Grade Eight

Tecumseh School District
Math Curriculum Map

Quarter 1

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Define irrational numbers Show that the decimal expansion of rational numbers repeats eventually Convert a decimal expansion which repeats eventually into a rational number Show informally that every number has a decimal expansion			x	irrational numbers decimal expansion rational numbers
8.NS.A.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., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.4, and explain how to continue on to get better approximations.	Approximate irrational numbers as rational numbers. Approximately locate irrational numbers on a number line. Estimate the value of expressions involving irrational numbers using rational approximations. (For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.4, and explain how to continue on to get better approximations.) Compare the size of irrational numbers using rational approximations			x	irrational numbers rational numbers number line irrational numbers

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.EE.A.2 Use square root and cube root symbols to represent solutions to equations on 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 $\sqrt{2}$ is irrational.	Use square root and cube root symbols to represent solutions to equations on the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number Evaluate square roots of small perfect squares Evaluate cube roots of small perfect squares Know that the square root of 2 is irrational	x			square root cube root equations rational number perfect squares irrational
8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Recall the Pythagorean Theorem and its converse Determine how to create a right triangle from two points on a coordinate graph Use the Pythagorean Theorem to solve for the distance between the two points	x			Pythagorean Theorem right triangle distance between the two points
8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	Recall the Pythagorean Theorem and its converse Solve basic mathematical Pythagorean Theorem problems and its converse to find missing lengths of sides of triangles in two and three-dimensions. Apply Pythagorean Theorem in solving real-world problems dealing with two and three-dimensional shapes.	x			Pythagorean Theorem converse

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.G.B.6 Explain of proof of the Pythagorean Theorem and its converse	Define key vocabulary: square root, Pythagorean Theorem, right triangle, legs a & b, hypotenuse, sides, right angle, converse, base, eight, proof Be able to identify the legs and hypotenuse of a right triangle Explain a proof of the converse of the Pythagorean Theorem		x		square root Pythagorean Theorem right triangle legs a & b hypotenuse sides right angle converse base height proof
8.EE.C.7 Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions, Show which on 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).	Give examples of linear equations in one variable with one solution and show that the given example equation ;has one solution by successively transforming the equation into an equivalent equation of the form x = a. Give examples of linear equations in one variable with infinitely many solutions and show that the given example has infinitely many solutions by successively transforming the equation into an equivalent equation of the form a = a. Give examples of linear equations in one variable with no solution and show that the given example has no solution by successively transforming the equation into an equivalent equation of the form b = a, where a and b are different numbers	x			linear equations variable solution equation transforming the equation equivalent equation x = a
8.EE.C.7 Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms	Solve linear equations with rational number coefficients. Solve equations whose solutions require expanding expressions using the distributive property and/or collecting like terms.	x			linear equations rational number coefficients equations solutions expanding expressions distributive property collecting like terms

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.F.B.5 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	Analyze a graph and describe the functional relationship between two quantities using the qualities of the graph. Interpret the relationship between x and y values by analyzing a graph.	x			analyze graph describe functional relationship verbal description qualitative features interpret relationship between x and y values
8.F.A.1 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.		x			
8.EE.B.5 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 releationships. Interpret the unit rate of proportional relationships as the slope of the graph.	x			proportional relationships unit rate
8.F.A.3 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.	Recognize that linear function is graphed as a straight line. Recognize the equation y=mx+b is the equation of a function whose graph is a straight line where m is the slope and b is the y-intercept. Provide examples of nonlinear functions using multiple representations. Compare the characteristics of linear and nonlinear functions using various representations.	x			linear function straight line equation of a function m is the slope b is the y-intercept nonlinear function linear function

Quarter 2

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.EE.B.5 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.	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).	x			proportional relationships distance-time graph distance-time equation
8.F.B.4 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 tow (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.	Recognize that slope is determined by the constant rate of change. Recognize that the y-intercept is the initial value where x=0. Determine the rate of change from two(x,y) values, a verbal description, values in a table or graph. Determine the initial value from two (x,y) values, a verbal description, values in a table, or graph.	x			slope y-intercept rate of change verbal description table graph function model a linear relationship linear function table of values

