

First Nine Weeks

Grade: 9

Subject: Algebra I

Year: IN PROGRESS 2017-2018

# Day s	SO L	Student Essential Knowledge and Skills	Resources	Vocabula ry	Bloom' s
2		<p>Teacher/Algebra Introductions Students and teachers will become acquainted with their class and the material.</p>	<p>Textbook, Workbooks, www.ixl.com , www.tenmarks.com , www.mangahigh.com http://teachers.henrico.k12.va.us/math/hcpsalgebra1/ www.skillsusa.com , Versatiles, webquest, Texas Instrument Website, www.brainpop.com , www.emediava.com , www.quizstar.4teachers.org , www.adaptivemind.com quizlet.com, edmodo.com, remind101.com, Poquoson.com, smartexchange.com, purplemath.com, internet4classrooms.com, mathstar.lacoe.edu</p>		<p>Become acquainted – L1</p>
9		<p>Calculator Activities Students will become familiar with their calculators and all of the various functions available.</p>	<p>TI-83 Scientific Calculator</p>	<p>Domain, Range, Coordinates, Axis, Radicals, Square Root, Cube Root, Operations, Absolute Value (Algebra intro terms)</p>	<p>Become acquainted – L1</p>
1	A. 1- 11	<p>ARDT Pretest</p>			

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5	<ul style="list-style-type: none"> The student will represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables. (A.1) 	<p><u>Expressions & Evaluating Expressions</u></p> <ul style="list-style-type: none"> Translate verbal quantitative situations into algebraic expressions and vice versa. Model real-world situations with algebraic expressions in a variety of representations (concrete, pictorial, symbolic, verbal). Evaluate algebraic expressions for a given replacement set to include rational numbers. Evaluate expressions that contain absolute value, square roots, and cube roots. 	Textbook Ch.1 p. 4	Quantity, Variable, Algebraic Expression, Numerical expression, Power	Represent – L2 Evaluate – L5 Translate – L2 Model – L3
4	<p>The student will solve multistep linear and quadratic equations in two variables, including</p> <ul style="list-style-type: none"> solving literal equations (formulas) for a given variable; (a.4a) justifying steps used in simplifying expressions and solving equations, using field properties and axioms of 	<p><u>Solving 1-Variable & Literal Equations</u></p> <ul style="list-style-type: none"> Solve a literal equation (formula) for a specified variable. Simplify expressions and solve equations, using the field properties of the real numbers and properties of equality to justify simplification and solution. Solve multistep linear equations in one variable. Confirm algebraic solutions to linear and quadratic equations, using a graphing calculator. 	Textbook Ch. 2 p. 77	Opposites, Additive Inverse, Multiplicative Inverse, Reciprocal, Distributive Property, Term, Constant, Coefficient, Like Terms, Solution of an Equation, Identity	Solve – L3 Justifying – L5 Simplify – L3 Confirm – L3

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	<p>equality that are valid for the set of real numbers and its subsets; (A.4b)</p> <ul style="list-style-type: none"> solving multistep linear equations algebraically and graphically; (A.4d) 				
10	<ul style="list-style-type: none"> solving literal equations (formulas) for a given variable(4a) justifying steps used in simplifying expressions and solving equations, using field properties and axioms of equality that are valid for the set of real numbers and subsets; (4b) solving multistep linear equations algebraically and graphically; (4d) solving real-world problems involving equations and systems of equations. (4f) <p>Graphing calculators will be used both as a primary tool in solving problems and to verify algebraic solutions.</p>	<p>Solving 2-Variable & Literal Equations</p> <ul style="list-style-type: none"> Solve a literal equation (formula) for a specified variable. Simplify expressions and solve equations, using the field properties of the real numbers and properties of equality to justify simplification and solution. Solve multistep linear equations in one variable. Confirm algebraic solutions to linear and quadratic equations, using a graphing calculator. Write a system of two linear equations that models a real-world situation. Interpret and determine the reasonableness of the algebraic or graphical solution of a system of two linear equations that models a real-world situation. 	Textbook Ch. 2 p. 77		<p>Solving – L3 Justifying – L5 Used – L3 Verify – L4 Simplify – L3 Confirm – L3 Write – L6 Interpret – L4 Determine – L3</p>

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9	<p>The student will solve multistep linear inequalities in two variables, including</p> <ul style="list-style-type: none"> • solving multistep linear inequalities algebraically and graphically; (A.5a) • justifying steps used in solving inequalities, using axioms of inequality and properties of order that are valid for the set of real numbers and its subsets; (A.5b) • solving real-world problems involving inequalities; and (A.5c) 	<p><u>Inequalities</u></p> <ul style="list-style-type: none"> • Solve multistep linear inequalities in one variable. • Justify steps used in solving inequalities, using axioms of inequality and properties of order that are valid for the set of real numbers. • Solve real-world problems involving inequalities. 	Textbook Ch. 3 p. 161	Equivalent inequalities, Linear Inequality, Solution of Inequality	Solve -L3 Justifying -L5
1		<p>CIP Benchmark 1 (end of first nine weeks)</p> <p>Covers:</p> <ul style="list-style-type: none"> - A.1 - A.4 A, B, D - A.5 A, B, C 			

