

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 1 – Linear Equations and Inequalities	<p>Chapter 3, Section 1                      Chapter 3, Section 2                      Chapter 3, Section 3                      Chapter 3, Section 4                      Chapter 3, Section 5                      Chapter 6, Section 1                      Chapter 6, Section 2                      Chapter 6, Section 3                      Chapter 6, Section 4</p>	<p><b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.</p> <p><b>A-CED.3.</b> Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</p> <p><b>A-REI.1.</b> 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><b>A-REI.3.</b> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>	<p>Equivalent                      Inverse operations                      Solution step                      Linear equations                      Properties of equality                      Ratio of a to b                      Similar triangles                      Identity                      Graph                      Equivalent inequalities                      Compound inequality</p>	20 days
		<p><b>Assessments:</b>                      Multiple Quizzes                      Final Test</p>		

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 2 – Equations of Lines	<p>Chapter 4, Section 4            Chapter 5, Section 1            Chapter 5, Section 2            Chapter 5, Section 3            Chapter 5, Section 5            Chapter 5, Section 6            Chapter 5, Section 7</p>	<p><b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.</p> <p><b>A-CED.2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A-CED.3.</b> Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</p> <p><b>A-REI.3.</b> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p><b>G-GPE.5.</b> Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.</p> <p><b>S-ID.7.</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p>	<p>Slope            Rate of change            Slope-intercept form            Point-slope form            Standard form</p>	16 days
		<p><b>Assessments:</b>            Multiple Quizzes            Final Test</p>		

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 3 – Introduction to Tables and Graphs	Chapter 1, Section 6 Chapter 2, Section 1 Chapter 4, Section 1 Chapter 4, Section 5 Chapter 5, Section 4 Chapter 11, Section 3 Chapter 6, Section 6 Chapter 6, Section 7	<p><b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.</p> <p><b>A-CED.2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A-CED.3.</b> Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</p> <p><b>S-ID.1.</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p><b>S-ID.6.</b> Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p> <p><b>S-ID.7.</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p> <p><b>S-ID.9.</b> Distinguish between correlation and causation.</p> <p><b>F-BF.4.</b> Find inverse functions.</p>	Data Bar graph Line graph Real numbers Real number line Origin Integers Graph Plotting Opposites Absolute value Coordinate plane Ordered pair x-coordinate y-coordinate Graph Scatter plot Constant of variation Direct variation Inverse variation Stem-and-leaf plot Measure of central tendency Mean Median Mode Box-and-whisker plot Quartiles Best-fitting line Positive correlation Negative correlation Relatively no correlation	16 days
		<p><b>Assessments:</b>                      Multiple Quizzes                      Final Test</p>		

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 4 – Graphing Linear Equations and Inequalities	<p>Chapter 4, Section 2            Chapter 4, Section 3            Chapter 4, Section 4            Chapter 4, Section 6            Chapter 4, Section 7            Chapter 6, Section 5            Chapter 9, Section 7</p>	<p><b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.</p> <p><b>A-CED.2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A-CED.3.</b> Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</p> <p><b>A-REI.4.</b> Solve quadratic equations in one variable.</p> <p><b>A-REI.10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p><b>A-REI.12.</b> Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</p> <p><b>F-IF.7.</b> 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><b>G-GPE.5.</b> Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</p> <p><b>S-ID.7.</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p>	<p>Solution of an equation            Graph of an equation            x-intercept            y-intercept            Slope            Rate of change            Slope-intercept form            Parallel            Perpendicular            Linear inequality            Solution            Half-planes            Quadratic inequalities</p>	17 days
		<p><b>Assessments:</b>            Multiple Quizzes            Final Test</p>		

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 5 – Introduction to Functions	<p>Chapter 1, Section 7                      Chapter 3, Section 7                      Chapter 4, Section 8                      Chapter 8, Section 5                      Chapter 8, Section 6                      Chapter 9, Section 3                      Chapter 11, Section 8                      Chapter 12, Section 1</p>	<p><b>A-SSE.3.</b> Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.  <b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.  <b>A-CED.3.</b> Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.  <b>A-CED.4.</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.  <b>A-REL.10.</b> Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve.  <b>F-IF.1.</b> Understand that a function from one set to another set assigns to each element of the domain exactly one element of the range.  <b>F-IF.2.</b> Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.  <b>F-IF.4.</b> For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.  <b>F-IF.5.</b> Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.  <b>F-IF.6.</b> Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a graph.  <b>F-IF.7.</b> Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.  <b>F-IF.8.</b> Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.  <b>F-IF.9.</b> Compare properties of two functions each represented in a different way.  <b>F-BF.3.</b> Identify the effect on the graph of replacing <math>f(x)</math> by <math>f(x) + k</math>, <math>k f(x)</math>, <math>f(kx)</math>, and <math>f(x + k)</math> for specific values of <math>k</math> (both positive and negative); find the value of <math>k</math> given the graphs.  <b>F-LE.1.</b> Distinguish between situations that can be modeled with linear functions and with exponential functions.  <b>F-LE.2.</b> Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs.  <b>F-LE.3.</b> Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or as a polynomial function.  <b>F-LE.5.</b> Interpret the parameters in a linear or exponential function in terms of a context.</p> <p><b>Assessments:</b>                      Multiple Quizzes                      Final Test</p>	<p>Function                      Input                      Output                      Input-output table                      Domain                      Range                      Formula                      Relation                      Function notation                      Graph of a function                      Exponential growth                      Exponential decay                      Quadratic function                      Standard form                      Parabola                      Vertex                      Axis of symmetry                      Rational equation                      Rational function                      Hyperbola                      Center                      Asymptote                      Square root function</p>	18 days

