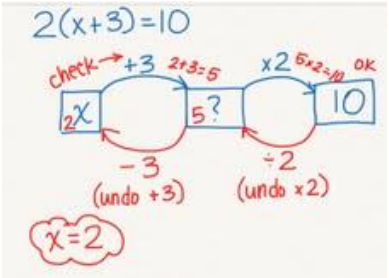
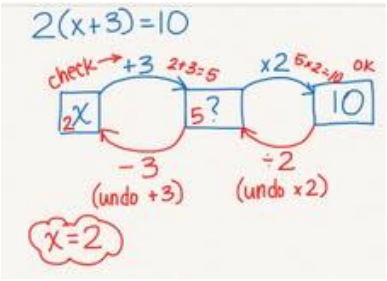
NUMBER AND QUANTITY			
Rational and Irrational Numbers			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • use rational approximations to compare the size of irrational numbers and estimate the value of expressions (8.NS.2)		**Sample Activities:** The student will place rational and irrational numbers on a number line and justify the location. The student will change repeating decimals into fractions. Example: $2.\overline{64}$ $100x = 264.\overline{64}$ $-\quad x = 2.\overline{64}$ $99x = 264$ $x = \frac{264}{99}$ $x = \frac{8}{3}$
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	

Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • approximation, compare, convert, decimal, estimate, expansion, expression, irrational number, non-repeating, non-terminating, number line, rational, rational number, size, value **The student will perform basic processes, such as:** • convert a decimal expansion which repeats into a rational number (8.NS.1) • locate irrational numbers (using rational approximations) on a number line (8.NS.2) • recognize or recall examples of irrational numbers such as π, √2, and non-repeating, non-terminating decimals		**Sample Activities:** The students will build a map or Venn diagram that shows the relationship between and among number sets. Through an explanation, the students will discover relationships or patterns in fractions that terminate or repeat. The denominator of terminating decimals must have factors of 2 and/or 5.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

NUMBER AND QUANTITY			
Exponents			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • evaluate square roots of small perfect squares and cube roots of small perfect cubes (8.EE.2) • use reasoning to compare very large or small quantities using numbers expressed in the form of a single digit times an integer power of 10 (8.EE.3) • perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used (8.EE.4)		**Sample Activities:** The students will participate in a class discussion on order of magnitude and growth. Using models in other bases, such as base two or five, the students will get a visual image of the speed of growth.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • compare, cube root, decimal, digit, equation, equivalent, evaluate, exponent, expression, integer, large, number, numerical, operation, perfect cube, perfect square, power of 10, quantity, reasoning, scientific notation, small, solution, square root, symbol, times **The student will perform basic processes, such as:** • apply the properties of integer exponents to generate equivalent numerical expressions (8.EE.1) • use square and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ (8.EE.2) • use scientific notation for measurements of very large and very small quantities (8.EE.4)		**Sample Activities:** The students will look at the national debt to see examples of large numbers. The students will also use census data to look at population growth.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

OPERATIONS AND ALGEBRA			
Equations and Inequalities			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • Recognize and solve linear equations with rational number coefficients where there is one solution, infinitely many solutions, or no solution (8.EE.7)		**Sample Activities:** The students will each be given an equation (there could be one solution, infinitely many solutions, or no solution) and create a diagram like the one shown below. Their diagram should depict how to come to the solution. Students will present their diagrams to the rest of the class. 
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	

Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • coefficient, distributive property, equation, example, infinite, integer, like, linear, rational number, solution, term **The student will perform basic processes, such as:** • solve linear equations with integer coefficients where there is one solution • recognize examples of linear equations with rational number coefficients where there is one solution (8.EE.7a) • use the distributive property and collect like terms when solving linear equations (8.EE.7b)		**Sample Activities:** The students will each be given an equation that has one solution and create a diagram like the one shown below. Their diagram should depict how to come to the solution. Students will present their diagrams to the rest of the class. 
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

