8th Grade Scope & Sequence

Days May Vary	Unit	Standard(s)/Outcome(s)	Essential/Guiding Questions
17-22	Unit 1: Solving Equations	• 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 (a and b are different numbers). • 8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. • A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters	• When can equations be applied to real-world situations? • How do you know when an equation has one solution, no solutions, or infinite solutions?

15-18	Unit 2: Radicals and the Pythagorean Theorem	● 8.EE.2: Evaluate square roots of small perfect squares and cube roots of small perfect cubes. ● 8.EE.2: 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. ● N.RN.A2 Rewrite expressions involving radicals and rational exponents using the properties of exponents. ● 8.NS.2: Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram ● 8.G.6: Explain a proof of the Pythagorean Theorem and its converse. ● 8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	● How are the properties of roots of real numbers used to evaluate and simplify radical expressions? ● How can we use the relationship among parts of a right triangle in real-life problems?
15-20	Unit 3: Integer Exponents and Scientific Notation	● 8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions. ● 8.EE.3: Use numbers expressed	● How are the properties of exponents of real numbers used to evaluate and simplify exponential expressions?

		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.* ● 8.EE.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.	● How are the exponent rules used to multiply or divide numbers written in scientific notation? ● How can scientific notation be used to compare extremely large and/or extremely small quantities?
21-27	Unit 4: Functions and Linear Equations	● 8.F.1: Understand that a function is a rule that assigns to each input exactly one output.	● How do you identify a function? ● How might a function

		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.EE.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.* ● 8.EE.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 ● 8.EE.6: 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. ● 8.F.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. *For example, the function $A = S_2$ giving the area of a square as a function of its side length is not*	represent a real-world situation? ● What is the relationship between the meaning of a slope in context and the corresponding graph? ● How is the concept of rate of change applied to real-life situations? ● What are the different ways to graph a linear equation?

		linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line. (SC 8) ● 8.F.2: 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.*	
12-16	Unit 5: Writing Functions	● 8.F.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. *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.* (SC 8) ● 8.F.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 two (x, y) values, including	● How does the symbolic form relate to the numeric, graphic, and verbal forms of linear equations?

		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. ● 8.SP.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.* ● 8.F.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.	
8-10	Unit 6: Bivariate Data and Statistics	● 8.SP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns	● How can linear functions be used to model data? ● How can we represent bivariate data with an equation? ● What are some practical

		such as clustering, outliers, positive or negative association, linear association, and nonlinear association. ● 8.SP.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. ● 8.SP.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.* ● 8.SP.4: 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	applications for line of best fit?

		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?*	