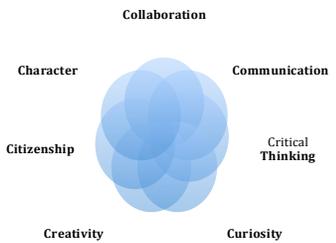


Content Area: Mathematics	Course: Grade 8 Math	Grade Level: Grade 8
	<p><b>R14 The Seven Cs of Learning</b></p> 	
Unit Titles	Length of Unit	
Geometric Transformations	6 weeks	
Exponents and the Number System	5 weeks	
Linear Relationships	10 weeks	
Systems of Equations	5 weeks	
Geometric Applications	4 weeks	
Statistical Modeling and Reasoning	5 weeks	

Strands	Course Level Expectations
<b>The Number System</b>	<ul style="list-style-type: none"> <li>• 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</li> </ul>
<b>Expressions &amp; Equations</b>	<ul style="list-style-type: none"> <li>• Use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems</li> <li>• Solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane</li> <li>• Graph proportional relationships, interpreting the unit rate as the slope of the graph.</li> <li>• Compare two different proportional relationships represented in different ways</li> <li>• Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.</li> <li>• Know and apply the properties of integer exponents to generate equivalent numerical expressions</li> <li>• Use scientific notation to represent very small and very large quantities and perform operations with numbers expressed in scientific notation</li> </ul>
<b>Functions</b>	<ul style="list-style-type: none"> <li>• Define, evaluate, and compare functions</li> <li>• Construct a function to model a linear relationship between two quantities</li> </ul>

<b>Strands</b>	<b>Course Level Expectations</b>
<b>Geometry</b>	<ul style="list-style-type: none"> <li>• Use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems</li> <li>• Understand the statement of the Pythagorean Theorem and its converse, and apply it to find distances between points on the coordinate plane, to find lengths, and to analyze polygons.</li> <li>• Solve problems involving the volume of cones, cylinders, and spheres.</li> </ul>
<b>Statistics &amp; Probability</b>	<ul style="list-style-type: none"> <li>• Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table</li> <li>• Use a linear equation to describe the association between two quantities in bivariate data</li> <li>• Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities</li> </ul>

<b>Unit Title</b>	<b>Geometric Transformations</b>	<b>Length of Unit</b>	6 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• How do transformations affect the properties and characteristics of a given figure?</li> <li>• How can similarity and congruence be proved?</li> <li>• How are deducing facts about angle measure helpful in solving certain geometric problems?</li> </ul>
<b>Standards</b>	<b>Geometry:</b> 8.G.A.1, 8.G.A.2, 8.G.A.3, 8.G.A.4, 8.G.A.5
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Rigid and nonrigid transformations</li> <li>• Similarity and Congruence</li> <li>• Deductive reasoning</li> </ul>
<b>Key Vocabulary</b>	Translations, rotations, reflections, line of reflection, center of rotation, clockwise, counterclockwise, parallel lines, congruence, similarity, dilations, pre-image, image, rigid transformations, exterior angles, interior angles, alternate interior angles, angle-angle criterion, vertical angles, adjacent, supplementary, complementary, corresponding, scale factor, transversal, parallel

<b>Unit Title</b>	<b>Geometric Transformations</b>	<b>Length of Unit</b>	6 weeks
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<b>Critical Content:</b> My students will <b>Know</b> ...	<b>Key Skills:</b> My students will be able to <b>(Do)</b> ...
<ul style="list-style-type: none"> <li>• Rigid motions preserve the lengths of line segments and the measurements of angles.</li> <li>• 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</li> <li>• A two-dimensional figure is similar to another</li> <li>• if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations</li> <li>• Shape is preserved under dilations, but that size is not preserved unless <math>r = 1</math>.</li> </ul>	<ul style="list-style-type: none"> <li>• Verify experimentally the properties of rotations, reflections, and translations</li> <li>• Describe a sequence that exhibits the congruence between two congruent figures.</li> <li>• Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</li> <li>• Describe a sequence that exhibits the similarity between two congruent two-dimensional figures.</li> <li>• Use informal arguments to establish facts about the angle sum and exterior angle of triangles,</li> <li>• Justify an informal argument explaining the angles created when parallel lines are cut by a transversal,</li> <li>• Justify an informal argument explaining the angle-angle criterion for similarity of triangles.</li> </ul>

<b>Assessments:</b>	Performance task focused on rigid and nonrigid transformations, justifying similarity and congruence, establishing informal arguments to prove characteristics and properties of angle measure
<b>Teacher Resources:</b>	Engage NY, 3 Act Task Bank, CCSS aligned anchor tasks, Illustrative Mathematics, Georgia Department of Education CCSS aligned tasks, North Carolina Department of Instruction, CCSS aligned tasks.

