Performance Level Descriptors

Mathematics

Grade 8

Performance Level Descriptors (PLDs)				
	Level 1	**Level 2**	**Level 3**	**Level 4**
Policy Statement	The student has a minimal understanding of grade-level standards and needs additional support at this level of learning as described in the Alabama Course of Study.	The student has a partial understanding of grade-level standards and is likely to need some additional support at this level of learning as described in the Alabama Course of Study.	The student has a strong understanding of grade-level standards and demonstrates the knowledge and skills at this level of learning as described in the Alabama Course of Study.	The student has an advanced understanding of grade-level standards and exceedingly demonstrates the knowledge and skills at this level of learning as described in the Alabama Course of Study.
The performance level descriptors describe what a typical student scoring at each performance level can do. A student who scores at a level would be expected to also be able to demonstrate the skills described in previous levels. A student would not necessarily demonstrate all the skills listed at a particular performance level on a particular test in order to score at that level.				
Number Systems and Operations				
8.NSO.1 8.NSO.1a 8.NSO.1b 8.NSO.2	**A student at this level** • recognizes irrational numbers as a category distinct from rational numbers.	**A student at this level** • identifies examples of irrational numbers and • plots an approximation of an irrational number on a number line.	**A student at this level** • converts a decimal expansion that repeats into a rational number and • orders and plots approximations of irrational numbers on a number line.	**A student at this level** • estimates the value of an irrational number to tenths.

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Algebra and Functions				
8.AF.3 8.AF.4 8.AF.4a 8.AF.4b 8.AF.5 8.AF.6 8.AF.6a 8.AF.6b 8.AF.7 8.AF.8 8.AF.8a 8.AF.9 8.AF.9a 8.AF.9b 8.AF.9c 8.AF.9d 8.AF.10 8.AF.11 8.AF.11a 8.AF.11b 8.AF.12 8.AF.12a 8.AF.12b 8.AF.13 8.AF.14 8.AF.15 8.AF.15a 8.AF.16 8.AF.16a 8.AF.17	**A student at this level** • chooses units of appropriate size for measurements of very large or small quantities; • interprets the unit rate as the slope of a proportional relationship represented in a graph; • finds the slope and *y*-intercept of a line using a graph; and	**A student at this level** • determines whether expressions are equivalent using properties of integer exponents; • evaluates square roots of small perfect squares and cube roots of small perfect cubes; • represents quantities in scientific notation; • graphs proportional relationships and compares proportional and non-proportional relationships represented in the same way; • derives the equation $y=mx$ for a proportional relationship;	**A student at this level** • understands and applies the properties of integer exponents to generate equivalent numerical and algebraic expressions; • uses square root and cube root symbols to represent solutions to equations; • performs operations with numbers expressed in scientific notation; • graphs proportional relationships and compares proportional and non-proportional relationships represented in different ways; • explains why the slope of a non-vertical line is the same between any two points and derives the equation $y = mx + b$ for the line; • represents and solves multi-step linear equations in one variable and with rational number coefficients;	**A student at this level** • applies multiple properties of integer exponents to generate equivalent numerical and algebraic expressions,

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	• distinguishes between relations that are functions and relations that are not functions and distinguishes between linear and non-linear functions.	• understands that a solution to a system of two linear equations in two variables corresponds to the point(s) of intersection of their graphs; • identifies and defines linear functions; and • determines the rate of change and initial value of a linear function.	• understands when linear equations in one variable have one solution, no solution, or infinitely many solutions; • solves systems of two linear equations in two variables using graphing and substitution and interprets the results to solve real-world and mathematical problems; • defines, evaluates, and compares functions in multiple representations; • constructs and interprets functions to model linear relationships between two variables; and • analyzes the relationship between two quantities represented in a graph.	• identifies systems of two linear equations in two variables that have one solution, no solution, or infinitely many solutions, and • evaluates, compares, and analyzes functions that model non-linear relationships between quantities in multiple representations.

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Data Analysis, Statistics, and Probability				
8.DSP.18 8.DSP.19 8.DSP.20 8.DSP.20a 8.DSP.21	**A student at this level** • interprets a single point on a scatter plot and • uses a two-way table to identify information about bivariate categorical data.	**A student at this level** • recognizes and describes associations in a scatter plot for bivariate quantitative data, • knows that straight lines model relationships between two quantities and informally fits a straight line to the data, and • calculates relative frequencies from two-way tables.	**A student at this level** • constructs and interprets scatter plots for bivariate quantitative data, • uses linear models to solve problems in the context of the data, describing the rate of change (slope) and *y*-intercept, and • constructs and interprets two-way tables summarizing bivariate data between two categorical variables and describes possible associations between the variables.	**A student at this level** • recognizes when bivariate data is quantitative or categorical and uses an appropriate graphical display and • makes predictions from linear models of real-world situations.

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Geometry and Measurement				
8.GM.22 8.GM.22a 8.GM.23 8.GM.24 8.GM.25 8.GM.25a 8.GM.26 8.GM.27 8.GM.28 8.GM.29 8.GM.30	**A student at this level**	**A student at this level**	**A student at this level**	**A student at this level**
	• recognizes congruence and similarity and distinguishes between them using physical models;	• recognizes and identifies congruence and similarity through multiple transformations;	• understands, analyzes, and justifies congruence and similarity through translations, reflections, rotations, and dilations;	
	• understands the properties and vocabulary of rotations, reflections, translations, and dilations;	• recognizes single transformations;	• describes the effect of transformation(s) on two-dimensional figures;	
	• identifies congruent angles when two parallel lines are cut by a transversal; and	• understands properties of angles formed when parallel lines are cut by a transversal; and	• applies properties of parallel lines cut by a transversal to find unknown angles and show that the sum of the angles in a triangle is 180 degrees;	
	• understands the relationship of side lengths in a right triangle using the Pythagorean theorem.	• finds the hypotenuse of a right triangle with a Pythagorean triple.	• understands and applies the Pythagorean theorem and its converse in real-world and mathematical problems; and	• justifies an informal proof of the Pythagorean theorem and its converse, • applies the Pythagorean theorem in three dimensions and in triangles with irrational side lengths, and
			• uses formulas to find the exact (using π) or approximate (using 3.14) volumes of cones, cylinders, and spheres to solve real-world problems.	• understands the relationships between the volumes of cones, cylinders, and spheres with the same height (diameter) and radius.

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