Eighth Grade Benchmarks
Mathematics

Level 5 – Student performance exceeds year-end standard
Level 4 – Student performance meets year-end standard
Level 3 – Student performance approaches year-end standard
Level 2 – Student demonstrates limited performance to year-end standard
Level 1 – Student does not yet evidence understanding or application of skills related to year-end standard
NOTE: MPI and MPII performance levels are determined based on performance expectations at the time of reporting

Student Performance Standard	**Level 1 Below**	**Level 2 Limited**	**Level 3 Approaches**	**Level 4 Meets**	**Level 5 Exceeds**
The Number System:					
Know that there are numbers that are not rational, and approximate them by rational numbers.	Identifies numbers as either rational or irrational with guidance and support.	Recalls the definition of irrational number; identifies square roots of numbers and π as irrational.	Explains why some radicals are irrational numbers and estimates their value using rational numbers; converts repeating decimals to fractions.	Uses rational approximations of irrational numbers to locate them on a number line to make numerical comparisons; converts repeating decimals to fractions; compares rational numbers in context.	Approximates irrational numbers to a specified level of precision by hand and uses those approximations to solve problems or to estimate the value of an expression.
Expressions and Equations:					
Solve problems involving radicals and integer exponents.	Calculates square roots of perfect squares with guidance and support.	Calculates square roots of perfect squares and squares of integers; translates between standard form and scientific notation.	Calculates square and cube roots and squares and cubes of integers; translates between standard form and scientific notation; applies single properties of integer exponents to simplify expressions.	Calculates irrational square and cube roots to an appropriate level of precision; performs all operations on scientific notation; applies all properties of integer exponents to simplify expressions.	Fluently uses scientific notation to choose units of appropriate size for real-life measurements; solves binomial quadratic and cubic equations and represents the solution as a square or cube root.
Understand and interpret proportional relationships.	Graphs proportional relationships within a scaffolded task with guidance.	Independently graphs a proportional relationship from a table or equation.	Compares two proportional relationships presented in different ways; calculates slopes of lines and	Applies concepts of slope and y-intercept to write equations and solve real-world problems; uses right triangles to find	Uses similar triangles to explain why slopes are the same between any two distinct points on a non-vertical line.

			identifies y-intercepts in equations.	slopes of lines.	
Analyze and solve linear equations and 2-variable systems.	Solves linear equations in one variable with integer coefficients with prompts.	Independently solves linear equations in one variable with integer coefficients.	Solves linear equations in one variable with rational coefficients; solves systems of equations by graphing two lines and interpreting their intersection as a solution.	Solves linear equations and approximates solutions using multiple approaches; classifies equations and systems of linear equations based on number of solutions.	Analyzes and solves problems that lead to systems of linear equations in multiple representations.

Functions:					
Define, evaluate and compare linear functions; construct functions to model a linear relationship.	Identifies linear functions from graphs with support.	Identifies linear functions by examining graphs independently.	Constructs graphs and tables to represent linear relationships; finds slopes in graphs and tables; describes graphs of functions.	Constructs and compares functions from various representations; describes and calculates slopes and y-intercepts using various methods; describes and examines linear and nonlinear functions.	Interprets slopes and y-intercepts in terms of the situation they model and in terms of graphs and tables of values.

Geometry:					
Understand congruence and similarity.	Identifies transformations of shapes with scaffolding and prompts.	Identifies and describes transformations of shapes independently.	Performs transformations of shapes on a coordinate plane and identifies results of dilations.	Understands and describes transformations of shapes with and without a coordinate plane; describes transformations of shapes to determine congruence.	Describes similarity as a result of transformations and understands that those results keep all angle measures unchanged.
Explain and apply the Pythagorean Theorem.	Identifies legs and hypotenuse of right triangles with support.	Identifies legs and hypotenuse of right triangles given the side lengths or an image independently.	Applies the Pythagorean Theorem to determine whether a triangle is right; finds distances between two points on a	Applies the Pythagorean Theorem to determine lengths of missing sides and to find distances between points on a	Applies the Pythagorean Theorem to find distances between points in three-dimensional systems.

			coordinate plane.	coordinate plane; explains the proof of the Theorem.	
Solve problems involving volume of cylinders, cones and spheres.	Identifies elements of cylinders, cones, and spheres with support.	Identifies elements of cylinders, cones, and spheres independently.	Recalls appropriate volume formulas for cylinders, cones, and spheres, and uses them to find volumes.	Calculates volumes of cylinders, cones, and spheres to solve real-world problems.	Manipulates formulas for volume of cylinders, cones, and spheres to solve unfamiliar or multi-step problems with missing dimensions.

Statistics and Probability:					
Investigate patterns in bivariate data.	Finds clustering in scatter plots with support.	Investigates scatter plots for clustering and constructs a scatter plot from given data; constructs two-way frequency tables.	Investigates scatter plots for positive, negative, and linear associations and informally fits a line to the plot; calculates frequencies from data in two-way tables.	Investigates scatter plots for outliers and nonlinear association.; writes an equation for a trend line with a linear association; interprets two-way tables and interprets relative frequencies to describe associations in data.	Uses details from scatter plots and two-way frequency tables to make predictions in real-world situations.