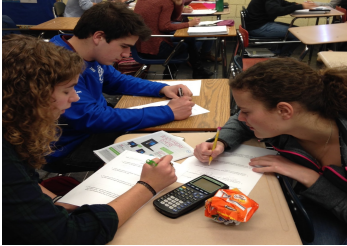
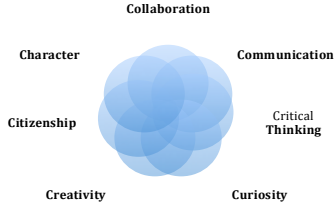


Content Area: Mathematics	Course: Algebra 1	Grade Level: Eight-Tenth
	<p><b>R14 The Seven Cs of Learning</b></p> 	
Unit Titles	Length of Unit	
<ul style="list-style-type: none"> <li>Patterns</li> </ul>	2-3 weeks	
<ul style="list-style-type: none"> <li>Solving Equations and Inequalities</li> </ul>	2-3 weeks	
<ul style="list-style-type: none"> <li>Functions</li> </ul>	3-5 weeks	
<ul style="list-style-type: none"> <li>Linear Functions</li> </ul>	4-5 weeks	
<ul style="list-style-type: none"> <li>Scatterplots and Trend lines</li> </ul>	4-6 weeks	
<ul style="list-style-type: none"> <li>Systems of Linear Equations</li> </ul>	3-4 weeks	
<ul style="list-style-type: none"> <li>Exponential Functions</li> </ul>	3-4 weeks	
<ul style="list-style-type: none"> <li>Quadratic Functions</li> </ul>	4-6 weeks	
<ul style="list-style-type: none"> <li>Simplifying Radicals</li> </ul>	2-3 weeks	



Strands	Course Level Expectations
The Real Number System	<ul style="list-style-type: none"> <li>• Extend the properties of exponents to rational exponents.</li> <li>• Use properties of rational and irrational numbers.</li> </ul>
Quantities	<ul style="list-style-type: none"> <li>• Reason quantitatively and use units to solve problems. Foundation for work with expressions, equations and functions.</li> </ul>
Seeing Structure in Expressions	<ul style="list-style-type: none"> <li>• Interpret the structure of expressions. Linear, exponential, quadratic</li> <li>• Write expressions in equivalent forms to solve problems. Quadratic and exponential.</li> </ul>
Arithmetic with Polynomials and Rational Expressions	<ul style="list-style-type: none"> <li>• Perform arithmetic operations on polynomials (Linear and quadratic)</li> </ul>
Creating Equations	<ul style="list-style-type: none"> <li>• Create equations that describe numbers or relationships. Linear, quadratic, and exponential (integer inputs only)</li> </ul>

Strands	Course Level Expectations
Reasoning with Equations and Inequalities	<ul style="list-style-type: none"> <li>• Understand solving equations as a process of reasoning and explain the reasoning</li> <li>• Solve equations and inequalities in one variable. Linear inequalities; literal that are linear in the variables being solved for; quadratics with real solutions</li> <li>• Solve systems of equations. Linear-linear and linear quadratic</li> <li>• Represent and solve equations and inequalities graphically. Linear and exponential; learn as general principle</li> </ul>
Interpreting Functions	<ul style="list-style-type: none"> <li>• Understand the concept of a function and use function notation. Learn as general principle; focus on linear and exponential and on arithmetic and geometric sequences</li> <li>• Interpret functions that arise in applications in terms of a context. Linear, exponential, and quadratic</li> <li>• Analyze functions using different representations. Linear, exponential, quadratic, absolute value, step, piecewise defined</li> </ul>
Building Functions	<ul style="list-style-type: none"> <li>• Build a function that models a relationship between two quantities.</li> <li>• Build new functions from existing functions. Linear, exponential, quadratic, and absolute value;</li> </ul>
Linear, Quadratic, and Exponential Models	<ul style="list-style-type: none"> <li>• Construct and compare linear, quadratic, and exponential models and solve problems</li> <li>• Interpret expressions for functions in terms of the situation they model. Linear and exponential of form <math>f(x)=b x +k</math></li> </ul>
Interpreting Categorical and Quantitative Data	<ul style="list-style-type: none"> <li>• Summarize, represent, and interpret data on a single count or measurement variable.</li> <li>• Summarize, represent, and interpret data on two categorical and quantitative variables. Linear focus, discuss general principle</li> <li>• Interpret linear models</li> </ul>

