Common Core Math Standards
Grade 8

Common Core Standards	Converted/Unpacked Standards	
Standards Code: OA=Operations and Algebraic Thinking, NBT=Number and Operations in Base 10, MD=Measurements and Data, G=Geometry, NF=Number and Operations-Fractions, RP=Rations and Proportional Relationships, NS= Number System, EE=Expressions and Equations, SP=Statistics and Probability, A=Algebra.		
CC.8.NS.1.Understand informally that evey number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0's or eventually repeat. Know that other numbers are called irrational.	I can demonstrate that every number has a decimal expansion. (CCSS: 8.NS.1) I can convert a repeating decimal into a rational number. (CCSS: 8.NS.1) For rational numbers I can show that the decimal expansion repeats eventually. (CCSS: 8.NS.1) I can convert a decimal expansion which repeats eventually into a rational number. (CCSS: 8.NS.1)	
CC.8.NS.2 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., π2). For example,by truncating the decimal expansion 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.	I can use rational approximations of irrational numbers to compare the size of irrational numbers, locate and plot them approximately on a number line diagram, and estimate the value of expressions. (CCSS: 8.NS.2) I can use estimated values to compare two or more irrational numbers. (CCSS: 8.NS.2)	
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.	I can use the properties of integer exponents to simplify expressions. (CCSS: 8.EE.1)	
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.	I can 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. (CCSS: 8.EE.2) I can evaluate the square root of a perfect square (CCSS: 8.EE.2) I can evaluate the cube root of a perfect cube. (CCSS: 8.EE.2) I can justify that the square root of a non-prefect square will be irrational. (CCSS: 8.EE.2)	

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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.	I can write an estimation of a large quantity by expressing it as the product of a single-digit number and a positive power of ten. (CCSS: 8.EE.3) I can write an estimation of a very small quantity by expressing it as the product of a single-digit number and a negative power of ten. (CCSS: 8.EE.3) I can compare quantities written as the product of a single-digit number and a power of ten by stating their mutiplicative relationships. (CCSS: 8.EE.3)	
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.	I can perform operations (addition/subtraction/multiplication/division) with two numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. (CCSS: 8.EE.4) I can use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.(CCSS: 8.EE.4) I can interpret scientific notation that has been generated by technology. (CCSS: 8.EE.4)	
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.	I can graph proportional relationships, interpreting the unit rate as the slope of the graph. (CCSS: 8.EE.5) I can justify that the graph of a proportional relationship will always intersect the origin (0,0) of the graph. (CCSS: 8.EE.5) I can use a grpah, a table, or an equation to determine the unit rate of a proportional relationship an use the unit rate to make comparisons between various proportional relationships. (CCSS: 8.EE.5)	
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.	I can 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. (CCSS: 8.EE.6) I can justify that an equation in a form of *y=mx* will represent the graph of a proportional relationship with a slope of *m* and *y*-intercept of 0. (CCSS: 8.EE.6) I can justify that an equation in the form of *y=mx + b* represents the graph of a linear relationship with a slope of *m* and a *y-intercept* of *b*. (CCSS: 8.EE.6)	
CC.8.EE.7 Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable.	I can solve linear equations in one variable. (CCSS: 8.EE.7)	

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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).	I can simplify a linear equation by using the distributive property and/or combining like terms. (CCSS: 8.EE.7a) I can give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. (CCSS: 8.EE.7a)	
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.	I can solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. (CCSS: 8.EE.7b)	
CC.8.EE.8 Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations.	I can analyze and solve pairs of simultaneous linear equations. (CCSS: 8.EE.8)	
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.	I can 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. (CCSS: 8.EE.8a)	
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.	I can solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. I can solve simple cases by inspection. (CCSS: 8.EE.8b)	
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.	I can solve real-world and mathematical problems leading to two linear equations in two variables intersecting. (CCSS: 8.EE.8c)	
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.)	I can define a function as a rule that assigns to each input exactly one output. (CCSS: 8.F.1) I can show the relationship between the inputs and outputs of a function by graphing them as ordered pairs on a coordinate grid. (CCSS: 8.F.1)	
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.	I can determine the properties of a function written in algebraic form (rate of change, meaning of *y-intercept*, linear, non-linear). (CCSS: 8.F.2) I can determine the properties of a function given the inputs and outputs in a table. (CCSS: 8.F.2) I can compare the properties of two functions that are represented differently (equation, a table, graphically, or verbal representation). (CCSS: 8.F.2)	