OPERATIONS AND ALGEBRA			
Slope			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • derive the equation $y = mx + b$ for a line given two distinct non-vertical points (8.EE.5) • explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane using similar triangles (8.EE.6) • derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intersecting the vertical axis at b (8.EE.6)		**Sample Activities:** The students will use an equation to create a table and graph. The students will be given a notecard, containing a table, graph, or equation. The students will have to find the other two students whose information on the notecard matches up with theirs. Each group will contain an equation, a table, and a graph, all with corresponding data. The students will complete an activity called "Brown Blobs," can be found on the web site *10minutemath.com*. In this game, students will create a line that will go through as many "blobs" as possible. A similar program called "Save the Zogs" can be found at *mathplayground.com*.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • axis, coordinate plane, equation, graph, intersect, line, origin, point, proportional relationship, similar, slope, table, triangle, unit rate, vertical **The student will perform basic processes, such as:** • graph proportional relationships (8.EE.5) • interpret slope as the unit rate of the graph (8.EE.5) • compare proportional relationships displayed in different ways (e.g., graph, table, equation) (8.EE.5)		**Sample Activities:** The students will use an equation to create a table and graph. The students will be given a notecard, containing a table, graph, or equation. The students will have to find the other two students whose information on the notecard matches up with theirs. Each group will contain an equation, a table, and a graph, all with corresponding data. Once in their groups, students will work together to interpret the slope of the graph, and compare the relationships between the three notecards.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	

Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

OPERATIONS AND ALGEBRA			
Systems of Equations			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • solve systems of linear equations with rational solutions (8.EE.8b) • solve real-world and mathematical problems leading to two linear equations in two variables (8.EE.8c)		**Sample Activities:** The student will create linear equations and then graphs to solve real-world and mathematical problems. Sample problems: An eight-foot tree is growing at a rate of one foot per year. A five- foot tree is growing at a rate of two feet per year. How many years before they are the same height? The five-foot tree is gaining one foot per year. The eight-foot tree has a three-foot head start so after three years the trees will be equal in height. Two students are running down the track. One student starts at the goal line and the other starts at the 20-yard line. If both students are traveling at the same rate, when will the first student catch up to the second?
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	

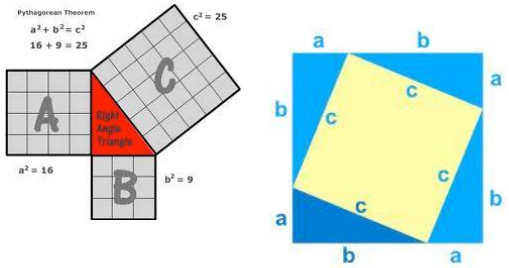
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • algebraic, equation, estimate, graph, infinite, integer, linear, mathematical, rational, real-world, solution, system, variable (8.EE.8a) **The student will perform basic processes, such as:** • solve systems of two linear equations with integer solutions in two variables algebraically (8.EE.8b) • estimate the solutions of systems of linear equations by graphing (8.EE.8b) • recognize that systems of linear equations may have one, infinitely many, or no solutions		**Sample Activities:** The student will be given two linear equations in which they will graph in order to determine whether the equations have one, infinitely many, or no solutions.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

FUNCTIONS			
Functions			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • compare properties of two functions represented in different ways (algebraically, numerically in tables, graphically, or by verbal description) (8.F.2)		**Sample Activities:** The students will be given a function written algebraically, and will have to create the same function in a different way (numerically in tables, graphically, or by verbal description).
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • algebraic, compare, equation, example, function, graphic, interpret, linear, numeric, property, represent, table, verbal (8.F.1) **The student will perform basic processes, such as:** • interpret the equation $y = mx + b$ as defining a linear function (8.F.3) • give examples of functions that are not linear (8.F.3)		**Sample Activities:** Given a variety of different functions, each written separately on a notecard, the students will determine if each notecard is linear or non-linear.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

FUNCTIONS			
Interpret Functions			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • determine the rate of change and initial value of a function from a description of a relationship or from two (*x*, *y*) values (8.F.4) • describe qualitatively the functional relationship between two quantities (e.g., reading a graph) (8.F.5)		**Sample Activities:** The students will be shown a teacher-selected graph and will describe the functional relationship between two quantities. For example, given a graph the student may describe the graph of the function between x=2 and x=5.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • analyze, function, functional relationship, graph, initial, model, qualitative, quantity, rate of change, relationship, sketch, value **The student will perform basic processes, such as:** • given the rate of change and initial value, determine the function that models the situation (8.F.4) • sketch a graph that exhibits the qualitative features of a function (8.F.5) • analyze the functional relationships between two graphs (8.F.5)		**Sample Activities:** The students will be given a verbal description of a situation and will sketch a graph that depicts the features of the description.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

GEOMETRY			
Volume			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • use the volumes of cones, spheres, and cylinders to solve real-world and mathematical problems (8.G.9)		**Sample Activities:** The students will use unit cubes to fill rectangular prisms. They will demonstrate that the area of the base is one layer of cubes and the height is the number of layers. This activity can be related to the idea to other prisms and cylinders. The students will understand the formulas rather than memorize them by using water or rice to show that the volume of a cylinder is ⅓ of a cylinder with the same base radius and height.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • cone, cylinder, formula, mathematical, real-world, sphere, volume **The student will perform basic processes, such as:** • recognize or recall the formulas for the volumes of cones, spheres, and cylinders (8.G.9)		**Sample Activities:** The students will match the correct formula with the solid.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