<b>Unit Title</b>	<b>Patterns</b>	<b>Length of Unit</b>	2-3 weeks
<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What is algebra and what is an algebraic expression?</li> <li>• What is a variable?</li> <li>• What is a sequence?</li> <li>• How can patterns be represented?</li> <li>• What are the advantages and disadvantages of a recursive rule compared to an explicit rule</li> <li>• What processes are used in real world mathematics to create and analyze patterns?</li> </ul>		
<b>Standards</b>	<b>Interpreting Functions:</b> F-IF- 3, <b>Building Functions:</b> F-BF- 1, F-BF – 2		
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Sequences,</li> <li>• Recursive Rule</li> <li>• Explicit Rule</li> </ul>		
<b>Key Vocabulary</b>	Arithmetic Sequence, Explicit Rule, Fractal, Geometric Sequence, Integer, Recursive Rule		

<b>Unit Title</b>	<b>Patterns</b>	<b>Length of Unit</b>	2-3 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 fundamental structure of algebra provides a systematic method for identifying, describing, extending, analyzing and generalizing patterns</li> <li>• A variable is a letter that represents a number.</li> <li>• An algebraic expression allows us to represent a situation using letters and numbers and to perform arithmetic operations on the expression.</li> <li>• A sequence is a pattern of numbers that can be arithmetic or geometric.</li> <li>• Patterns can be represented using either recursive or explicit rules.</li> <li>• Analyzing patterns and writing recursive and explicit algebraic rules provides a powerful way to extend patterns and make predictions.</li> <li>• The practice of mathematics includes making conjectures, reducing the complexities of data sets, justifying claims, using symbolic notation efficiently and making generalizations through inductive and deductive reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>• Interpret expressions that represent a quantity in terms of its context.</li> <li>• Interpret parts of an expression, such as terms, factors, and coefficients.</li> <li>• Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and simple exponential functions.</li> <li>• Write a function that describes a relationship between two quantities.</li> <li>• Determine an explicit expression, a recursive process, or steps for calculation from a context.</li> <li>• Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.</li> <li>• Distinguish between situations that can be modeled with linear functions and with exponential functions.</li> <li>• Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</li> <li>• Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</li> <li>• Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</li> </ul>

<b>Assessments:</b>	<ul style="list-style-type: none"> <li>• Formative, interims, and summative assessments.</li> </ul>
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Litell, 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>Solving Equations and Inequalities</b>	<b>Length of Unit</b>	2-3 weeks
<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What is an equation? Inequality?</li> <li>• How can we use linear equations and linear inequalities to solve real world problems?</li> <li>• What is a solution set for a linear equation or linear inequality?</li> </ul>		
<b>Unit Strands &amp; Standards</b>	<p><b>Expressions and Equations:</b> EE. 7,</p> <p><b>Seeing Structure in Expressions:</b> A-SSE 1, A-SSE 3,</p> <p><b>Creating Equations:</b> A-CED 1, A-CED 4</p> <p><b>Reasoning with Equations &amp; Inequalities</b> A-REI 1, A-REI</p> <p><b>Number and Quantities:</b> N-Q 1, N-Q 2, N-Q 3</p>		
<b>Unit Strands &amp; Concepts</b>	Interpret the structure of Expressions, write expressions in equivalent form to solve problems, create equations that describe numbers or relationships, solve equations and inequalities in one variable, understand solving equations as a process of reasoning and explain the reasoning, reason quantitatively and use units to solve problems		
<b>Key Vocabulary</b>	Algebraic expression, coefficient, distributive property, inequality symbol, integers, inverse operations, linear inequalities, literal equations, order of operations, properties of equality, real numbers, variable		

