	Grade Difference
CC.8.NS.1. Know that there are numbers that are not rational, and approximate them by rational numbers. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	
GA.8.N.1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	0
GA.8.N.1.h Distinguish between rational and irrational numbers.	0
CC.8.NS.2 Know that there are numbers that are not rational, and approximate them by rational numbers. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of √2 (square root of 2), show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	
GA.8.N.1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	0
GA.8.N.1.b Recognize the (positive) square root of a number as a length of a side of a square with a given area.	0
GA.8.N.1.c Recognize square roots as points and as lengths on a number line.	0
GA.8.N.1.e Recognize and use the radical symbol to denote the positive square root of a positive number.	0
GA.8.N.1.f Estimate square roots of positive numbers.	0
GA.8.N.1.g Simplify, add, subtract, multiply, and divide expressions containing square roots.	0
GA.8.N.1.k Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.	0
CC.8.EE.1 Work with radicals and integer exponents. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 3^2 × 3^(–5) = 3^(–3) = 1/(3^3) = 1/27.	
GA.8.N.1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	0
GA.8.N.1.i Simplify expressions containing integer exponents.	0
CC.8.EE.2 Work with radicals and integer exponents. Use square root and cube root symbols to represent solutions to equations of the form x^2 = p and x^3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	
GA.8.N.1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	0
GA.8.N.1.a Find square roots of perfect squares.	0
GA.8.N.1.d Understand that the square root of 0 is 0 and that every positive number has two square roots that are opposite in sign.	0
GA.8.N.1.e Recognize and use the radical symbol to denote the positive square root of a positive number.	0
GA.8.N.1.h Distinguish between rational and irrational numbers.	0
GA.9-12.M1.A.1 (MM1A1.) Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.	-1 to -4
GA.9-12.M1.A.1.b (MM1A1.b.) Graph the basic functions f(x) = x^n,where n = 1 to 3, f(x) = √x, f(x) =|x|, and f(x) = 1/x.	-1 to -4
GA.9-12.M1.A.1.d (MM1A1.d.) Investigate and explain the characteristics of a function: domain, range, zeros, intercepts, intervals of increase and decrease, maximum and minimum values, and end behavior.	-1 to -4

CC.8.EE.3 Work with radicals and integer exponents. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 × 10^8 and the population of the world as 7 × 10^9, and determine that the world population is more than 20 times larger.

GA.8.N.1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	0
GA.8.N.1.j Express and use numbers in scientific notation.	0
GA.8.N.1.k Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.	0

CC.8.EE.4 Work with radicals and integer exponents. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

GA.8.N.1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	0
GA.8.N.1.j Express and use numbers in scientific notation.	0
GA.8.N.1.k Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.	0

CC.8.EE.5 Understand the connections between proportional relationships, lines, and linear equations. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

GA.8.A.4 Students will graph and analyze graphs of linear equations and inequalitites.	0
GA.8.A.4.a Interpret slope as a rate of change.	0
GA.8.A.4.c Graph equations of the form y = mx + b.	0
GA.8.A.4.d Graph equations of the form ax + by = c.	0
GA.8.A.4.f Determine the equation of a line given a graph, numerical information that defines the line or a context involving a linear relationship.	0
GA.8.A.4.g Solve problems involving linear relationships.	0

CC.8.EE.6 Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y =mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

GA.7.G.3 Students will use the properties of similarity and apply these concepts to geometric figures.	1
GA.7.G.3.a Understand the meaning of similarity, visually compare geometric figures for similarity, and describe similarities by listing corresponding parts.	1
GA.7.G.3.b Understand the relationships among scale factors, length ratios, and area ratios between similar figures. Use scale factors, length ratios, and area ratios to determine side lengths and areas of similar geometric figures.	1
GA.7.G.3.c Understand congruence of geometric figures as a special case of similarity: The figures have the same size and shape.	1
GA.8.A.4 Students will graph and analyze graphs of linear equations and inequalitites.	0
GA.8.A.4.a Interpret slope as a rate of change.	0
GA.8.A.4.b Determine the meaning of the slope and y-intercept in a given situation.	0

CC.8.EE.7 Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable.

GA.8.A.1 Students will use algebra to represent, analyze, and solve problems.	0
GA.8.A.1.c Solve algebraic equations in one variable, including equations involving absolute values.	0

CC.8.EE.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

GA.8.A.1 Students will use algebra to represent, analyze, and solve problems.	0
GA.8.A.1.b Simplify and evaluate algebraic expressions.	0
GA.8.A.1.c Solve algebraic equations in one variable, including equations involving absolute values.	0

CC.8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

GA.8.A.1 Students will use algebra to represent, analyze, and solve problems.	0
GA.8.A.1.b Simplify and evaluate algebraic expressions.	0
GA.8.A.1.c Solve algebraic equations in one variable, including equations involving absolute values.	0
GA.8.A.1.e Interpret solutions in problem contexts.	0

CC.8.EE.8 Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations.

