Grade 8 Mathematics 2015-2016

Suggested Timeframe	Objective(s)
20 Days Its in the System (Systems of Linear Equations)	SWBAT solve systems of linear SWBAT recognize linear equations in SWBAT solve systems of linear SWBAT describe situations in which a SWBAT fluently manipulate formulas
20 Days Growing Growing Growing (Exponential Functions)	SWBAT recognize exponential functions SWBAT identify situations that can be modeled with exponential functions

	SWBAT represent an exponential function with a table, graph, or equation	
	SWBAT identify growth/decay factor of an exponential function SWBAT compare exp. and linear functions	
	SWBAT write and interpret equivalent expressions using rules for exponents and operations, and scientific notation SWBAT solve problems that involve exponents	

	SWBAT develop the rules for operating with exponents and explain why they work
21 Days-Thinking with Mathematical Models (Linear and Inverse Variation)	Linear and Nonlinear Relationships

	SWBAT represent data patterns using graphs, tables, word descriptions, and algebraic expressions	
	SWBAT use mathematical models to answer questions about linear relationships	
	SWBAT write linear functions from verbal, numerical, or graphical information SWBAT analyze and solve linear equations	

	SWBAT model situations with inequalities expressed as "at most" and "at least" SWBAT compare, investigate the nature of inverse variations in contexts Data Analysis SWBAT analyze scatter plots of bivariate data to determine the strength of the linear association between the two variables. SWBAT use correlation coefficients informally to describe the strength of the linear association between two variables. SWBAT fit a line to data to show linear trend and measure closeness of fit SWBAT use data to make predictions
18 Days Pythagorean Theorem and Geometry	SWBAT use the Pythagorean Theorem to find the missing side of a right triangle

	SWBAT develop strategies for finding the distance between two points on a coordinate grid using the PT and distance formula. SWBAT use the PT to solve a variety of real world problems SWBAT explain a proof of the PT SWBAT to use the converse of the Pythagorean Theorem SWBAT interpret square roots of numbers by making use of their related geometric representations. SWBAT relate the area of a square to the side length of the square SWBAT estimate square and cube roots	

	SWBAT compare irrational and rational numbers SWBAT find the volume of different geomatric figures using volume formulas
17 Days Butterflies, Pinwheels, and Wallpaper (Symmetry and Transformations)	SWBAT recognize properties of reflection, rotation, and translation transformations. SWBAT explore techniques for using rigid motion transformations to createe symmetric desgins. SWBAT use coordinate rules for basic rigid motion transformations. SWBAT recognize when two figures are congruent and/or similar SWBAT use transformations in sequence

	SWBAT relate properties of angles formed by parallel lines and transversals.
14 Days-Function Junction (The Families of Functions)	SWBAT identify functions and compare and contrast functions using graphs, algebraic equations, and tables. SWBAT use concepts of functions to model relationships between quantities.

	SWBAT manipulate functions using algebra SWBAT determine if a realtion is a function or not. SWBAT create, analyze, write about, and solve real-world problems with the use of functions.

Concepts	Standard(s)
Linear equations, systems of linear equations, substitution, elimination, graphing linear equations, standard form, slope-intercept form, and solving for y.	CC.2.2.8.B.3 M08.B-E.3.1.1 Write and CC.2.2.8.B.1 Apply concepts of radicals
Exponential Functions, solving for y, create equations with exponential equations, identifying the growth or decay factor, writing in expanded and standard form, and writing in scientific notation	CC.2.2.8.C.2 M08.B-F.2.1.1Construct a

	CC.2.2.8.B.1 M08.B-E.1.1.1 Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. M08.B-E.1.1.2 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. Evaluate square roots of perfect squares Example: If x2 = 25 then x = ±√25. M08.B-E.1.1.3 Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions. M08.B-E.1.1.1 M08.B-E.1.1.2 M08.B-E.1.1.3 M08.B-E.1.1.4 A1.1.1.3.1	

Analyze and solve linear equations, represent data,writing linear functions, comparing inverse variations, data analysis, scatter plots, correlation cofficients	CC.2.2.8.B.2 M08.B-E.2.1.1 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. M08.B-E.2.1.2 Use similar right triangles to show and explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane. M08.B-E.2.1.3 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.