8.EE.B.6 Use similar triangle 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 line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	Identify characteristics of similar triangles. Find the slope of a line. Determine the y-intercept of a line. Interpreting unit rate as the slope of the graph is included in 8.EE Analyze patterns for points on a line through the origin. Derive an equation of the form y = mx for a line through the origin. Analyze patterns for points on a line that do not pass through or include the origin. Derive an equation of the form y = mx + b for a line intercepting the vertical axis at b (the y-intercept)	x			similar triangles slope y-intercept origin equation y = mx derive equation y = mx + b intercepting vertical axis
8.F.A.1 Understand that a function is a rule that ssigns 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.		x			

8.F.A.3 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.	Recognize that linear function is graphed as a straight line. Recognize the equation y = mx + b is the equation of a function whose graph is a straight line where m is the slope and b is the y-intercept. Provide examples of nonlinear functions using multiple representations. Compare the characteristics of linear and nonlinear functions using various representations.	x			linear function straight line y = mx + b equation of a function m is the slope b is the y-intercept
8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Identify functions algebraically including slope and y intercept. Identify functions using graphs Identify functions using tables identify functions using verbal descriptions. Compare and contrast 2 functions with different representations. Draw conclusions based on different representations of functions.	x			functions slope y intercept graphs tables verbal compare contrast draw conclusions
8.EE.C.8 Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variable correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	Identify the solution(s) to a system of two linear equations in two variables as the point(s) of intersection of their graphs. Describe the point(s) of intersection between two lines as points that stisfy both equations simultaneously.	x			identify solution system of two linear equations two variables point of intersection equations

8.EE.C.8 Analyze and solve pairs of simultaneous linear equations. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspections.	Define inspection Identify cases in which a system of two equations in two unknowns has no solution Identify cases in which a system of two equations in two unknowns has an infinite number of solutions Solve a system of two equations (linear) in two unknowns algebraically Solve simple cases of systems of two linear equations in two variables by inspection. Estimate the point(s) of intersections for a system of two equations in two unknowns by graphing the equations.	x			inspection system of two equations two unknowns system of two equations infinite number of solutions linear in two unknowns algebraically systems of two linear equations two variables by inspection intersection
8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions	Explain the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$ Apply the properties of integer exponents to produce equivalent numerical expressions.	x			integer exponents numerical expressions integer exponents numerical expressions
8.EE.A.3 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.	Express numbers as a single digit times an integer power of 10 Use scientific notation to estimate very large and/or very small quantities Compare quantities to express how much larger one is compared to the other	x			integer power of 10 scientific notation

8.EE.A.4 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.	Perform operations using numbers expressed in scientific notations. Use scientific notation to express very large and very small quantities. Interpret scientific notation that has been generated by technology. Choose appropriate units of measure when using scientific notation.	x			scientific notation

Quarter 3

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.G.A.5 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.	Define similar triangles Define and identify transversals Identify angles created when parallel line is cut by transversal (alternate interior, alternate exterior, corresponding, vertical, adjacent, etc) Justify that the sum of interior angles equals 180. (For example, arrange three copies of the same triangle so that the three angles appear to form a line). Justify that the exterior angle of a triangle is equal to the sum of the two remote interior angles. Use Angle-Angle Criterion to prove similarity among triangles. (Give an argument in terms of transversals why this is so).	x			similar triangles define identify transversals angles parallel line transversal alternate interior alternate exterior corresponding, vertical adjacent sum of interior angles exterior angle triangle two remote interior angles Angle-angle Criterion
8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a dquence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	Define congruency Identify symbols for congruency Apply the concept of congruency to writhe congruent statements	x			congruency symbols for congruency congruent statements
8.G.A.4 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.	Define similar figures as corresponding angles are congruent and corresponding sides are proportional. Recognize symbol for similar. Apply the concept of similarity to write similarity statements.	x			similar figures corresponding angles are congruent corresponding sides are proportional symbol for similar similarity statements

