Standard	Minimally Proficient	Partially Proficient	Proficient	Highly Proficient
	The Minimally Proficient student	The Partially Proficient student	The Proficient student	The Highly Proficient student
The Number System				
8.NS.A.1	Identify irrational numbers.	Know that numbers that are not rational are called irrational. Identify a decimal expansion of irrational number.	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion. Know that numbers whose decimal expansions do not terminate in zeros or in a repeating sequence of fixed digits are called irrational.	Explain that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion. Explain that numbers whose decimal expansions do not terminate in zeros or in a repeating sequence of fixed digits are called irrational.
8.NS.A.2	Approximate irrational numbers on a number line diagram.	Use rational approximations of irrational numbers to compare the size of irrational numbers. Locate them approximately on a number line diagram.	Use rational approximations of irrational numbers to compare the size of irrational numbers. Locate them approximately on a number line diagram, and estimate their values.	Use rational approximations of irrational numbers to compare the size of irrational numbers. Locate them approximately on a number line diagram, and calculate their values.
8.NS.A.3	Understand that given any two distinct rational numbers, a < b, identify a rational number c and an irrational number d such that a < c < b and a < d < b.	Understand that given any two distinct rational numbers, a < b, identify a rational number c and an irrational number d such that a < c < b and a < d < b. Given any two distinct irrational numbers, a < b, identify a rational number c and an irrational number d such that a < c < b and a < d < b.	Understand that given any two distinct rational numbers, a < b, there exist a rational number c and an irrational number d such that a < c < b and a < d < b. Given any two distinct irrational numbers, a < b, there exists a rational number c and an irrational number d, such that a < c < b and a < d < b.	Explain that given any two distinct rational numbers, a < b, there exist a rational number c and an irrational number d such that a < c < b and a < d < b. Given any two distinct irrational numbers, a < b, there exist a rational number c and an irrational number d such that a < c < b and a < d < b.

Expressions and Equations				
8.EE.A.1	Apply the properties of integer exponents to identify equivalent numerical expressions.	Apply the properties of integer exponents to generate equivalent numerical expressions.	Understand and apply the properties of integer exponents to generate equivalent numerical expressions.	Understand and apply the properties of integer exponents to generate and interpret equivalent numerical expressions.
8.EE.A.2	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3= p, where p is a positive rational number. Know that √2 is irrational. a. Identify square roots of perfect squares less than or equal to 100. b. Identify cube roots of perfect cubes less than or equal to 500.	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3= p, where p is a positive rational number. Know that √2 is irrational. a. Identify square roots of perfect squares less than or equal to 225. b.Identify cube roots of perfect cubes less than or equal to 1000.	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3= p, where p is a positive rational number. Know that √2 is irrational. a. Evaluate square roots of perfect squares less than or equal to 225. b. Evaluate cube roots of perfect cubes less than or equal to 1000.	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3= p, where p is a positive rational number. Know that √2 is irrational. a. Evaluate square roots less than or equal to 225. b. Evaluate cube roots less than or equal to 1000.
8.EE.A.3	Identify numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities.	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities.	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 express how many times larger or smaller one is than the other.	Use numbers expressed in the form of a single digit times an integer power of 10 to interpret very large or very small quantities, and express how many times larger or smaller one is than the other.
8.EE.A.4	Perform operations with numbers expressed in scientific notation.	Perform operations with numbers expressed in scientific notation including problems where both decimal and scientific notation are used. Use scientific notation for measurements of very large or very small quantities.	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.	Perform operations with numbers expressed in scientific notation including problems where both decimal and scientific notation are used. Use scientific notation to interpret for measurements of very large or very small quantities.
8.EE.B.5	Graph proportional relationships.	Graph proportional relationships interpreting the unit rate as the slope of the graph. Compare two different proportional relationships.	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.	Graph proportional relationships interpreting the unit rate as the slope of the graph. Compare and explain two different proportional relationships represented in different ways.