<b>Unit Title</b>	<b>Exponents and the Number System</b>	<b>Length of Unit</b>	5 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• Can all numbers be represented as fractions and decimals?</li> <li>• Are there more efficient ways to represent very large or very small quantities?</li> <li>• Do the properties of operations hold when working with exponents?</li> </ul>
<b>Standards</b>	<p><b>Number System:</b> 8.NS.A.1, 8.NS.A.2,</p> <p><b>Expressions and Equations:</b> 8.EE.A.1, 8.EE.A.2, , 8.EE.A.3, , 8.EE.A.4</p>
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• System of real numbers</li> <li>• Exponentiation</li> <li>• Equivalence</li> <li>• Properties of operations</li> </ul>
<b>Key Vocabulary</b>	Real Numbers, Irrational numbers, Rational numbers, radical, radicand, square roots, perfect squares, cube roots, terminating decimals, repeating decimals, truncate, laws of exponents, power, perfect cubes, scientific notation

<b>Unit Title</b>	<b>Exponents and the Number System</b>	<b>Length of Unit</b>	5 weeks
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<b>Critical Content:</b> My students will <b>Know</b> ...	<b>Key Skills:</b> My students will be able to <b>(Do)</b> ...
<ul style="list-style-type: none"> <li>• Every number has a decimal expansion</li> <li>• Non-perfect squares and non-perfect cubes are irrational.</li> <li>• The laws of exponents as well as why they work in mathematics</li> </ul>	<ul style="list-style-type: none"> <li>• Convert a decimal expansion which repeats eventually into a rational number</li> <li>• Use rational approximations of irrational numbers to compare the size of irrational numbers</li> <li>• Locate irrational numbers approximately on a number line diagram, and estimate the value of expressions that include irrational numbers</li> <li>• Apply the properties of integer exponents to generate equivalent numerical expressions.</li> <li>• Evaluate square roots of small perfect squares and cube roots of small perfect cubes</li> <li>• Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate and make comparisons among very large or very small quantities</li> <li>• Perform operations with numbers expressed in scientific notation</li> </ul>

<b>Assessments:</b>	Performance task focused on representing rational and irrational numbers, operating with exponents, interpreting and representing quantities represented in scientific notation, evaluating square and cube roots
<b>Teacher Resources:</b>	Glencoe Math, Engage NY, 3 Act Task Bank, CCSS aligned anchor tasks, Illustrative Mathematics, Georgia Department of Education CCSS aligned tasks, North Carolina Department of Instruction, CCSS aligned tasks.

<b>Unit Title</b>	<b>Linear Relationships</b>	<b>Length of Unit</b>	10 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• How can linear relationships be represented?</li> <li>• How are functions represented mathematically and in real world contexts?</li> <li>• In what ways can two quantities be related?</li> </ul>
<b>Standards</b>	<p><b>Expressions and Equations:</b> 8.EE.B.5, 8.EE.B.6,</p> <p><b>Functions:</b> 8.F.A.1, 8.F.A.2, 8.F.A.3, 8.F.A.4, 8.F.A.5</p>
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Proportionality</li> <li>• Sequential analysis</li> <li>• Equivalence</li> <li>• Dependent and independent relationships</li> <li>• Structure of equations, inequalities, and expressions</li> </ul>
<b>Key Vocabulary</b>	Slope, similar triangles, y-intercept, functions, y-value, x-value, vertical line test, input, output, rate of change, linear function, non-linear function