GEOMETRY			
Angles			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**student will:** • use informal arguments to establish facts about the angle sum and exterior angles of triangles, about the angles created when parallel lines are cut by a transversal, and about the angle-angle criterion for similarity of triangles (8.G.5)		**Sample Activities:** The students will arrange three identical triangles so the sum of the angles appears to forma line. The student will proceed to find the measurement of each angle.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • angle, angle sum, angle-angle criterion, argument, cut, exterior angle, fact, line, parallel, similarity, transversal, triangle **The student will perform basic processes, such as:** • recognize or recall facts about angle sum and exterior angles of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles		**Sample Activities:** The students will find the missing measurements of interior and exterior angles of triangles by recalling what they know about sum and exterior angles of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

GEOMETRY			
Pythagorean Theorem			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • explain the converse of a proof of the Pythagorean theorem (8.G.6) • use the Pythagorean theorem to determine unknown side lengths and solve problems in three dimensions (8.G.7)		**Sample Activities:** The students can prove the Pythagorean by rearrangement. They will look at the proof two different ways, demonstrated below: 
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • converse, coordinate system, dimension, distance, length, point, proof, Pythagorean theorem, side, unknown **The student will perform basic processes, such as:** • explain a proof of the Pythagorean theorem (8.G.6) • use the Pythagorean theorem to determine unknown side lengths and solve problems in two dimensions (8.G.7) • use the Pythagorean theorem to find the distance between two points in a coordinate system (8.G.8)		The students will watch demonstrations of a proof of Pythagorean theorem on YouTube. One excellent demo is “water proof”.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	

Score 0.0	**Even with help, no success**	

GEOMETRY			
Congruence and Similarity			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • describe a sequence of transformations that exhibits the similarity between two similar two-dimensional figures (8.G.4)		**Sample Activities:** The students will use an open source program, called Geogebra, which can be found at geogebra.com. This program includes free classroom materials and teacher created activities. It is similar to Sketchpad, but features the ability for students to create interactive graphics, algebra, and spreadsheet.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • congruence, congruent, exhibit, figure, sequence, similar, similarity, transformation, two-dimensional **The student will perform basic processes, such as:** • describe the sequence of transformations that exhibits the congruence between two congruent figures (8.G.2)		**Sample Activities:** The students will create two congruent figures by using a sequence of transformations on a coordinate plane. The students will show their two figures to a partner, in which the partner will describe the sequence of transformations that exhibits the congruence.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	

Score 0.0	**Even with help, no success**	

GEOMETRY			
Transformations			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates (8.G.3)		**Sample Activities:** The students will be given one two-dimensional figure on a coordinate plane and will create the shape as a translation, rotation, reflection, and dilation, and explain the steps for how they created each.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • coordinate, dilation, experimental, figure, property, reflection, rotation, translation, two-dimensional **The student will perform basic processes, such as:** • verify experimentally the properties of rotations, reflections, and translations (8.G.1)		**Sample Activities:** Using tangrams, the students will place a shape on a coordinate plane and then appropriately place a second shape to create a translation, reflection, or rotation.
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

MEASUREMENT, DATA, STATISTICS, AND PROBABILITY			
Multi-Variable Data Distributions			
Grade 8			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept (8.SP.3) • interpret patterns of association by displaying frequencies and relative frequencies in a two-way table; describe associations between variables (8.SP.4)		**Sample Activities:** Given a set of data, the students will create a scatter plot in which they will then determine the slope and intercept.
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • assess, association, bivariate, construct, data, equation, frequency, informal, intercept, interpret, line, linear, model, pattern, quantitative, relationship, relative, scatter plot, slope, two-way table, variable **The student will perform basic processes, such as:** • construct and interpret scatter plots for bivariate measurement data (8.SP.1) • use straight lines to informally model and assess relationships between two quantitative variables (8.SP.2)		**Sample Activities:** The students will be introduced to many ways of modeling bivariate measurements of data; such as phone plans, service plans for repair work, plotting time versus distance for an object. Students will start at the goal line of a football field. Walk slowly for 20 yards, walk fast for 20 yards, run for 20 yards and walk backwards for 20 yards. Plot the distance from goal line versus time to see how the slope of the line shows velocity. The students will look at graphs of a person or object in motion and explain what the person is doing to create that graph. (If available use a motion detector to match student's movement with a graph.)
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	

Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		