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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.	I can explain why the equation *y=mx+b* represents a linear function and interpret the slope and *y-intercept* in relation to the function. (CCSS: 8.F.3) I can give examples of relationships that are non-linear functions. (CCSS: 8.F.3) I can create a table of values that can be defined as a non-linear function. (CCSS: 8.F.3)	
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.	I can construct a function to model a linear relationship between two quantities. (CCSS: 8.F.4) I can 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. (CCSS: 8.F.4) I can 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. (CCSS: 8.F.4)	
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.	I can match the graph of function to a given situation. (CCSS: 8.F.5) I can sketch a graph that exhibits the qualitative features of a function that has been described verbally. (CCSS: 8.F.5) I can write a story that describes the functional replationship between two variables depicted on a graph. (CCSS: 8.F.5)	
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.	I can verify by measuring and comparing lengths, angle measures, and parallelism, of a figure and its image that after a figure has been translated, or reflected, or rotated corresponding lines and line segments remain the same length, corresponding angles have the same measure, and corresponding parallel lines remain parellel.1 (CCSS: 8.G.1.1a.1b.1c.)	
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.	I can demonstrate 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. (CCSS: 8.G.2) Given two congruent figures, I can describe a sequence of transformations that exhibits the congruence between them. (CCSS: 8.G.2)	

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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.	I can describe the changes occurring to the *x*-and *y*-coordinates of a figure after a: translation, reflection, rotation, dialation. (CCSS: 8.G.3)	
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.	I can explain how transformation can be used to prove that two figures are similar. (CCSS: 8.G.4) I can describe a sequence of transformations to prove or disprove that two given figures are similar. (CCSS: 8.G.4)	
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.	I can informally prove that the sum of any triangle's interior angles will be the same measure as a stright angle (180 degrees). (CCSS: 8.G.5) I can informally prove that the sum of any polygon's exterior angles will be 360 degrees. (CCSS: 8.G.5) I can make conjectures regarding the relationships and measurements of the angles created when two parallel lines are cut be a transversal. (CCSS: 8.G.5)	
CC.8.G.6 Understand and apply the Pythagorean Theorem. Explain a proof of the Pythagorean Theorem and its converse.	I can use the Pythagorean theorem to determine if the given triangle is a right triangle . (CCSS: 8.G.6) I can use algebraic reasoning to relate the visual model to the Pythagorean Theorem. (CCSS: 8.G.6)	
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.	I can apply the Pythagorean Theorem to find an unknown side length of a right triangle. (CCSS: 8.G.7) I can draw a diagram and use the Pythagorean Theorem to solve real world problems involving right triangles. (CCSS: 8.G.7) I can draw a diagram to find right triangles in a three-dimensional figure and use the Pythagorean Theorem to calculate various dimensions. (CCSS: 8.G.7)	
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.	I can connect any two points on a coordinate grid to a third point so that the three points form a right triangle. (CCSS: 8.G.8) I can use the right triangle and the Pythagorean Theorem to find the distance between the original two points. (CCSS: 8.G.8)	

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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.	I can state the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. (CCSS: 8.G.9) I can describe the similarity between finding the volume of a cylinder and the volume of a right prism. (CCSS: 8.G.9) I can informally prove the relationship between the volume of a cylinder and the volume of a cone with the same base. (CCSS: 8.G.9) I can informally prove the relationship between the volume of a sphere and the volume of a circumscribed cylinder. (CCSS: 8.G.9) I can solve real world problems involving the volume of cylinders, cones, and spheres. (CCSS: 8.G.9)	
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.	I can plot ordered pairs on a coordinate grid representing the relationship between two data sets. (CCSS: 8.SP.1) I can describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. (CCSS: 8.SP.1)	
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.	I can recognize whether or not data plotted on a scatter plot have a linear association. (CCSS: 8.SP.2) I can draw a straight trend line to approximate the linear relationship between the plotted points of two data sets. (CCSS: 8.SP.2)	
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.	I can determine the equation of a trend line that approximates the linear relationship between the plotted points of two data sets. (CCSS: 8.SP.3) I can interpret the *y-intercept* of the equation in the context of the collected data. (CCSS: 8.SP.3) I can interpret the slope of the equation in the context of the collected data. (CCSS: 8.SP.3) I can use the equation of the trend line to summarize the given data and make predictions regarding additional data points. (CCSS: 8.SP.3)	

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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?	I can create a two-way table to record the frequencies of bivariate categorical values. (CCSS: 8.SP.4) I can determine the relative frequencies for rows and/or columns of a two-way table. (CCSS: 8.SP.4) I can use the relative frequencies and context of the problem to describe possible associations betwen the two sets of data. (CCSS: 8.SP.4)	
Common Core Standards	**Converted/Unpacked Standards**	
Standards for Mathematical Practice	**1. Make sense of problems and persevere in solving them.** **2. Reason abstractly and quantitatively.** **3. Construct viable arguments and critique the reasoning of others.** **4. Model with mathematics.** **5. Use appropriate tools strategically.** **6. Attend to precision.** **7. Look for and make use of structure.** **8. Look for and express regularity in repeated reasoning.**	