GA.8.A.5 Students will understand systems of linear equations and inequalities and use them to solve problems.	0
GA.8.A.5.b Solve systems of equations graphically and algebraically, using technology as appropriate.	0

CC.8.EE.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

GA.8.A.5 Students will understand systems of linear equations and inequalities and use them to solve problems.	0
GA.8.A.5.b Solve systems of equations graphically and algebraically, using technology as appropriate.	0

CC.8.EE.8b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.

GA.8.A.5 Students will understand systems of linear equations and inequalities and use them to solve problems.	0
GA.8.A.5.b Solve systems of equations graphically and algebraically, using technology as appropriate.	0

CC.8.EE.8c Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

GA.8.A.5 Students will understand systems of linear equations and inequalities and use them to	0

solve problems.

GA.8.A.5.a Given a problem context, write an appropriate system of linear equations or inequalities.	0
GA.8.A.5.b Solve systems of equations graphically and algebraically, using technology as appropriate.	0
GA.8.A.5.d Interpret solutions in problem contexts.	0

CC.8.F.1 Define, evaluate, and compare functions. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8.)

GA.8.A.3 Students will understand relations and linear functions.	0
GA.8.A.3.a Recognize a relation as a correspondence between varying quantities.	0
GA.8.A.3.b Recognize a function as a correspondence between inputs and outputs where the output for each input must be unique.	0
GA.8.A.3.c Distinguish between relations that are functions and those that are not functions.	0
GA.8.A.3.d Recognize functions in a variety of representations and a variety of contexts.	0
GA.8.A.3.i Translate among verbal, tabular, graphic, and algebraic representations of functions.	0

CC.8.F.2 Define, evaluate, and compare functions. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

GA.8.A.3.d Recognize functions in a variety of representations and a variety of contexts.	0
GA.8.A.3.e Use tables to describe sequences recursively and with a formula in closed form.	0
GA.8.A.3.i Translate among verbal, tabular, graphic, and algebraic representations of functions.	0

CC.8.F.3 Define, evaluate, and compare functions. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

GA.8.A.3 Students will understand relations and linear functions.	0
GA.8.A.3.d Recognize functions in a variety of representations and a variety of contexts.	0
GA.8.A.3.f Understand and recognize arithmetic sequences as linear functions with whole number input values.	0
GA.8.A.3.g Interpret the constant difference in an arithmetic sequence as the slope of the associated linear function.	0
GA.8.A.3.h Identify relations and functions as linear or nonlinear.	0

CC.8.F.4 Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

GA.8.A.4 Students will graph and analyze graphs of linear equations and inequalitites.	0
GA.8.A.4.a Interpret slope as a rate of change.	0
GA.8.A.4.b Determine the meaning of the slope and y-intercept in a given situation.	0
GA.8.A.4.f Determine the equation of a line given a graph, numerical information that defines the line or a context involving a linear relationship.	0

CC.8.F.5 Use functions to model relationships between quantities. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	
GA.8.A.3 Students will understand relations and linear functions.	0
GA.8.A.3.i Translate among verbal, tabular, graphic, and algebraic representations of functions.	0
GA.9-12.M1.A.1 (MM1A1.) Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.	-1 to -4
GA.9-12.M1.A.1.d (MM1A1.d.) Investigate and explain the characteristics of a function: domain, range, zeros, intercepts, intervals of increase and decrease, maximum and minimum values, and end behavior.	-1 to -4
CC.8.G.1 Understand congruence and similarity using physical models, transparencies, or geometry software. Verify experimentally the properties of rotations, reflections, and translations: **-- a. Lines are taken to lines, and line segments to line segments of the same length.** **-- b. Angles are taken to angles of the same measure.** **-- c. Parallel lines are taken to parallel lines.**	
GA.7.G.2 Students will demonstrate understanding of transformations.	1
GA.7.G.2.a Demonstrate understanding of translations, dilations, rotations, reflections, and relate symmetry to appropriate transformations.	1
GA.7.G.2.b Given a figure in the coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection.	1
CC.8.G.2 Understand congruence and similarity using physical models, transparencies, or geometry software. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	
GA.7.G.2 Students will demonstrate understanding of transformations.	1
GA.7.G.2.b Given a figure in the coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection.	1
GA.7.G.3 Students will use the properties of similarity and apply these concepts to geometric figures.	1
GA.7.G.3.a Understand the meaning of similarity, visually compare geometric figures for similarity, and describe similarities by listing corresponding parts.	1
GA.7.G.3.c Understand congruence of geometric figures as a special case of similarity: The figures have the same size and shape.	1
GA.8.G.1 Students will understand and apply the properties of parallel and perpendicular lines and understand the meaning of congruence.	0
GA.8.G.1.d Understand the meaning of congruence: that all corresponding angles are congruent and all corresponding sides are congruent.	0
GA.5.G.1 Students will understand congruence of geometric figures and the correspondence of their vertices, sides, and angles.	3
CC.8.G.3 Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.	
GA.7.G.2 Students will demonstrate understanding of transformations.	1
GA.7.G.2.b Given a figure in the coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection.	1