Second Nine Weeks

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
4	<p>The student will investigate and analyze function (linear and quadratic) families and their characteristics both algebraically and graphically, including</p> <ul style="list-style-type: none"> domain/ range; (A.7b) x- and y- intercepts; (7d) 	<p>Introduction to Coordinate Plane</p> <ul style="list-style-type: none"> Identify the domain, range, and intercepts of a function presented algebraically or graphically. 		<p>Domain, Range, Relation, X-Intercept, Y-Intercept, Coordinate points, Coordinate Plane, X-Axis, Y-Axis, Zeros, Roots, Solutions</p>	<p>Investigate – L4 Analyze – L4 Identify- L2</p>
9	<p>The student will graph linear equations and linear inequalities in two variables, including</p> <ul style="list-style-type: none"> determining the slope of a line when given an equation of the line, the graph of the line, or two points on the line. Slope will be described as rate of change and will be positive, negative, zero, or undefined; and (A.6a) writing the equation of a 	<p>Slope</p> <ul style="list-style-type: none"> Graph linear equations and inequalities in two variables, including those that arise from a variety of real-world situations. Use the parent function $y = x$ and describe transformations defined by changes in the slope or y-intercept. Find the slope of the line, given the equation of a linear function. Find the slope of a line, given the coordinates of two points on the line. Find the slope of a line, given the graph of a line. Recognize and describe a line with a slope that is positive, negative, zero, or undefined. 	<p>Textbook Ch. 5 p. 291</p>	<p>Rate of Change, Slope, Parent function, Linear Parent Function, Linear Equation, Y-Intercept, Slope Intercept Form, Standard Form, Parallel Lines, Perpendicular Lines, Opposite Reciprocals</p>	<p>Graph – L3 Determining- L3 Described- L2 Writing- L6 Use- L3 Find- L3 Recognize- L1 Investigate- L4</p>

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	line when given the graph of the line, two points on the line, or the slope and a point on the line. (A.6b)	<ul style="list-style-type: none"> Use transformational graphing to investigate effects of changes in equation parameters on the graph of the equation. Write an equation of a line when given the graph of a line. Write an equation of a line when given two points on the line whose coordinates are integers. Write an equation of a line when given the slope and a point on the line whose coordinates are integers. Write an equation of a vertical line as $x = a$. Write the equation of a horizontal line as $y = c$. 			
5	<p>The student will investigate and analyze function (linear and quadratic) families and their characteristics both algebraically and graphically, including</p> <ul style="list-style-type: none"> determining whether a relation is a function; (A.7a) domain and range; (A.7b) 	<p>Graphing Functions</p> <ul style="list-style-type: none"> Determine whether a relation, represented by a set of ordered pairs, a table, or a graph is a function. Identify the domain, range, and intercepts of a function presented algebraically or graphically. For each x in the domain of f, find $f(x)$. Represent relations and functions using concrete, verbal, numeric, graphic, and algebraic forms. Given one representation, students will be able to represent the relation in another form. 	Textbook Ch. 5 p. 291	Dependent Variable, Independent Variable, Input, Output, Function, Linear Function, Nonlinear Function, Continuous Graph, Discrete Graph, Relation, Domain, Range, Vertical Line Test, Function Notation	Investigate -L4 Analyze - L4 Determining -L3 Finding - L3 Identify - L2 Represent - L2 Making Connections -L6 Detect - L3

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	<ul style="list-style-type: none"> x- and y intercepts;(A.7d) finding the values of a function for elements in its domain; (A.7e) make connections between/ among multiple representations of functions including concrete, verbal, numeric, graphic, and algebraic(A.7f) 	<ul style="list-style-type: none"> Detect patterns in data and represent arithmetic and geometric patterns algebraically. 			
4	<ul style="list-style-type: none"> solving systems of two linear equations in two variables algebraically and graphically; (A.4e) solving real-world problems involving equations and systems of equations. (A.4f) <p>Graphing calculators will be used both as a primary tool in solving problems and to verify algebraic solutions.</p>	<p><u>Systems of Equations</u></p> <ul style="list-style-type: none"> Confirm algebraic solutions to linear and quadratic equations, using a graphing calculator. Given a system of two linear equations in two variables that has a unique solution, solve the system by substitution or elimination to find the ordered pair which satisfies both equations. Given a system of two linear equations in two variables that has a unique solution, solve the system graphically by identifying the point of intersection. Determine whether a system of two linear equations has one solution, no solution, or infinite solutions. Write a system of two linear equations that models a real-world situation. 	Textbook Ch. 6 p. 357	Equivalent Equations, Addition Property of Equality, Subtraction Property of Equality, Isolate, Inverse Operations, Multiplication Property of Equality, Division Property of Equality, System of Linear Equation, Solution of Linear Equation, Consistent, Inconsistent, Independent, Dependent, Substitution, Elimination, Zero Product Property	<ul style="list-style-type: none"> Solving- L3 Used- L3 Verify- L4 Confirm- L3 Determine- L3 Write- L6 Interpret- L4

