication and the relationship between multiplication and division. • Multiply and divide within 100. • Solve problems involving the four operations, and identify and explain patterns in arithmetic.	• Use place value understanding and properties of operations to perform multi-digit arithmetic.	• Develop understanding of fractions as numbers.	• Represent and interpret data.	• Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. • Geometric measurement: understand concepts of area and relate area to multiplication and addition. • Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	• 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 should be regarded as 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 3, instructional time should focus on four critical areas:

1. developing understanding of multiplication and division and strategies for multiplication and division within 100;
2. developing understanding of fractions, especially unit fractions (fractions with numerator 1);
3. developing understanding of the structure of rectangular arrays and of area; and
4. describing and analyzing two-dimensional shapes.

1. Through their learning in the **Operations and Algebraic Thinking** Alabama Content Area, students
   - develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size;
   - use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors; and
   - compare a variety of solution strategies, to learn the relationship between multiplication and division.

2. Through their learning in the **Operations with Numbers: Fractions** Alabama Content Area, students
   - develop an understanding of fractions, beginning with unit fractions;
   - view fractions in general as being composed of unit fractions, and use fractions along with visual fraction models such as area models, fraction strips, and number lines to represent parts of a whole;
   - understand that the size of a fractional part is relative to the size of the whole, and use fractions to represent numbers equal to, less than, and greater than one; and
   - solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.

3. Through their learning in the **Measurement** Alabama Content Area, students
   - recognize area as an attribute of two-dimensional regions;
   - measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area; and
   - understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication and justify using multiplication to determine the area of a rectangle.

4. Through their learning in the **Geometry** Alabama Content Area, students
   - extend knowledge of polygons to describe, analyze, and compare properties of two-dimensional shapes; and
   - recognize shapes that are/are not quadrilaterals by using informal language to classify shapes by sides and angles, and connect these with the names of the shapes.

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

***Note: fluency vs. automaticity.** 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. Automaticity of facts becomes evident when a student no longer uses a pattern or mental algorithm to determine the answer.

Grade 3 Content Standards

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

Operations and Algebraic Thinking	
Represent and solve problems involving multiplication and division.	1. Illustrate the product of two whole numbers as equal groups by identifying the number of groups and the number in each group and represent as a written expression. 2. Illustrate and interpret the quotient of two whole numbers as the number of objects in each group or the number of groups when the whole is partitioned into equal shares. 3. Solve word situations using multiplication and division within 100 involving equal groups, arrays, and measurement quantities; represent the situation using models, drawings, and equations with a symbol for the unknown number. 4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Understand properties of multiplication and the relationship between multiplication and division. *Note: Students need not use formal terms for these properties.*	5. Develop and apply properties of operations as strategies to multiply and divide. 6. Use the relationship between multiplication and division to represent division as an equation with an unknown factor.
Multiply and divide within 100.	7. Use strategies based on properties and patterns of multiplication to demonstrate fluency with multiplication and division within 100. a. Fluently determine all products obtained by multiplying two one-digit numbers. b. State automatically all products of two one-digit numbers by the end of third grade.
Solve problems involving the four operations and identify and explain patterns in arithmetic.	8. Determine and justify solutions for two-step word problems using the four operations and write an equation with a letter standing for the unknown quantity. Determine reasonableness of answers using number sense, context, mental computation, and estimation strategies including rounding. 9. Recognize and explain arithmetic patterns using properties of operations.

Operations with Numbers: Base Ten	
Use place value understanding and properties of operations to perform multi-digit arithmetic.	10. Identify the nearest 10 or 100 when rounding whole numbers, using place value understanding. 11. Use various strategies to add and subtract fluently within 1000. 12. Use concrete materials and pictorial models based on place value and properties of operations to find the product of a one-digit whole number by a multiple of ten (from 10 to 90).

Operations with Numbers: Fractions	
Develop understanding of fractions as numbers. *Denominators are limited to 2, 3, 4, 6, and 8.*	13. Demonstrate that a unit fraction represents one part of an area model or length model of a whole that has been equally partitioned; explain that a numerator greater than one indicates the number of unit pieces represented by the fraction. 14. Interpret a fraction as a number on the number line; locate or represent fractions on a number line diagram. a. Represent a unit fraction ($\frac{1}{b}$) on a number line by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts as specified by the denominator. b. Represent a fraction ($\frac{a}{b}$) on a number line by marking off *a* lengths of size ($\frac{1}{b}$) from zero. 15. Explain equivalence and compare fractions by reasoning about their size using visual fraction models and number lines. a. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. b. Compare two fractions with the same numerator or with the same denominator by reasoning about their size (recognizing that fractions must refer to the same whole for the comparison to be valid). Record comparisons using < , >, or = and justify conclusions.

Data Analysis	
Represent and interpret data.	16. For a given or collected set of data, create a scaled (one-to-many) picture graph and scaled bar graph to represent a data set with several categories. a. Determine a simple probability from a context that includes a picture. b. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled graphs. 17. Measure lengths using rulers marked with halves and fourths of an inch to generate data and create a line plot marked off in appropriate units to display the data.

Measurement	
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	18. Tell and write time to the nearest minute; measure time intervals in minutes (within 90 minutes.) a. Solve real-world problems involving addition and subtraction of time intervals in minutes by representing the problem on a number line diagram. 19. Estimate and measure liquid volumes and masses of objects using liters (l), grams (g), and kilograms (kg). a. Use the four operations to solve one-step word problems involving masses or volumes given in the same metric units.
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	20. Find the area of a rectangle with whole number side lengths by tiling without gaps or overlays and counting unit squares. 21. Count unit squares (square cm, square m, square in, square ft, and improvised or non-standard units) to determine area. 22. Relate area to the operations of multiplication using real-world problems, concrete materials, mathematical reasoning, and the distributive property. 23. Decompose rectilinear figures into smaller rectangles to find the area, using concrete materials.
Geometric measurement: Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	24. Construct rectangles with the same perimeter and different areas or the same area and different perimeters. 25. Solve real-world problems involving perimeters of polygons, including finding the perimeter given the side lengths and finding an unknown side length of rectangles.

Geometry	
Reason with shapes and their attributes.	26. Recognize and describe polygons (up to 8 sides), triangles, and quadrilaterals (rhombuses, rectangles, and squares) based on the number of sides and the presence or absence of square corners. a. Draw examples of quadrilaterals that are and are not rhombuses, rectangles, and squares.