<b>Unit Title</b>	<b>Solving Equations and Inequalities</b>	<b>Length of Unit</b>	2-3 weeks
<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>the properties of equality and how to use them in solving equations and inequalities.</li> <li>multistep equations</li> <li>linear equations</li> <li>linear inequalities</li> <li>strategies for solving equations</li> </ul>	<ul style="list-style-type: none"> <li>Interpret expressions that represent a quantity in terms of its context.</li> <li>Interpret parts of an expression, such as terms, factors, and coefficients.</li> <li>Interpret complicated expressions by viewing one or more of their parts as a single entity.</li> <li>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</li> <li>Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear functions.</i></li> <li>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's Law <math>V=IR</math> to highlight resistance, <math>R</math>.</i></li> <li>Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</li> <li>Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</li> <li>Write a function that describes a relationship between two quantities.</li> <li>Determine an explicit expression, a recursive process, or steps for calculation from a context.</li> </ul>		
<b>Assessments:</b>	<ul style="list-style-type: none"> <li>Formative, interims, and summative assessments.</li> </ul>		
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Litell, 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>	Functions	<b>Length of Unit</b>	3-5 weeks
<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What is a function?</li> <li>• What are the different ways in which functions may be represented?</li> <li>• How can functions be used to model real world situations, make predictions, and solve problems?</li> </ul>		
<b>Standards</b>	<p><b>Functions:</b> F1, F2, F3, 8F 5,</p> <p><b>Creating Equations:</b> A-CED 2., A-CED 10,</p> <p><b>Interpreting Functions:</b> F-IF 1, F-IF 2, F-IF 4, F-IF 7b, F-IF 9</p>		
<b>Unit Strands &amp; Concepts</b>	Relations and Functions, Function Notation and Evaluating Functions, Multiple Representations and Applications of Functions		
<b>Key Vocabulary</b>	<p>Dependent Variable, Domain, Function, Function Notation, Independent Variable, Input, Linear Function</p> <p>Mapping Diagram, Non-linear Function, Ordered Pair, Output, Range, Relation, Vertical Line Test</p>		



<b>Unit Title</b>	Functions	<b>Length of Unit</b>	3-5 weeks
<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>that a function is a relation in which every input value maps to exactly one output value.</li> <li>and be able to define the domain and range of a function.</li> <li>Any situation that has a constant rate of change can be represented with a linear function.</li> <li>Linear functions may be represented by equations (standard form, slope-intercept form, and point-slope form), graphs, tables and words In real-world applications, the y-intercept is the starting point and the slope is the rate of change.</li> </ul>	<ul style="list-style-type: none"> <li>determine if a relation is a function given a mapping diagram, table, graph (VLT), equation, and real world situations.</li> <li>use function notation to input values.</li> <li>analyze real life situations by stating the domain and range, writing equations, and graphing.</li> <li>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*</li> <li>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*</li> <li>Graph linear ...functions and show intercepts..</li> <li>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</li> <li>Distinguish between situations that can be modeled with linear functions [and with exponential functions].</li> <li>Prove that linear functions grow by equal differences over equal intervals... over equal intervals.</li> <li>Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</li> <li>Construct linear ... functions, including arithmetic ... sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</li> <li>Interpret the parameters in a linear ... function in terms of a context.</li> </ul>		
<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.		
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Littell, 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>	Linear Functions	<b>Length of Unit</b>	4-5 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What is a linear function?</li> <li>• What are the different ways that linear functions may be represented?</li> <li>• What is the significance of a linear function's slope and y-intercept?</li> <li>• How may linear functions model real world situations?</li> <li>• How may linear functions help us analyze real world situations and solve practical problems?</li> </ul>
<b>Standards</b>	<p><b>Interpreting Functions:</b> F-IF 6, F-IF 7, F-IF 8</p> <p><b>Linear, Quadratic, and Exponential Models:</b> F-LE 1, F-LE 2, F-LE 5</p>
<b>Unit Strands &amp; Concepts</b>	Linear Functions, Recognizing Linear Functions from Words, Tables and Graphs, Calculating and Interpreting Slope, Effects of Changing Parameters of an Equation in Slope-Intercept Form, Forms of Linear Equation, Point-Slope Form of Linear Equations
<b>Key Vocabulary</b>	Direct Variation, Linear Function, Nonlinear Function, Piecewise Function, Point-Slope Form, Rate of Change, Slope, Slope-Intercept Form, Standard Form