<b>Unit Title</b>	<b>Linear Relationships</b>	<b>Length of Unit</b>	10 weeks
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<b>Critical Content: My students will Know...</b>	<b>Key Skills: My students will be able to (Do)...</b>
<ul style="list-style-type: none"> <li>• The relationship between the graph of a proportional relationship and its equation <math>y = mx</math> as a special case of the relationship between a line and its equation <math>y = mx + b</math>, with <math>b = 0</math>.</li> <li>• Unit rate is synonymous with the the slope of the graph of an equation</li> <li>• Slope is constant between any two points on a non-vertical line</li> <li>• The slope of a vertical line is undefined and the slope of a horizontal line is 0.</li> <li>• The graph of a function is the set of ordered pairs consisting of an input and the corresponding output</li> <li>• The graph of a linear function is a line</li> <li>• A linear function does not have a slope yet the graph of a non-vertical line has a slope</li> <li>• Graphically, a linear function is a proportional relationship if its graph goes through the origin</li> <li>• Some linear functions are proportional relationships and some are not</li> </ul>	<ul style="list-style-type: none"> <li>• Compare two different proportional relationships represented in different ways</li> <li>• Graph proportional relationships</li> <li>• Use similar triangles to explain why the slope <math>m</math> is the same between any two distinct points on a non-vertical line in the coordinate plane</li> <li>• Derive the equation <math>y = mx</math> for a line through the origin and the equation <math>y = mx + b</math> for a line intercepting the vertical axis at <math>b</math>.</li> <li>• Compare properties of two functions each represented in a different way</li> <li>• Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line</li> <li>• Give examples of functions that are not linear and justify their choices</li> <li>• Construct a function to model a linear relationship between two quantities</li> <li>• Determine the rate of change and initial value of a function from a description of a relationship, from two <math>(x,y)</math> values, in terms of the situation it models, and in terms of its graph or a table of values.</li> <li>• Describe qualitatively the functional relationship between two quantities by analyzing a graph</li> <li>• Sketch a graph that exhibits the qualitative features of a function that has been described verbally.</li> </ul>

<b>Assessments:</b>	Performance task focused on representing linear relationships in multiple ways, linear vs. nonlinear relationships, deriving and applying the equation of a line, constructing and analyzing linear functions
<b>Teacher Resources:</b>	Glencoe Math, Engage NY, 3 Act Task Bank, CCSS aligned anchor tasks, Illustrative Mathematics, Georgia Department of Education CCSS aligned tasks, North Carolina Department of Instruction, CCSS aligned tasks.

<b>Unit Title</b>	<b>Systems of Equations</b>	<b>Length of Unit</b>	5 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What strategies are most efficient strategies in solving simultaneous linear equations?</li> <li>• In what context is a system of linear equations helpful in solving a given problem?</li> <li>• How does the algebraic solution to a pair of simultaneous linear equations relate to its graphical representation?</li> </ul>
<b>Standards</b>	<b>Expressions and Equations:</b> 8.EE.C.7, 8.EE.C.8
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Properties of operations</li> <li>• Structure of equations, inequalities, and expressions</li> <li>• Equivalence</li> <li>• Connection between algebraic and geometric solutions</li> </ul>
<b>Key Vocabulary</b>	Substitution, system of linear equations, distributive property, like terms

<b>Unit Title</b>	<b>Systems of Equations</b>	<b>Length of Unit</b>	5 weeks
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<b>Critical Content: My students will Know...</b>	<b>Key Skills: My students will be able to (Do)...</b>
<ul style="list-style-type: none"> <li>Equations have one solution when the variables do not cancel out.</li> <li>Equations having no solution have variables that will cancel out and constants that are not equal.</li> <li>An equation with infinitely many solutions occurs when both sides of the equation are the same.</li> <li>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.</li> <li>Graphed lines with one point of intersection (different slopes) will have one solution, parallel lines (same slope, different y-intercepts) have no solutions, and lines that are the same (same slope, same y-intercept) will have infinitely many solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Solve one-variable equations including those with the variables being on both sides of the equals sign</li> <li>Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions</li> <li>Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.</li> <li>Analyze and solve pairs of simultaneous linear equations.</li> <li>Graph a system of two linear equations, recognizing that the ordered pair for the point of intersection is the x-value that will generate the given y-value for both equations.</li> <li>Define variables and create a system of linear equations in two variables</li> <li>Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations</li> <li>Solve real-world and mathematical problems leading to two linear equations in two variables</li> </ul>

<b>Assessments:</b>	Performance task focused on strategies for interpreting and solving a system of linear equations, graphing linear equations, and creating a system of linear equations to solve real world and mathematical problems
<b>Teacher Resources:</b>	Glencoe Math, Engage NY, 3 Act Task Bank, CCSS aligned anchor tasks, Illustrative Mathematics, Georgia Department of Education CCSS aligned tasks, North Carolina Department of Instruction, CCSS aligned tasks.