8.EE.B.6	Use similar triangles to identify that the slope is the same between any two distinct points on a non-vertical line in the coordinate plane.	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. Use the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at (0, b).	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 (0, b).	Use similar triangles to prove 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 (0, b).
8.EE.C.7	Fluently solve linear equations and inequalities in one variable. a. Identify linear equations in one variable with one solution, infinitely many solutions, or no solution. b. Identify the solution to linear equations and inequalities with rational number coefficients.	Fluently solve linear equations and inequalities in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. b. Solve linear equations and inequalities with rational number coefficients.	Fluently solve linear equations and inequalities in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. 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). b. Solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the distributive property and collecting like terms.	Fluently solve linear equations and inequalities in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. Explain 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). b. Explain how to solve linear equations and inequalities with rational number coefficients, including solutions that require expanding expressions using the distributive property and collecting like terms.
8.EE.C.8	Analyze and solve pairs of simultaneous linear equations. a. Identify the point of intersection for graphs of two linear equations in two variables. b. Identify solutions to simple systems of equations by inspection. c. Solve mathematical problems using two linear equations in two variables.	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs. b. Estimate solutions to sytems of two lyniear equations in two variables by graphing the equations,including cases of no solution and infinite number of solutions. Solve simple cases by inspection. c. Solve mathematical problems and problems in real-world context using two linear equations in two variables.	Analyze and solve pairs of simultaneous linear equations. a. 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. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations, including cases of no solution and infinite number of solutions. Solve simple cases by inspection. c. Solve mathematical problems and problems in real-world contexts leading to two linear equations in two variables.	Analyze and solve pairs of simultaneous linear equations. a. Explain 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. b. Solve systems of two linear equations in two variables algebraically, and solve solutions by graphing the equations including cases of no solution and infinite number of solutions. Solve simple cases by inspection. c. Solve mathematical problems and problems in real-world context by creating two linear equations in two variables.

Functions				
8.F.A.1	Identify a function rule that assigns to each input exactly one output. (Function notation is not required in Grade 8.)	Generate a function rule that assigns to each input exactly one output. Identify the graph of a function as the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8.)	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.)	Explain that a function is a rule that assigns to each input exactly one output. Explain that 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.)
8.F.A.2	Identify properties of two functions each represented in the same way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Compare properties of two functions each represented in the same way (algebraically, graphically, numerically in tables, or by verbal descriptions).	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.	Interpret properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
8.F.A.3	Identify a linear function whose graph is a straight line.	Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line.	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.	Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line; give real-world examples of functions that are not linear.
8.F.B.4	Given a description of a situation, identify a function to model a linear relationship between two quantities.	Given a description of a situation, generate a function to model a linear relationship between two quantities. Identify 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 a graph.	Given a description of a situation, generate 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 a graph. Track how the values of the two quantities change together. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.	Given a description of a situation, generate 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 a graph. Interpret how the values of the two quantities change together. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.
8.F.B.5	Identify a graph that exhibits the qualitative features of a function that has been described verbally.	Identify 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.	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.	Interpret 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.

