



# Alabama Achievement Level Descriptors

## Grade 5 – Mathematics

The descriptions below provide a brief summary of typical performance for each level. The skills identified in each descriptor represent, but are not all-inclusive of, the skills a student should be able to demonstrate at each achievement level.

	Level 1: Emerging Learner	Level 2: Developing Learner	Level 3: Proficient Learner	Level 4: Distinguished Learner
<b>Operations and Algebraic Thinking</b>	<ul style="list-style-type: none"> <li>▪ Evaluates using order of operations without parenthesis.</li> <li>▪ Generates a numerical pattern given a rule.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Evaluates simple numerical expressions using parentheses and brackets.</li> <li>▪ Matches simple descriptions with their numerical expressions and numerical expressions with their descriptions.</li> <li>▪ Expresses some relationships between terms in two given numerical patterns.</li> <li>▪ Graphs points from two numerical patterns in quadrant 1 of a coordinate plane.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Uses parentheses, brackets, or braces in numerical expressions, and evaluates expressions with these symbols.</li> <li>▪ Writes and interprets simple numerical expressions.</li> <li>▪ Generates two numerical patterns using two given rules.</li> <li>▪ Identifies apparent relationships between corresponding terms in two numerical patterns and plots the results as ordered pairs in quadrant 1 of a coordinate plane.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fluently writes and evaluates expressions involving multiple sets of parentheses, including from a real-world problem.</li> <li>▪ Analyzes two numerical patterns for relationships between corresponding terms and describes their relationship using mathematical terms, expressions, or equations.</li> </ul>



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<b>Number and Operations in Base Ten</b>	<ul style="list-style-type: none"> <li>▪ Recognizes that in a multi-digit whole number the place value of any digit represents 10 times as much as the place value of the digit to the right.</li> <li>▪ Reads and identifies the decimal number to hundredths with the greatest or the least value.</li> <li>▪ Interprets a given model representing a decimal to the hundredths place.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recognizes and explains the patterns in the number of zeros in a whole-number product when multiplying by powers of 10.</li> <li>▪ Reads, writes, and compares decimal numbers to hundredths.</li> <li>▪ Constructs a model, such as a number line, to round decimals to the hundredths place.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recognizes that in a multi-digit number the place value of any digit represents 10 times as much as the place to its right and 1/10 times as much as the place value of the digit to the left.</li> <li>▪ Recognizes and explains patterns in placement of the decimal point when multiplying or dividing by powers of 10.</li> <li>▪ Uses whole-number exponents to denote powers of 10.</li> <li>▪ Reads, writes, and compares decimals to the thousandths place.</li> <li>▪ Uses place value understanding to round decimals to any place.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Compares numbers written in expanded or standard form.</li> <li>▪ Uses symbols to compare two powers of 10 expressed with exponents.</li> <li>▪ Fluently calculates with multi-digit whole numbers involving all four operations.</li> <li>▪ Rounds decimal numbers to any place value and explains using place value understanding.</li> </ul>



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<b>Number and Operations in Base Ten</b>	<ul style="list-style-type: none"> <li>▪ Multiplies three-digit by one-digit or two two-digit numbers.</li> <li>▪ Adds or subtracts with decimals to the tenths.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Multiplies three-digit by two-digit numbers.</li> <li>▪ Finds whole-number quotients of whole numbers with up to three-digit dividends and two-digit divisors.</li> <li>▪ Adds or subtracts with decimals to the hundredths.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Uses standard algorithms to fluently multiply multi-digit whole numbers.</li> <li>▪ Finds whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.</li> <li>▪ Adds, subtracts, multiplies, and divides with decimals to the hundredths.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fluently illustrates and explains multiplication and division calculations by using equations, rectangular arrays, and/or area models.</li> <li>▪ Solves multi-step calculations involving decimals to hundredths accurately and efficiently.</li> </ul>



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<b>Number and Operations – Fractions</b>	<ul style="list-style-type: none"> <li>▪ Adds fractions with like denominators given a visual model such as fraction bars.</li> <li>▪ Multiplies a fraction by a fraction with a visual model only.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Solves mathematical problems, involving addition and subtraction of fractions and mixed numbers with some unlike denominators (2, 5, 10).</li> <li>▪ Identifies or evaluates a model to show equivalent fractions.</li> <li>▪ Multiplies fractions by fractions.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adds and subtracts fractions with unlike denominators, in mathematical and word problems, by replacing given fractions with equivalent fractions.</li> <li>▪ Solves word problems involving addition and subtraction of fractions using visual fraction models or equations to represent the problem.</li> <li>▪ Interprets a fraction as division of the numerator by the denominator (<math>a/b = a \div b</math>).</li> <li>▪ Solves word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.</li> <li>▪ Multiplies fractions by fractions and fractions by whole numbers and interprets products.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Makes sense of a real-world problem using addition and subtraction of fractions and mixed numbers with unlike denominators to find and justify the solution.</li> <li>▪ Makes sense of multi-step problems involving several related parts of a whole.</li> </ul>