<b>Unit Title</b>	Linear Functions	<b>Length of Unit</b>	4-5 weeks
<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>Any situation that has a constant rate of change can be represented with a linear function.</li> <li>Linear functions may be represented by equations (standard form, slope-intercept form, and point-slope form), graphs, tables and words</li> <li>In real-world applications, the y-intercept is the starting point and the slope is the rate of change.</li> </ul>		<ul style="list-style-type: none"> <li>write and graph linear functions from tables, graphs, and verbal models.</li> <li>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*</li> <li>Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*</li> <li>Graph linear ...functions and show intercepts..</li> <li>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</li> <li>Distinguish between situations that can be modeled with linear functions [and with exponential functions].</li> <li>Prove that linear functions grow by equal differences over equal intervals... over equal intervals.</li> <li>Recognize situations in which one quantity changes at a constant rate per unit interval relative to another....</li> <li>Construct linear ... functions, including arithmetic ... sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).</li> <li>Interpret the parameters in a linear ... function in terms of a context.</li> </ul>	
<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.		
<b>Teacher Resources</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Littell, 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>	Scatterplots and Trend lines	<b>Length of Unit</b>	4-6 weeks
<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• How do we make predictions and informed decisions based on current numerical information?</li> <li>• What are the advantages and disadvantages of analyzing data by hand versus by using technology?</li> <li>• What is the potential impact of making a decision from data that contains one or more outliers?</li> </ul>		
<b>Unit Strands &amp; Standards</b>	<p><b>Statistics and Probability:</b> SP 1.8-SP 2, 8-SP 3</p> <p><b>Interpreting Categorical &amp; Quantitative Data:</b> S-ID 2, S-ID 3, S-ID 6, S-ID 7, S-ID 8, S-ID 9</p>		
<b>Unit Strands &amp; Concepts</b>	One Variable Data and measures of center, Introduction to Scatterplots and Trend Lines, Technology and Linear Regression, Explorations of Data Sets, Exploring the Influence of Outliers on Trend Lines, Piecewise Functions		
<b>Key Vocabulary</b>	Causation, correlation, correlation coefficient, extrapolation, histogram, interpolation, line of best fit,, linear regression, mean (average), median, measures of central tendency, Mode, outlier, piecewise function, scatter plot, trend line		

<b>Unit Title</b>	Scatterplots and Trend lines	<b>Length of Unit</b>	4-6 weeks
<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>Although scatter plots and trend lines may reveal a pattern, the relationship of the variables may indicate a correlation, but not causation.</li> <li>Technology can be used to find measures of center and create histograms.</li> <li>Technology can be used to find linear regression.</li> <li>Scatter plots and trend lines allow us to graphically represent data, observe patterns and study tendencies.</li> <li>Although scatter plots and trend lines may reveal a pattern, the relationship of the variables may indicate a correlation, but not causation.</li> <li>If data contains one or more outliers, assumptions based on the trend line might not be valid.</li> <li>How to interpolate and extrapolate data.</li> </ul>		<ul style="list-style-type: none"> <li>use technology to find linear regression and histograms</li> <li>graph Piecewise Functions in and out of context.</li> <li>Express and analyze patterns and functions (including arithmetic and geometric sequences) drawn from real-world contexts using tables, graphs, words and symbolic rules.</li> <li>Identify the independent and dependent variables and explain how they are related to the domain and range of a function describing a real-world problem.</li> <li>Develop, compare and apply functions using a variety of technologies (i.e. graphing calculators, spreadsheets, and on-line resources).</li> <li>Create graphs of functions representing real-world situations and label with appropriate axes and scales.</li> <li>Recognize and explain the meaning and practical significance of the slope and the x- and y-intercepts as they relate to a context, graph, table or equation.</li> <li>Collect real data and create meaningful graphical representations of the data with and without technology.</li> <li>Estimate strong and weak and positive and negative correlations from tables and scatter plots.</li> <li>Compare/contrast the advantages and disadvantages of analyzing data by hand versus by using technology.</li> </ul>	
<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.		
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Littell, 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>	Systems of Linear Equations	<b>Length of Unit</b>	3-4 weeks
<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What does the number of solutions (none, one or infinite) of a system of linear equations represent?</li> <li>• What are the advantages and disadvantages of solving a system of linear equations graphically versus algebraically?</li> <li>• What does the solution to a linear system represent?</li> </ul>		
<b>Standards</b>	<p><b>Creating Equations:</b> A-CED 3</p> <p><b>Reasoning with Equations and Inequalities:</b> A-REI 5, A-REI 6, A-REI 11</p>		
<b>Unit Strands &amp; Concepts</b>	Solving Systems of Linear Equations, Solving Systems of Linear Equations Using Substitution, Solving Systems of Linear Equations Using Elimination, Determining the number of solutions to a system of linear equations.		
<b>Key Vocabulary</b>	Addition Property of Equality, Breakeven Point, Elimination Method for Solving Systems of Equations, Fixed Cost, Multiplication Property of Equality Profit, Revenue, Solution of a System of Linear Equations, Substitution Method for Solving Systems, Substitution Property of Equality System of Linear Equations		