Geometry				
8.G.A.1	Identify the properties of rotations, reflections, and translations. Properties include: lines are taken to lines, line segments are taken to line segments of the same length, angles are taken to angles of the same measure, parallel lines are taken to parallel lines.	identify experimentally the properties of rotations, reflections, and translations. Properties include: lines are taken to lines, line segments are taken to line segments of the same length, angles are taken to angles of the same measure, parallel lines are taken to parallel lines.	Verify experimentally the properties of rotations, reflections, and translations. Properties include: lines are taken to lines, line segments are taken to line segments of the same length, angles are taken to angles of the same measure, parallel lines are taken to parallel lines.	Prove the properties of rotations, reflections, and translations. Properties include: lines are taken to lines, line segments are taken to line segments of the same length, angles are taken to angles of the same measure, parallel lines are taken to parallel lines.
8.G.A.2	Given two congruent figures, identify a sequence that demonstrates congruence.	Understand that a two-dimensional figure is congruent to another if one can be obtained from the other by a sequence of rotations, reflections, and translations; given two congruent figures, identify a sequence that demonstrates congruence.	Understand that a two-dimensional figure is congruent to another if one can be obtained from the other by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that demonstrates congruence.	Prove that a two-dimensional figure is congruent to another if one can be obtained from the other by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that demonstrates congruence.
8.G.A.3	Identify the effect of dilations, translations, rotations, and reflections on two-dimensional figures.	Identify the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	Describe and interpret the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.A.4	Given two similar two-dimensional figures, identify a sequence that demonstrates similarity.	Understand that a two-dimensional figure is similar to another if, and only if, one can be obtained from the other by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, identify a sequence that demonstrates similarity.	Understand that a two-dimensional figure is similar to another if, and only if, one can be obtained from the other by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that demonstrates similarity.	Explain that a two-dimensional figure is similar to another if, and only if, one can be obtained from the other by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that demonstrates similarity.
8.G.A.5	Use 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.	Identify 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.	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 sum of the three angles appears to form a line, and give an argument in terms of transversals explaining why this is so.	Prove 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.
8.G.B.6	Identify examples of the application of the converse of the Pythagorean Theorem.	Apply the converse of the Pythagorean Theorem.	Understand the Pythagorean Theorem and its converse.	Prove the converse of the Pythagorean Theorem.
8.G.B.7	Apply the Pythagorean Theorem to determine the hypotenuse in right triangles in real-world context and mathematical problems in two dimensions.	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world context and mathematical problems in two dimensions.	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world contexts and mathematical problems in two and three dimensions.	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world context and mathematical problems in two and three dimensions and interpret the results.

8.G.B.8	Use the Pythagorean Theorem to find the distance between two points in the first quadrant of a coordinate system.	Use the Pythagorean Theorem to find the distance between two points in a coordinate system.	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Apply the Pythagorean Theorem to find the scaled distance between two points in a coordinate system.
8.G.C.9	Apply formulas for volumes of cones, cylinders, and spheres.	Understand and use formulas for volumes of cones, cylinders, and spheres.	Understand and use formulas for volumes of cones, cylinders, and spheres and use them to solve real-world context and mathematical problems.	Know and use formulas for volumes of cones, cylinders and spheres and use them to solve real-world context and mathematical problems.

Statistics and Probability				
8.SP.A.1	Construct scatter plots for bivariate measurement data.	Construct scatter plots for bivariate measurement data to investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Construct and interpret scatter plots for bivariate measurement data to investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Construct and interpret scatter plots for bivariate measurement data to investigate and interpret patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.A.2	For scatter plots that suggest a linear association, informally fit a straight line.	Identify straight lines 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.	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.	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.SP.A.3	Identify properties of the equation of a linear model to solve problems in the context of bivariate measurement data.	Use the equation of a linear model to solve problems in the context of bivariate measurement data, identifying the slope and intercept.	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.	Create an equation for a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
8.SP.A.4	Construct a two-way table summarizing data on two categorical variables collected from the same subjects.	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.	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.	Explain patterns of association 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.
8.SP.B.5	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Identify the probability of a compound event. b. Identify sample spaces for compound events using organized lists, tables, tree diagrams and other methods. c. Use a simulation to identify frequencies for compound events.	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Identify the probability of a compound event as the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using organized lists, tables, tree diagrams, and other methods. c. Use a simulation to generate frequencies for compound events.	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulations. a. Understand that the probability of a compound event is the fraction of outcomes in the sample space in which the compound event occurs. b. Represent sample spaces for compound events using organized lists, tables, tree diagrams, and other methods. Identify the outcomes in the sample that composes the event. c. Design and use a simulation to generate frequencies for compound events.	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Explain why the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using organized lists, tables, tree diagrams, and other methods. Identify and interpret the outcomes in the sample space that composes the event. c. Design and use a simulation to generate frequencies for compound events and interpret in context.