<b>Unit Title</b>	<b>Geometric Applications</b>	<b>Length of Unit</b>	4 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• How is the Pythagorean Theorem useful in solving certain types of problems?</li> <li>• How is the volume of certain three-dimensional figures related?</li> </ul>
<b>Standards</b>	<b>Geometry:</b> 8.G.B.6, 8.G.B.7, 8.G.B.8, 8.G.C.9
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Spatial reasoning</li> <li>• Geometric Attributes</li> <li>• Two and three-dimensional space</li> <li>• Similarity and congruence</li> <li>• Geometric composition/decomposition</li> <li>• Geometric proof</li> </ul>
<b>Key Vocabulary</b>	right triangle, hypotenuse, legs, Pythagorean Theorem, Pythagorean triple, cones, cylinders, spheres, radius, volume, height

<b>Unit Title</b>	<b>Geometric Applications</b>	<b>Length of Unit</b>	4 weeks
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<b>Critical Content:</b> My students will <b>Know</b> ...	<b>Key Skills:</b> My students will be able to <b>(Do)</b> ...
<ul style="list-style-type: none"> <li>• A triangle with side lengths satisfying <math>c^2=a^2+b^2</math> must be a right triangle with the right angle opposite the side of length <math>c</math></li> <li>• Why the Pythagorean Theorem works</li> <li>• The relationship between the volume of a cylinder and the volume of a cone</li> <li>• The volume of a sphere based on their prior understanding of the volume of a cylinder</li> </ul>	<ul style="list-style-type: none"> <li>• Explain a proof of the Pythagorean Theorem and its converse.</li> <li>• Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</li> <li>• Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</li> <li>• Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems</li> </ul>

<b>Assessments:</b>	Performance task focused on applying the Pythagorean Theorem, as well as finding the volumes of cones, cylinders, and spheres in context
<b>Teacher Resources:</b>	Glencoe Math, Engage NY, 3 Act Task Bank, CCSS aligned anchor tasks, Illustrative Mathematics, Georgia Department of Education CCSS aligned tasks, North Carolina Department of Instruction, CCSS aligned tasks.

<b>Unit Title</b>	<b>Statistical Modeling and Reasoning</b>	<b>Length of Unit</b>	5 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• How can the relationship between two variables be modeled?</li> <li>• How is the equation of a linear model helpful in explaining the relationship between two quantitative variables?</li> <li>• How can data from different samples be represented and summarized?</li> </ul>
<b>Standards</b>	<b>Statistics &amp; Probability:</b> 8.SP.A.1, 8.SP.A.2, 8.SP.A.3, 8.SP.A.4
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Statistical modeling</li> <li>• Relative frequency</li> <li>• Statistical Inferencing</li> <li>• Patterns of association</li> <li>• Linear and nonlinear relationships</li> </ul>
<b>Key Vocabulary</b>	bivariate data, scatter plot, linear model, clustering, linear association, non-linear association, outliers, positive association, negative association, categorical data, two-way table, relative frequency

<b>Unit Title</b>	<b>Statistical Modeling and Reasoning</b>	<b>Length of Unit</b>	5 weeks
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<b>Critical Content:</b> My students will <b>Know</b> ...	<b>Key Skills:</b> My students will be able to <b>(Do)</b> ...
<ul style="list-style-type: none"> <li>• Straight lines are widely used to model relationships between two quantitative variables.</li> <li>• Outliers have an effect on a linear model</li> <li>• The most appropriate linear model is the line that comes closest to most data points</li> <li>• Patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table</li> </ul>	<ul style="list-style-type: none"> <li>• Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities.</li> <li>• Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</li> <li>• Informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line (For scatter plots that suggest a linear association)</li> <li>• Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</li> <li>• Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.</li> <li>• Use relative frequencies calculated for rows or columns in a two-way table to describe possible association between the two variables</li> </ul>
<b>Assessments:</b>	Performance task focused on modeling the relationship between quantitative variables in various ways, interpreting the relationship between sets of bivariate data, formulating and using the equation of a linear model to solve problems in the context of bivariate measurement data
<b>Teacher Resources:</b>	Glencoe Math, Engage NY, 3 Act Task Bank, CCSS aligned anchor tasks, Illustrative Mathematics, Georgia Department of Education CCSS aligned tasks, North Carolina Department of Instruction, CCSS aligned tasks.