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 6 – Systems of Equations	<p>Chapter 7, Section 1 Chapter 7, Section 2 Chapter 7, Section 3 Chapter 7, Section 4 Chapter 7, Section 5 Chapter 7, Section 6</p>	<p><b>A-CED.2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p><b>A-CED.3.</b> Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.</p> <p><b>A-REI.5.</b> 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><b>A-REI.6.</b> Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</p> <p><b>A-REI.11.</b> Explain why the <math>x</math>-coordinates of the points where the graphs of the equations <math>y = f(x)</math> and <math>y = g(x)</math> intersect are the solutions of the equation <math>f(x) = g(x)</math>; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where <math>f(x)</math> and/or <math>g(x)</math> are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</p> <p><b>A-REI.12.</b> Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</p>	<p>System of linear equations Linear system. Solution of a system of linear equations Linear combination System of linear inequalities Solution Graph</p>	19 days
		<p><b>Assessments:</b> Multiple Quizzes Final Test</p>		

# Algebra I – Grade 9

Algebra I – Grade 9			
	Units	Common Core Standards	Vocabulary
Unit 7 – Exponents and Polynomials	Chapter 8, Section 1 Chapter 8, Section 2 Chapter 8, Section 3 Chapter 10, Section 1 Chapter 10, Section 2 Chapter 10, Section 3 Chapter 10, Section 4 Chapter 11, Section 7	<p><b>A-SSE.1.</b> Interpret expressions that represent a quantity in terms of its context.</p> <p><b>A-SSE.2.</b> Use the structure of an expression to identify ways to rewrite it.</p> <p><b>A-SSE.3.</b> Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p><b>A-APR.1.</b> Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</p> <p><b>A-APR.3.</b> Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.</p> <p><b>A-APR.4.</b> Prove polynomial identities and use them to describe numerical relationships.</p> <p><b>F-IF.8.</b> Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p>	Exponential function Polynomial Standard form Degree Degree of a polynomial Leading coefficient Monomial Binomial Trinomial FOIL Factored form Zero-product property Polynomial long division
		<p><b>Assessments:</b>                      Multiple Quizzes                      Final Test</p>	19 days

# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 8 – Quadratic Equations	<p>Chapter 9, Section 1 Chapter 9, Section 4 Chapter 9, Section 5 Chapter 10, Section 5 Chapter 10, Section 6 Chapter 10, Section 7 Chapter 10, Section 8 Chapter 12, Section 4</p>	<p><b>N-CN.7.</b> Solve quadratic equations with real coefficients that have complex solutions.  <b>N-CN.8.</b> (+) Extend polynomial identities to the complex numbers.  <b>N-CN.9.</b> (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.  <b>A-SSE.2.</b> Use the structure of an expression to identify ways to rewrite it.  <b>A-SSE.3.</b> Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.  <b>A-APR.4.</b> Prove polynomial identities and use them to describe numerical relationships.  <b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.  <b>A-CED.2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  <b>A-REI.4.</b> Solve quadratic equations in one variable.  <b>A-CED.1.</b> Create equations and inequalities in one variable and use them to solve problems.  <b>A-CED.2.</b> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  <b>A-REI.4.</b> Solve quadratic equations in one variable.  <b>F-IF.8.</b> Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p><b>Assessments:</b> Multiple Quizzes Final Test</p>	<p>Square root Positive square root Negative square root Radicand Perfect squares Irrational number Radical expression Quadratic equation Standard form Leading coefficient Roots Quadratic formula Factor Prime Factor completely</p>	24 days



# Algebra I – Grade 9

Units		Common Core Standards	Vocabulary	Pacing
Unit 9 – Radicals and Rational Numbers	Chapter 9, Section 2 Chapter 12, Section 2 Chapter 12, Section 3 Chapter 11, Section 4 Chapter 11, Section 5 Chapter 11, Section 6	<p><b>N-RN.1.</b> 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.</p> <p><b>N-RN.2.</b> Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p> <p><b>N-RN.3.</b> Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.</p> <p><b>A-REI.2.</b> Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</p> <p><b>F-BF.4.</b> Find inverse functions.</p>	Simplest form Conjugates Rational number Rational expression Simplified Geometric probability Least common denominator	14 days
		<p><b>Assessments:</b>                      Multiple Quizzes                      Final Test</p>		

# Algebra I – Grade 9

Units	Common Core Standards	Vocabulary	Pacing
	<b>Assessments:</b> Multiple Quizzes Final Test		

