Cartersville Middle School Curriculum Map — 8th Grade Math

	Essential Standard(s)	Learning Targets for Essential Standards	Supporting Standards	Learning Targets for Supporting Standards
Unit 1 (24 Days) Transformations Congruence and Similarity	**MGSE8.G.2** Understand that a two dimensional figure is congruent to another if can be created by a sequence of translations, rotations or reflections. **MGSE8.G.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.	I can translate, reflect, rotate and dilate two-dimensional figures. I can describe and perform a sequence of transformations. I can use a sequence of translations, reflections, and rotations to show that figures are congruent. I can use a sequence of transformations, including dilations, to show that figures are similar.	**MGSE8.G.1** Verify experimentally the congruence properties of rotations, reflections, and translations. **MGSE8.G.3** Describe the effect of dilations, translations, rotations and reflections on two dimensional figures using coordinates. **MGSE8.G.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.	I can prove that figures are congruent after being rotated, translated and reflected. I can identify and find the measures of angles formed by parallel lines and a transversal. I can find the interior and exterior angle measures of a triangle.
Unit 2 (42 Days) Exponents and Equations	**MGSE8.EE.7** Solve linear equations in one variable.	I can solve multi-step equations. I can use multi-step equations to model and solve real-life problems.	**MGSE8.EE.7a** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. **MGSE8.EE.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. **MGSE8.EE.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions.	I can determine the number of solutions an equation has. I can identify if a number is rational or irrational. I can compare and order rational and irrational numbers. I can find square roots and cube roots of rational numbers. I can solve equations including squares or cubes. I can use properties of exponents to write equivalent expressions.

			MGSE8.EE.2 Use square root and cube root symbols to represent solutions to equations. Recognize that $x^2 = p$ has 2 solutions and $x^3 = p$ has one solution. Evaluate square roots of perfect squares < 625 and cube roots of perfect cubes > -1000 and < 1000. **MGSE8.EE.3** Use numbers expressed in scientific notation to estimate very large or very small quantities, and to express how many times as much one is than the other. **MGSE8.EE.4** Add, subtract, multiply and divide numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Understand 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 (e.g. calculators). **MGSE8.NS.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. **MGSE8.NS.2** Use rational approximation of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line, and estimate the value of expressions	I can use scientific notation to write very large or very small numbers. I can perform operations with numbers in scientific notation.

Unit 3 (15 Days) Geometric Applications of Exponents	**MGSE8.G.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensional.	I can use the Pythagorean Theorem to find unknown sides of triangles. I can use the Pythagorean Theorem to solve problems.	**MGSE8.G.6** Explain a proof of the Pythagorean Theorem and its converse. **MGSE8.G.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system **MGSE8.G.9** Apply the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	I can use the Converse of the Pythagorean Theorem to identify right triangles. I can use the Pythagorean Theorem to find the distance between two points on a coordinate plane. I can find the volume of a cylinder, cone and sphere.
Unit 4 (10 Days) Functions	**MGSE8.F.1** Understand that a function is a rule that assigns to each input exactly one output.	I can tell whether a relation is a function. I can identify functions by their equations, tables and graphs.	**MGSE8.F.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). **MGSE8.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.	I can compare linear and nonlinear functions. I can describe the behavior of a function and write a description to go with its graph.
Unit 5 (18 Days) Linear Functions	**MGSE8.EE.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **MGSE8.F.4** Construct a function to model a linear relationship between two quantities. Determine and interpret the rate of change and initial value of the function from a description, two points, a table or from a graph.	I can identify slope(ROC) from a graph, two points, a table and an equation. I can identify the y-intercept (initial value) from a graph, two points, a table and an equation. I can graph a linear function. I can write equations to describe linear relationships.	**MGSE8.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; 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 understand the slope of a line. I can find the y-intercept of a graph and explain what it means. I can derive the equation $y = mx + b$.

Unit 6 (19 Days) Solving Systems of Linear Equations	**MGSE8.EE.8** Analyze and solve pairs of simultaneous linear equations (systems of linear equations).	I can solve a system of equations by graphing, substitution and elimination. I can solve real world problems that involve two linear equations.	**MGSE8.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. **MGSE8.EE.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. **MGSE8.EE.8c** Solve real-world and mathematical problems leading to two linear equations in two variables.	I can solve simple cases by inspection.
Unit 7 (10 Days) Linear Models and Tables	**MGSE8.SP.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.	I can use scatter plots to describe relationships between data. I can find an equation of a line of best fit. I can use a line of best fit to make predictions.	**MGSE8.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 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. **MGSE8.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.	I can construct a scatter plot and use it to understand the relationship between paired data. I can use a line to represent the relationship between the paired data. I can make a prediction by using the equation of a line that closely fits a set of data. I can display and interpret relationships between paired categorical data. I can find the relative frequencies of two-way tables and interpret what they mean.

			MGSE8.SP.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. **MGSE8.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. **MGSE8.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. a. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. b. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	