

Algebra 1 Scope and Sequence

Duration Fall	Duration Spring	Unit	Pacing	Standards and Power Standards	Resources	Assessments Note: All assessments will be common and are currently under development
Early September	January/ Early February	1. Representations of Functions	12– 15 days	<p>N-Q.1 N-Q.2</p> <p>A-CED.1 Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> ☐</p> <p>A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ☐</p> <p>A-CED.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i> ☐</p> <p>A-REI.10</p> <p>A-REI.11 Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find</p>	<p>Algebra Teachers' Activities kit (ATAK) 3-2 Solving 1 Step equations</p> <p>Cooperative Learning & Algebra (CL&A) 4.1.5 p.235</p> <p>CL&A 5.1.2, 5.1.3, 5.1.9 (Systems of equations)</p> <p>ATAK 3-20 Verifying solutions of systems of linear equations</p> <p>ATAK 4-14 Solving systems of equations by graphing</p> <p>ATAK 3-21 Solving systems</p>	Quiz Unit Test

			<p>successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. □</p> <p>F-IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.</p> <p>F-IF.2 F-IF.4 F-IF.5 F-IF.9</p> <p>MA.FIF-8.C Translate between different representations of functions and relations: graphs, equations point sets, and tabular.</p>	<p>of linear equations</p> <p>ATAK 3-22 Solving word problems by writing systems of equations</p> <p>Station Activities for Algebra I Reasoning with Equations and Inequalities Set 8 p. 191</p> <p>Text 3.1 Relations – focus on domain and range, example problems, inverses</p> <p>LTF – Introduction to Function Notation</p> <p>Text 3.2 Representing Functions - function notation, definition, function value, inputs, outputs, vertical line test, ignore mapping</p>	
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Late September /Early October	Late February/ Early March	2. Reasoning with Equations	12 – 15 days	<p>A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ☐</p> <p>ACED.4 F-IF.1 F-IF.2 F-IF.4 F-IF.5. F-IF.7 a, b F-IF.9 A-REI.10</p> <p>F-BF.1.a Write a function that describes a relationship between two quantities. ☐ a. Determine an explicit expression, a recursive process, or steps for calculation from a context.</p> <p>F-BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. <i>Include recognizing even and odd functions from their graphs and algebraic expressions for them.</i></p> <p>F-BF.4a F-LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals. ☐</p>	<p>Text 4.1 – Slope and rate of change</p> <p>ATAK 4-6 Finding the slope of a line</p> <p>LTF – Calculating Average Rates of Change</p> <p>Text 4.2 – Direct Variation</p> <p>ATAK 3-9 Writing and Using Direct Variations</p> <p>#Transformation of functions</p> <p>Text 4.5 – Writing Equations in Point-Slope Form</p> <p>ATAK 4-9 Writing the Equation of a line when given 2 points</p> <p>CL&A 4.1.2 Exploring Intercepts ATAK 4-7 Finding the x- and y-intercepts</p>	Quiz Unit Test
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				<p>F-LE.2 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). ☐</p> <p>F-LE.5 S-ID.7</p>	<p>Text 4.3 – Graphing in slope-intercept form</p> <p>Text 4.4 – Writing equation in Slope-intercept form</p> <p>CL&A 4.2.11 Interpret My slope and intercepts</p> <p>Station Activities for Algebra 1 Reasoning with Equations and Inequalities Set 2 p.119</p>	
Mid/Late October	Mid/Late March	3. Descriptive Statistics and Modeling Linear Data	15 - 17 days	<p>N-Q.1 N-Q.2 N-Q.3. S-ID.1 S-ID.2 S-ID.3 S-ID.4. S-ID.5. S-ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.☐</p> <p>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. <i>Emphasize linear, quadratic, and exponential models.</i> ☐☐</p>	<p>ATAK 4-11 Determining Whether data suggests a line</p> <p>Text 4.6 Statistics: Scatterplots and lines of fit</p> <p>ATAK 4-12 Finding the Equation of a line of fit</p> <p>Text 4-6 Graphing Calculator Lab:</p>	Quiz Unit Test

				<p>b. Informally assess the fit of a function by plotting and analyzing residuals. ☐</p> <p>c. Fit a linear function for a scatter plot that suggests a linear association.☐</p> <p>S-ID.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ☐</p> <p>S-ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit. ☐</p> <p>S-ID.9</p>	<p>Regression and Median-Fit lines</p> <p>#Resources for box-plots, histograms, dot-plots, measures of central tendency, outliers,</p>	
Early November October	Early April	4. Linear Inequalities	10 days	<p>A-CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. ☐</p> <p>A-REI.1 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.</p> <p>A-CED.3 A-CED.4</p> <p>A-REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</p> <p>A-REI.6 A-REI.10 A-REI.11 A-REI.12</p>	<p>Text 6.1 and 6.2 Solving 1 step inequalities</p> <p>ATAK 3-17 Solving one-step Inequalities</p> <p>Text 6.3 Solving multi-step inequalities</p> <p>ATAK 3-18 Solving multi-step inequalities</p> <p>ATAK 3-19 Writing and Solving Inequalities</p> <p>CL&A 5.2.1 Exploring solutions of inequalities</p> <p>CL&A 5.2.2 Am I A Solution?</p>	Quiz Unit Test