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<b>Number and Operations – Fractions</b>		<ul style="list-style-type: none"> <li>▪ Recognizes that a product of two fractions can be represented by a rectangle with fractional side lengths, shown with unit squares.</li> <li>▪ Divides a fraction by a whole number or a whole number by a fraction, given visual models only.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Finds area of a rectangle with fractional side lengths by tiling with unit squares and shows that area is the same as multiplication.</li> <li>▪ Demonstrates understanding of and explains why multiplying by a fraction between 0 and 1 results in a product smaller than the original whole number.</li> <li>▪ Computes and interprets quotients of unit fractions by whole numbers and whole numbers by unit fractions, including in real world problems.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Represents situations involving division with a fraction.</li> </ul>



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<b>Measurement and Data</b>	<ul style="list-style-type: none"> <li>▪ Identifies the correct conversion among different-sized standard units within a given measurement system.</li> <li>▪ Represents some fractional (1/2, 1/4) data sets in line plots.</li> <li>▪ Calculates volume with manipulatives by packing a solid figure with unit cubes or by counting the unit cubes that fill a solid.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Converts among different-sized standard measurement units within a given measurement system and solves single-step real-world problems by using visual models.</li> <li>▪ Represents fractional (1/2, 1/4, 1/8) data sets in line plots.</li> <li>▪ Counts unit cubes to find the volumes of composite right rectangular prisms.</li> <li>▪ Solves one-step mathematical and real-world problems involving volume of right rectangular prisms.</li> <li>▪ Calculates the volume of a rectangular prism by applying the formula <math>V = lwh</math> given a visual model.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Converts among different-sized standard measurement units within a given measurement system and uses them to solve multi-step real-world problems.</li> <li>▪ Represents fractional (1/2, 1/4, 1/8) data sets in line plots and solves problems involving information presented in those line plots.</li> <li>▪ Recognizes volume as an attribute of solid figures and that a cube with side lengths of 1 unit is a unit cube and has a volume of 1 cubic unit.</li> <li>▪ Demonstrates understanding of concepts of volume measurement.</li> <li>▪ Measures volumes by counting cubes and applying formulas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Fluently converts among the units within a given measurement system in order to solve multi-step real-world or mathematical problems.</li> <li>▪ Solves complex problems involving information presented in line plots created from fractional data sets, including mixed numbers.</li> <li>▪ Relates volume to the operations of addition and multiplication when analyzing volume calculations.</li> </ul>



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Measurement and Data		<ul style="list-style-type: none"><li>Recognizes that volume can be calculated by multiplying the edge lengths, or by multiplying the height by the area of the base.</li></ul>	<ul style="list-style-type: none"><li>Calculates the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and shows that the volume is the same as multiplying the edge lengths, or by multiplying the height by the area of the base.</li><li>Recognizes volume as additive, calculates volume of figures composed of two non-overlapping prisms.</li></ul>	<ul style="list-style-type: none"><li>Solves multi-step mathematical and real-world problems involving the volume of a composite figure composed of two or more non-overlapping right rectangular prisms and justifies conclusions.</li></ul>



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<b>Geometry</b>	<ul style="list-style-type: none"> <li>▪ Recognizes a coordinate plane is used to graph coordinates and can identify the origin.</li> <li>▪ Identifies triangles, squares, rectangles, and trapezoids.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Graphs the coordinates of the order pair for a given point in the first quadrant of the coordinate plane.</li> <li>▪ Classifies triangles as isosceles, equilateral, scalene, right, acute, and/or obtuse.</li> <li>▪ Classifies parallelograms, squares, rhombuses, and rectangles based on their properties.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Demonstrates an understanding of the coordinate system for graphing and identifies the coordinates of the ordered pair for a given point in the first quadrant of the coordinate plane.</li> <li>▪ Represents real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interprets coordinate values of points in the context of the situation.</li> <li>▪ Recognizes that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.</li> <li>▪ Classifies and compares triangles, squares, rectangles, rhombuses, parallelograms, kites, and trapezoids based on their properties.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Creates a graph to model a real-world problem on a coordinate plane and then interprets a value.</li> <li>▪ Uses properties to explain and justify the classifications of polygons.</li> <li>▪ Constructs a viable argument to justify the classification of polygons by using clear definitions and examples.</li> <li>▪ Constructs a viable argument to classify and compare triangles and quadrilaterals based on their properties.</li> </ul>