<b>Unit Title</b>	Systems of Linear Equations	<b>Length of Unit</b>	3-4 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>• Systems can be used to determine break-even points and analyze data relative to the break-even point.</li> <li>• There are three methods to solve systems and equations – one graphic and two algebraic. All methods result in the same solution but one method may be more efficient..</li> <li>• That a system of linear equations is an algebraic way to compare two equations that model a situation and find the breakeven point or choose the most efficient or economical plan.</li> <li>• How to choose the most effective method to solve any given linear system of equations.</li> </ul>	<ul style="list-style-type: none"> <li>• Solve systems algebraically by the substitution method and the elimination method.</li> <li>• Determine how many solutions a systems of linear equation has.</li> <li>• Develop, compare and apply functions using a variety of technologies (i.e. graphing calculators, spreadsheets, and on-line resources).</li> <li>• Develop and apply linear equations that model real-world situations.</li> <li>• Recognize and explain the meaning and practical significance of the slope and the x- and y-intercepts as they relate to a context, graph, table or equation.</li> <li>• Solve systems of linear equations that model real world situations using both graphical and algebraic methods.</li> <li>• Use algebraic properties, including associative, commutative and distributive, inverse and order of operations to simplify computations with real numbers and simplify expressions.</li> <li>• Recognize the most efficient method for solving a system of linear equations.</li> <li>• Algebraically check solutions to systems of linear equations.</li> </ul>

<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Litell, 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>	Exponential Functions	<b>Length of Unit</b>	3-4 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What characterizes exponential growth and decay?</li> <li>• What are real world models of exponential growth and decay?</li> <li>• How can one differentiate an exponential model from a linear model given a real world data set?</li> </ul>
<b>Standards</b>	<p><b>The Real Number System:</b> N-RN 2,</p> <p><b>Seeing Structures in Expressions:</b> A-SSE 1b, A-SSE 3c,</p> <p><b>Interpreting Functions:</b> F-IF 7, F-IF 8b,</p> <p><b>Building Functions:</b> F-BF 2,</p> <p><b>Linear, Quadratic, and Exponential Models:</b> F-LE 1a, F-LE 1c, F-LE 2, F-LE 3, F-LE 5</p>
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Laws of Exponents,</li> <li>• Exponential Growth</li> <li>• Decay</li> </ul>
<b>Key Vocabulary</b>	Exponential Function, Exponential Growth, Exponential Decay, Growth Factor, Decay Factor, Compound Interest, Asymptote, Laws of Exponents



<b>Unit Title</b>	Exponential Functions	<b>Length of Unit</b>	3-4
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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 pattern in linear functions is adding or subtracting (arithmetic sequences); the pattern in exponential functions is multiplication or division (geometric sequences).</li> <li>• The increase in a linear model is the same amount every year, while in an exponential model the increase is the same percent every year.</li> <li>• When comparing an exponential model with a linear model, the question is not <i>if</i> the exponential model will generate very large or very small outputs, but rather <i>when</i>.</li> <li>• With real data, sometimes deciding whether data is linear or non-linear is more complex than just looking at a graph, differences (<math>y_n - y_{n-1}</math>), or an r-value. With real-world data, you may have to make a judgment whether the data is linear or non-linear.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify the independent and dependent variables and explain how they are related to the domain and range of a function describing a real-world problem</li> <li>• Recognize that exponential functions represent constant multiplicative change, written symbolically as <math>y = a(b \text{ to the } x)</math>; a unit increase in the independent variable (<math>x</math>) causes the value of the dependent variable (<math>y</math>) to be multiplied by <math>b</math>; geometric sequences exponential functions.</li> <li>• Compare and contrast linear and exponential growth.</li> <li>• Develop, compare and apply functions using a variety of technologies (i.e. graphing calculators, spreadsheets, and on-line resources).</li> <li>• Represent exponential functions with tables, graphs, words and symbolic rules; translate one representation of a function into another representation.</li> <li>• Explain how changes in the parameters <math>a</math> and <math>b</math> affect the graph of an exponential function and validate the practical significance of the parameters in a real-world problem.</li> <li>• Use exponential functions to model and solve problems.</li> <li>• Identify real world examples of exponential growth and decay.</li> <li>• Perform calculations on expressions with exponents using exponent rules.</li> <li>• Evaluate exponential expressions and solve exponential equations</li> </ul>