				F-BF.4.a	<p>Text 6.7 Graph inequalities in 2 variables</p> <p>CL&A 5.2.3 Graph my linear inequality</p> <p>Text 6.8 Graph systems of linear inequalities</p> <p>CL&A 5.2.4 Graph my system of linear inequalities</p> <p>ATAK 4-15 Solving systems of inequalities by graphing</p> <p>CL&A 5.2.5 Find my Feasible region</p> <p>Station Activities Reasoning with Equations and Inequalities Set 9 p. 204</p>	
Late November	Late April	5. Sequences and Functions	7 days	<p>F-IF.3 F-BF.1a</p> <p>F-BF.2 Write arithmetic and geometric sequences both recursively and with an explicit formula⁵⁰, use them to model situations, and translate between the two forms.²</p>	<p>Text 3.4 Arithmetic Sequences</p> <p>#Geometric Sequences</p>	Quiz Unit Test

				<p>F-LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.</p> <p>a. Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.</p> <p>c/. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</p> <p>F-LE.2 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).</p>	<p>#Fibonacci Sequence</p> <p>#Need many resources!</p>	
Early December	Early/Mid May	6. Exponential Functions	12 days	<p>A-SSE.1a</p> <p>A-SSE.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p>c. Use the properties of exponents to transform expressions for exponential functions. <i>For example the expression $1.15t$ can be rewritten as $(1.151/12)^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.</i></p> <p>N-RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5(1/3) \times 3$ to hold, so $(5^{1/3})^3$ must equal 5.</p> <p>N-RN.2</p>	<p>ATAK 5-1 Writing expressions in Exponential Form</p> <p>Text 7-1</p> <p>ATAK 5-4 Multiplying monomials</p> <p>ATAK 5-5 Finding Powers of Monomials</p> <p>ATAK 5-6 Dividing Monomials</p> <p>Text 7.6 Multiplying Polynomials</p>	Quiz Unit Test

				<p>F-IF.2 F-IF.3 F-IF.4 F-IF.5 F-IF.7e F-IF.8b</p> <p>F-IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</p> <p>F-BF.1. F-BF.2 F-BF.3 S-ID.6 a</p> <p>F-LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.☒</p> <p>a. Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals. ☒</p> <p>b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. ☒</p> <p>c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. ☒</p> <p>F-LE.2 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). ☒</p> <p>F-LE.3</p>	<p>Text 7.7 Special Products</p> <p>ATAK 5-9 Multiplying Binomials</p> <p>Station activities for Algebra 1 Seeing Structure in Expressions Set 1 & 2 p. 28 Skittles Lab</p> <p>Text 9.5 Exponential Functions</p> <p>Explore 9.6 Investigating Exponential Functions</p> <p>Text 9.6 Growth and Decay</p> <p>ATAK 9-12 Borrowing and Repaying Money (with Interest)</p> <p>ATAK 9-13 Calculating Compound Interest</p>	
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Mid December / January	Late May/June	7. Quadratic Functions	15 days	<p>F-LE.5</p> <p>A-SSE.1 a</p> <p>A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ☐</p> <p>A-REI.10 F-LE.3 F-IF.1 F-IF.2 F-IF.4 F-IF.5</p> <p>F-IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</p> <p>a. Graph linear and quadratic functions and show intercepts, maxima, and minima. ☐</p> <p>F-IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.</p> <p>F-IF.9</p> <p>F-BF.1 Write a function that describes a relationship between two quantities. ☐</p> <p>a. Determine an explicit expression, a recursive process, or steps for calculation from a context.</p> <p>b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function</p>	<p>Text 8.2 Factoring using the distributive property</p> <p>Text Explore 8.3 Factoring trinomials with Algebra tiles (or Algeblocks)</p> <p>Text 8.3-8.6 Factoring Trinomials and special quadratics</p> <p>Text 9.1 Graphing Quadratic Functions</p> <p>Extend Text 9.1 Graphing Calculator Lab: The Family of Quadratic Functions p.478</p> <p>CL&A 8.1.2 Can you define me? (Transformations) p.393</p> <p>CL&A 8.2.1 Exploring the Role of A</p> <p>CL&A 8.2.2 Exploring the Role of H</p>	Quiz Unit Test
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				<p><i>to a decaying exponential, and relate these functions to the model.</i></p> <p>F-BF.3 F-BF.4 a</p>	<p>CL&A 8.2.4 Exploring the Role of K</p> <p>CL&A 8.2.5 Graph Me (Vertex Form)</p> <p>CL&A 8.2.6 Write my Equation</p> <p>Text 9.2 Solving Quadratic Equations by Graphing (check by factoring)</p> <p>ATAK 9-1 Solving Quadratic Equations by Factoring</p> <p>Station Activities for Algebra 1 Reasoning with Equations and Inequalities Set 10 p. 221 (Square roots)</p> <p>ATAK 9-2 Solving Simple Quadratic Equations</p> <p>Text 9.3 Solving</p>	
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					<p>Quadratic Equations by Completing the Square</p> <p>ATAK 9-3 Solving a Quadratic Equation by Completing the Square</p> <p>Text 9.4 Solving Quadratic Equations by using the Quadratic Formula</p> <p>CL&A 8.3.1 Exploring the Connection: Quadratic formula and x-intercepts</p> <p>ATAK 9-4 Using the Quadratic Formula</p> <p>Station Activities for Algebra 1 Reasoning with Equations and Inequalities Set 11 p. 234 (Quad. Form.)</p> <p>Station Activities for</p>	
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					Algebra 1 Interpreting Functions Set 2 p. 271 (Graphing) CL&A 8.3.6 Applications of Quadratics Station Activities for Algebra 1 Interpreting Functions Set 3 p 285	
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