8.EE.B.6 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 + b for a line intercepting the vertical axis at b	Identify characteristics of similar triangles Analyze patterns for points on a line through the origin. Analyze patterns for points on a line that do not pass through or nclude the origin 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	x			similar triangles origin slope m non-vertical coordinate plane
8.G.A.1 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.	Define and identify rotations, reflections, and translations.	x			define identify rotations reflections translations
8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations. b. Angles are taken to angles of the same measure.	Identify corresponding sides and corresponding angles Understand prime notation to describe an image after a translation, reflection, or rotation. Identify center of rotation Identify direction and degree of rotation	x			corresponding sides corresponding angles prime notation translation reflection rotation center of rotation direction of rotation degree of rotation
8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations. c. Parallel lines are taken to parallel lines	Identify line of reflection use physical models, transparencies, or geometry software to verify the properties of rotations, reflections, and translations (i.e., lines are taken to lines and line segments to line segments of the same length, angles are taken to angles of the same measure, and parallel lines are taken to parallel lines).	x			line of reflection properties of rotation properties of reflections properties of translation parallel lines

8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	Define dilations as a reduction or enlargement of a figure. Identify scale factor of the dilation Describe the effects of dilatoins, translations, rotations, and reflections on 2-D figures using coordiates.	x			dilations reduction enlargement scale factor of the dilation effects of dilations translations rotations reflections coordinates
8.G.A.2 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.	Define congruency Identify symbols for congruency Apply the concept of congruency to write congruent statements. Reason that a 2-D figure is congruent to another if the econd can be obtained bya sequence of rotations, reflections, translation. Describe the sequence of rotations, reflections, translations that exhibits the congruence between 2-D figures using words.	x			congruency symbols for congruency apply the concept congruent statements 2-D figure sequence rotation reflection translation exhibits the congruence
8.G.A.4 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.	Define similar figures as corresponding angles are congruent and corresponding sides are proportional. Recognize symbol for similar. Apply the concept of similarity statements. Reason that a 2-D figure is similar to another if the second can be obtained by a sequence of rotations, reflections, translations, or dilations that exhibits the similarity between 2-D figures using words and/or symbols.				

Quarter 4

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	identify and define vocabulary: cones, cylinder, sphere, radius, diameter, circumference, area, volume, pi, base, height Know formulas for volume of cones, cylinders, and spheres. Compare the volume of cones, cylinders, and spheres. Determine and apply appropriate volume formulas in order to solve mathematical and real-world problems for the given shape. Given the volume of a cone, cylinder, or sphere, find the radii, height, or approximate for π		x		identify define cone cylinder sphere radius diameter circumference area volume pi base height formulas volume of cones volume of cylinders volume of spheres volume formulas radii height approximate for π
8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	Recall the Pythagorean Theorem and its converse Solve basic mathematical Pythagorean Theorem problems and its onverse to find missing lengths of sides of triangles in two and three-dimensions. Apply Pythagorean Theorem in solving real-world problems dealing with two and three-dimensional shapes.	x			Phthagorean Theorem converse

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.SP.A.1 Construct and interpret scatter plots for bivariate measurement date to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. Construct scatter pots for bivariate measurement data. Interpret scatter plots for bivariate (two different variables such as distance and time) measurement data to investigate patterns of association between two quantities.			x	describe patterns clustering outliers positive association negative association linear association nonlinear association scatter plots bivariate measurement data bivariate measurement data association between two quantities
8.SP.A.2 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 straight are used to model relationships between two quantitative variables. Informally assess the model fit by judging the closeness of the data points to the line. Fit a straight line within the plotted data.			x	two quantitative variables informally assess
8.SP.A.3 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.	Find the slope and intercept of a linear equation. Interpret the meaning of the slope and intercept of a linear equation in terms of the situation. (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.) Solve problems using the equation of a linear model.			x	slope intercept of a linear equation equation of a linear model

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary
8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying 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.	Recognize patterns shown in comparison of two sets of data. Know how to construct a two-way table. Interpret the data in the two-way table to recognize patterns. (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?) Use relative frequencies of the data to describe relationships (positive, negative, or no correlation).			x	a two-way table relative frequencies of the data relationships positive negative no correlation

Standard	Learning Targets	Major	Additional	Supporting	Vocabulary