<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Litell, 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>	Quadratic Functions	<b>Length of Unit</b>	4-6 weeks
<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• What are the similarities and difference between a linear and quadratic equation?</li> <li>• What types of real world situations are modeled by quadratic relationships?</li> <li>• What can the zeros, intercepts, vertex, maximum, minimum and other features of a quadratic function tell you about real world relationships?</li> <li>• How can we combine polynomials to form other polynomials?</li> </ul>		
<b>Standards</b>	<p><b>Expressions and Equations:</b> EE 2</p> <p><b>Reasoning with Equations and Inequalities</b> A-REI 4,</p> <p><b>Creating Equations:</b> A-CED 1, A-CED 2,</p> <p><b>Interpreting Functions:</b> F-IF4, F-IF7a, F-IF 8a,</p> <p><b>Building Functions:</b> F-BF3, A-APR 1,</p> <p><b>Seeing Structures in Expressions:</b> A-SSE 3a, A-SSE 3b</p>		
<b>Unit Strands &amp; Concepts</b>	Quadratic Relationships, Graphs of Parabolas including Transformations, Projectile Motion Problems, Operations with Polynomials		
<b>Key Vocabulary</b>	Quadratic Functions, Parabola, Standard Form, Quadratic Formula, Discriminant, Y-Intercept, X-Intercepts, Maximum/Minimum, Vertex, Line of Symmetry, Polynomial, Monomial, Binomial, Trinomial, Constant, Linear, Quadratic, Cubic, Quartic, Factoring, GCF		

<b>Unit Title</b>	Quadratic Functions	<b>Length of Unit</b>	4-6 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>• The graph of any quadratic function is a transformation of the graph of the parent quadratic function.</li> <li>• For any quadratic function in standard form, the values of a, b, and c provide key information about its graph.</li> <li>• You can factor many quadratic trinomials into products of two binomials.</li> <li>• To find the zeros of a quadratic function, you must set the equation equal to zero.</li> <li>• Projectile Motion problems can be modeled with a Quadratic Function</li> <li>• Polynomials can be added, subtracted, multiplied, and divided.</li> </ul>	<ul style="list-style-type: none"> <li>• Determine if a relationship is better modeled as a linear or quadratic.</li> <li>• Identify the values of a, b, and c for a quadratic relationship written in standard form and describe their effect on the shape of a graph.</li> <li>• Translate the graph of a parent function quadratic to graph any quadratic relationship written in vertex form.</li> <li>• Determine the maximum height of a projectile as well as the times it achieves a given height using a graphing calculator.</li> <li>• Determine the degree and number of terms of a polynomial.</li> <li>• Add, subtract, and multiply polynomials,</li> <li>• Factor a polynomial based on a GCF.</li> <li>• Factor a quadratic into two binomials.</li> </ul>

<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Litell, 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>	Simplifying Radicals	<b>Length of Unit</b>	2-3 weeks
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<b>Inquiry Questions (Engaging &amp; Debatable)</b>	<ul style="list-style-type: none"> <li>• Why do we simplify radicals?</li> <li>• How do we know if a radical is fully simplified?</li> </ul>
<b>Unit Strands &amp; Standards</b>	<b>The Real Number System:</b> HSN-RN-A 1, HSN-RN-A 2
<b>Unit Strands &amp; Concepts</b>	<ul style="list-style-type: none"> <li>• Simplifying radicals</li> <li>• Adding, subtracting, multiplying radicals</li> <li>• Higher powered radicals(<math>&gt;2</math>)</li> </ul>
<b>Key Vocabulary</b>	Radical, perfect square, like terms, radicand, operations, square root

<b>Unit Title</b>	Simplifying Roots	<b>Length of Unit</b>	2-3 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>• That a square root of a product is the product of the individual square roots.</li> <li>• The square root of a number can be thought of as a label to “combine like terms” when adding or subtracting radicals</li> <li>• Different power radicals can not be combined.</li> </ul>	<ul style="list-style-type: none"> <li>• Simplify a radical by breaking down the radicand into factors with at least one perfect square.</li> <li>• Add, subtract, and multiply radicals</li> <li>• Perform operations with some radicals of power 3 or greater.</li> </ul>

<b>Assessments:</b>	Check ins (exit cards), interims, and summative assessments.
<b>Teacher Resources:</b>	<a href="http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526">http://sde-cths Moodle.cthss.cen.ct.gov/moodle/course/view.php?id=526</a> , Algebra 1 by McDougal Litell, 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.