CC.8.G.4 Understand congruence and similarity using physical models, transparencies, or geometry software. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	
GA.7.G.2 Students will demonstrate understanding of transformations.	1
GA.7.G.2.b Given a figure in the coordinate plane, determine the coordinates resulting from a translation, dilation, rotation, or reflection.	1
GA.7.G.3 Students will use the properties of similarity and apply these concepts to geometric figures.	1
GA.7.G.3.a Understand the meaning of similarity, visually compare geometric figures for similarity, and describe similarities by listing corresponding parts.	1
GA.7.G.3.b Understand the relationships among scale factors, length ratios, and area ratios between similar figures. Use scale factors, length ratios, and area ratios to determine side lengths and areas of similar geometric figures.	1
CC.8.G.5 Understand congruence and similarity using physical models, transparencies, or geometry software. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the three angles appear to form a line, and give an argument in terms of transversals why this is so.	
GA.4.M.2 Students will understand the concept of angles and how to measure them.	4
GA.4.M.2.c Determine that the sum of the three angles of a triangle is always 180°.	4
GA.8.G.1 Students will understand and apply the properties of parallel and perpendicular lines and understand the meaning of congruence.	0
GA.8.G.1.b Apply properties of angle pairs formed by parallel lines cut by a transversal.	0
GA.9-12.M1.G.3 (MM1G3.) Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.	-1 to -4
GA.9-12.M1.G.3.a (MM1G3.a.) Determine the sum of interior and exterior angles in a polygon.	-1 to -4
CC.8.G.6 Understand and apply the Pythagorean Theorem. Explain a proof of the Pythagorean Theorem and its converse.	
GA.8.G.2 Students will understand and use the Pythagorean theorem.	0
GA.8.G.2.b Recognize and interpret the Pythagorean theorem as a statement about areas of squares on the sides of a right triangle.	0
CC.8.G.7 Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	
GA.8.G.2 Students will understand and use the Pythagorean theorem.	0
GA.8.G.2.a Apply properties of right triangles, including the Pythagorean theorem.	0
GA.8.G.2.b Recognize and interpret the Pythagorean theorem as a statement about areas of squares on the sides of a right triangle.	0
CC.8.G.8 Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	
GA.9-12.M1.G.1 (MM1G1.) Students will investigate properties of geometric figures in the coordinate plane.	-1 to -4
GA.9-12.M1.G.1.a (MM1G1.a.) Determine the distance between two points.	-1 to -4

CC.8.G.9 Solve real-world and mathematical problems involving volume of cylinders, cones and spheres. Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	
GA.6.M.3 Students will determine the volume of fundamental solid figures (right rectangular prisms, cylinders, pyramids and cones).	2
GA.6.M.3.a Determine the formula for finding the volume of fundamental solid figures.	2
GA.6.M.3.b Compute the volumes of fundamental solid figures, using appropriate units of measure.	2
GA.6.M.3.d Solve application problems involving the volume of fundamental solid figures.	2
GA.9-12.M2.G.4 (MM2G4.) Students will find and compare the measures of spheres.	-1 to -4
GA.9-12.M2.G.4.a (MM2G4.a.) Use and apply surface area and volume of a sphere.	-1 to -4
GA.9-12.M2.G.4.b (MM2G4.b.) Determine the effect on surface area and volume of changing the radius or diameter of a sphere.	-1 to -4
CC.8.SP.1 Investigate patterns of association in bivariate data. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	
GA.8.D.4 Students will organize, interpret, and make inferences from statistical data	0
GA.8.D.4.a Gather data that can be modeled with a linear function.	0
GA.8.D.4.b Estimate and determine a line of best fit from a scatter plot.	0
CC.8.SP.2 Investigate patterns of association in bivariate data. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	
GA.8.D.4 Students will organize, interpret, and make inferences from statistical data	0
GA.8.D.4.a Gather data that can be modeled with a linear function.	0
GA.8.D.4.b Estimate and determine a line of best fit from a scatter plot.	0
CC.8.SP.3 Investigate patterns of association in bivariate data. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	
GA.8.D.4 Students will organize, interpret, and make inferences from statistical data	0
GA.8.D.4.a Gather data that can be modeled with a linear function.	0
GA.8.D.4.b Estimate and determine a line of best fit from a scatter plot.	0
CC.8.SP.4 Investigate patterns of association in bivariate data. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	
GA.7.D.1 Students will pose questions, collect data, represent and analyze the data, and interpret results.	1
GA.7.D.1.b Construct frequency distributions.	1