	CC.2.4.8.B.1 M08.D-S.1.1.1 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 correlation, linear association, and nonlinear association. M08.D-S.1.1.2 For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line. M08.D-S.1.1.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. CC.2.4.8.B.2 M08.D-S.1.2.1 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 associations between the two variables.	

Pythagorean Theorem, Converse of the Pythagorean Theorem, identifying the legs and hypotenuse of a right triangle, finding the square root of a number, and finding the volume of geometric figures.	CC.2.3.8.A.3 M08.C-G.2.1.1 Apply the converse of the Pythagorean theorem to show a triangle is a right triangle. M08.C-G.2.1.2 Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. M08.C-G.2.1.3 Apply the Pythagorean theorem to find the distance between two points in a coordinate system.

	CC.2.1.8.E.1 and CC.2.1.8.E.4 M08.A-N.1.1.1 Determine whether a number is rational or irrational. For rational numbers, show that the decimal expansion terminates or repeats (limit repeating decimals to thousandths). M08.A-N.1.1.2 Convert a terminating or repeating decimal to a rational number (limit repeating decimals to thousandths). M08.A-N.1.1.3 Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144). Example: √5 is between 2 and 3 but closer to 2. M08.A-N.1.1.4 Use rational approximations of irrational numbers to compare and order irrational numbers. M08.A-N.1.1.5 Locate/identify rational and irrational numbers at their approximate locations on a	

Transformations, comparing similar and congruent figures, finding the line of reflection, and finding the center of rotation.	CC.2.3.8.A.2 M08.C-G.1.1.1 Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations. M08.C-G.1.1.2 Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them. M08.C-G.1.1.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. M08.C-G.1.1.4 Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.

Determining what is a function, identify and compare functions, model functional relationships, manipulate functions.	CC.2.2.8.C.2 M08.B-F.2.1.1 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. M08.B-F.2.1.2 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 or determine a graph that exhibits the qualitative features of a function

	CC.2.2.8.C.1 M08.B-F.1.1.1 Determine whether a relation is a function. M08.B-F.1.1.2 Compare properties of two functions, each represented in a different way (i.e., algebraically, graphically, numerically in tables, or by verbal descriptions). 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. M08.B-F.1.1.3 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.

Vocabulary	Standards for Math Practice
feasible points, slope-intercept form, standard form, linear inequality, linear functions ,system of equations, system of inequalities, solution of the system.	1,2,3,4,5,6,7,8,
exponential form, exponent, base, standard form, expanded form, scientific notation, exponential growth factor, exponential functions, compound growth, growth rate, decay factor, exponential decay, rate	1,2,3,4,5,6,7,8

of decay, nth root	

additive inverse, categorical variables, correlation coefficient, function, inequality, inverse variation, linear relationship, mathematical models, multiplicative inverses, outlier, residual, line of best fit, slope, standard deviation, unit rate, y-intercept, variance.	
	1,2,3,4,5,6,7,8

acute triangle, cube root, hypotenuse, irrational number, legs, obtuse triangle, perpendicular, Pythagorean Theorem, radius, rational numbers, real numbers, repeating decimals, right triangle, square root, terminating decimal, and volume.	
	1,2,3,4,5,6,7,8

angle of rotation, basic design element, center of rotation, congruent figures, dilation, line of symmetry, line reflection, reflectional symmetry, rotation, rotational symmetry, similar figures, similarity transformation, symmetry, transformation, translation, translational symmetry	3,4,5,6

function, linear, exponent, coefficient, quadratic.	
	1,2,3,4,5,6,7,8