+ Curriculum Mapping Template

Name: **Eichorn/Maiorano, Parent** Subject Area: **8th grade Mathematics** Grade: 8 Year: 2014-2015

Timeline	Essential Questions/ Big Ideas	Content	Standards	Assessments
≈26 Days	• What are the key variables in the situation? • Is there a pattern relating the variables, is it strong enough to allow me to make predictions? • What is the pattern relating the variables? • What kind of equation will express the relationship? • How can I use the equation to answer questions about the relationship?	**CMP2/3: Thinking with Mathematical Models** • Represent data using graphs, tables, word descriptions and algebraic expressions • Recognize linear and nonlinear relationships in tables in graphs • Use linear and inverse variation equations to model bivariate data • Use residual analysis to measure the fit of linear and inverse variation models • Analyze, approximate, and solve linear equations • Use linear and inverse variation equations to solve problems and to make predictions and decisions • Use scatter plots, two-way tables, and correlation coefficients to describe patterns of association in pairs of variables • Use standard deviation to measure variability in data distributions	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. 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 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 with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. 8.EE.C.8 Analyze and solve pairs of simultaneous linear equations 8.EE.C.8.a Understand that solutions to a system of two linear equations in two variables corresponds to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously 8.EE.C.8.c Solve real-world problems leading to two linear equations in two variables 8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function	• Daily Check Ins • Homework • Quiz • Partner Quiz • Test • Unit Reflection

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			is the set of ordered pairs consisting of an input and the corresponding output 8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *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. 8.F.A.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 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.F.A.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.SP.A.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 association, linear association, and nonlinear association. 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	

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			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.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. 8.SP.A.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 categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	
≈29 Days	• What are the quantities in this problem? • Is the Pythagorean Theorem useful and appropriate in this situation? • How do I know? • Do I need to find the distance between two points? • How are the side length and the area of a square related? • How can I estimate the	**CMP2/3: Looking for Pythagoras** • Develop strategies for finding the distance between two points on a coordinate grid • Explain a proof of the Pythagorean Theorem • Understand and use the Pythagorean Theorem to solve everyday problems • Write fractions as repeating or terminating decimals • Write fractions as decimals • Recognize rational and irrational numbers	8.NS.A.1 Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational. 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). 8.EE.A.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. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	• Labsheets • Daily Check Ins • Homework • Quiz • Test • Math Reflection

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	square root or cube root of a number?	• Locate irrational numbers on a number line • Relate the area of a square to its side length, and the volume of a cube to its side length • Estimate square roots and cube roots	8.EE.C.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). 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. 8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse. 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. 8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	

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≈ 22 ½ Days	• How can I recognize whether the relationship between the variables is an exponential function? • What is the growth or decay factor? • What equation models the data in the table, graph, or problem situation? • What can I learn about this situation by studying a table or graph of the exponential function? • How can I answer questions about the problem situation by studying a table, graph, or equation that represents the exponential function?	**CMP2/3: Growing, Growing, Growing** • Identify situations in which a quantity grows or decays exponentially • Recognize the connections between the growth patterns in tables, graphs, and equations that represent exponential functions • Construct equations to express the relationship between the variables in an exponential function in data tables, graphs, and problem situations • Compare exponential and linear functions • Develop and use rules for working with exponents, including scientific notation, to write and interpret equivalent expressions • Solve problems about exponential growth and decay from a variety of different areas, including science and business	8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. 8.EE.A.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. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. 8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10s to estimate very large or very small quantities, and to express how many times as much one is than the other. 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. Interpret scientific notation that has been generated by technology. 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 8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *8.F.A.3* Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give	• Daily Check Ins • Homework • Quiz • Partner Quiz • Test • Unit Reflection

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			examples of functions that are not linear. 8.F.A.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 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.F.A.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.	
≈24 Days	• How can I use symmetry to describe the shape and properties of figures in a design or a problem? • What figures in a pattern are congruent? • What parts of congruent figures will be matched by a congruence	**CMP3: Butterflies, Pinwheels, and Wallpaper** • Identify figures that have different kinds of symmetry • Describe types of symmetry using reflections, rotations, and translation • Use symmetry transformations to compare the size and shape of figures to see whether they are congruent or similar • Identify congruent and similar	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 for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. 8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations. 8.G.A.1a Lines are taken to lines, and line segments to line segments of the same length. 8.G.A.1b Angles are taken to angles of the same measure.	• Daily Check Ins • Homework • Quiz • Partner Quiz • Test • Unit Reflection

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	transformation? • What figures in a problem are similar?	triangles and quadrilaterals efficiently • Use properties of congruent and similar triangles to solve problems about shapes and measurements	8.G.A.1c Parallel lines are taken to parallel lines. 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 8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. 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. 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. 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 why this is so	

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≈ **25 Days**	• What expression or equation represents the pattern or relationship in a context? • Can you write an equivalent expression for a given expression to provide new information about a relationship? • What operations can transform a given equation or expression into an equivalent form that can be used to answer a question? • How can symbolic reasoning help confirm a conjecture?	**CMP2/3: Say It With Symbols** • Represent patterns and relationships in symbolic forms • Determine when different symbolic expressions are mathematically equivalent • Write algebraic expression in useful equivalent forms • Combine symbolic expression s using algebraic operations to form new expressions • Analyze expressions or equations to determine the patterns of change in the tables and graphs that the expression or equation represents • Solve linear and quadratic equations using symbolic reasoning • Use algebraic reasoning to validate generalizations and conjectures	8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form x2= 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. 8.EE.C.8 Analyze and solve pairs of simultaneous linear equations. 8.EE.C.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. 8.EE.C.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 8.EE.C.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 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 8.F.A.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	• Daily Check Ins • Homework • Quiz • Partner Quiz • Test • Unit Reflection

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			of change. 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. For example: the function A = s2 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. 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 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 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 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	

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≈ 20 ½ Days	• What are the variables in this problem? • Does the problem call for solving a system of equations or inequalities relating those variables? • What strategy will be most effective in solving the system?	**CMP3 It's in the System** • Solve linear equations and systems of linear equations with two variables • Solve linear inequalities and systems of inequalities with two variables • Use systems of linear equations and inequalities to solve problems	8.EE.C.8 Analyze and solve pairs of simultaneous linear equations. 8.EE.C.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. 8.EE.C.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 8.EE.C.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 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. For example: the function A = s2 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	• Daily Check Ins • Homework • Quiz • Partner Quiz • Test • Unit Reflection

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(≈ 1 week)	Are you ready for the math PARCC?	Review for PARCC	All standards	•Daily Warm Ups •Homework Assignments
(≈2.5 weeks)		Project	Review of all skills from throughout the year.	Class work, observations, grading of projects