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
		<ul style="list-style-type: none"> • Interpret and determine the reasonableness of the algebraic or graphical solution of a system of two linear equations that models a real-world situation. • Determine if a linear equation in one variable has one, an infinite number, or no solutions. 			
7	The student will solve multistep linear inequalities in two variables, including <ul style="list-style-type: none"> • solving systems of inequalities. (A.5d) 	Systems of Inequalities <ul style="list-style-type: none"> • Solve systems of linear inequalities algebraically and graphically. 	Textbook Ch. 6 p. 396	System of Linear Inequality, Solution of Inequality	Solve - L3
1		<p style="text-align: center;">CIP Benchmark 2 (end of second nine weeks)</p> <p>Covers:</p> <ul style="list-style-type: none"> - A.4 E - A.5 D - A.6 A, B - A.7 A, B, D, E 			

Third Nine Weeks

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
5	The student will perform operations on polynomials, including <ul style="list-style-type: none"> • applying laws of exponents 	Exponents – Multiplying, Powers, & Dividing <ul style="list-style-type: none"> • Simplify monomial expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents. 	Textbook Ch. 7 p. 411	Exponent, Base, Simplify, Evaluate, Scientific Notation	Perform –L3 Applying – L3 Simplify –L3

	to perform operations on expressions; (A.2a)				
5	The student will perform operations on polynomials, including <ul style="list-style-type: none"> applying laws of exponents to perform operations on expressions; (A.2a) 	Exponents – Negative Exponents <ul style="list-style-type: none"> Simplify monomial expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents. 	Textbook Ch. 7 p. 411	Exponent, Base, Simplify, Evaluate, Scientific Notation	Perform –L3 Applying – L3 Simplify –L3
10	<ul style="list-style-type: none"> adding, subtracting, multiplying, and dividing polynomials; (A.2b) 	Polynomials <ul style="list-style-type: none"> Model sums, differences, products, and quotients of polynomials with concrete objects and their related pictorial representations. Relate concrete and pictorial manipulations that model polynomial operations to their corresponding symbolic representations. Find sums and differences of polynomials. Find products of polynomials. The factors will have no more than five total terms (i.e. $(4x+2)(3x+5)$ represents four terms and $(x+1)(2x^2+x+3)$ represents five terms) 	Textbook Ch. 8 p. 471	Monomial, Degree of a Monomial, Polynomial, Standard Form of a Polynomial, Degree of a Polynomial, Binomial, Trinomial,	

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
		<ul style="list-style-type: none"> Find the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor. 			

9	<ul style="list-style-type: none"> • Factoring completely first- and second-degree binomials and trinomials in one or two variables. Graphing calculators will be used as a tool for factoring and for confirming algebraic factorizations. (A.2c) • solving quadratic equations algebraically and graphically; (A.4c) <p>The student will investigate and analyze function (linear and quadratic) families and their characteristics both algebraically and graphically, including</p> <ul style="list-style-type: none"> • zeros of a function; (A.7c) 	<p>Quadratic Equations</p> <ul style="list-style-type: none"> • Factor completely first- and second-degree polynomials with integral coefficients. • Identify prime polynomials. • Use the x-intercepts from the graphical representation of the polynomial to determine and confirm its factors. • Solve quadratic equations. • Identify the roots or zeros of a quadratic function over the real number system as the solution(s) to the quadratic equation that is formed by setting the given quadratic expression equal to zero. • Confirm algebraic solutions to linear and quadratic equations, using a graphing calculator. • Identify the zeros of a function presented algebraically or graphically. 	Textbook Ch. 9 p. 531	Factoring by Grouping, Factors	Factoring- L3 Confirming- L3 Solving- L3 Investigate- L4 Analyze- L4 Identify- L2 Use- L3 Determine- L3
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8	<ul style="list-style-type: none"> The student, given a situation in a real-world context, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically. (A.8) 	<p><u>Direct & Inverse Variation</u></p> <ul style="list-style-type: none"> Given a situation, including a real-world situation, determine whether a direct variation exists. Given a situation, including a real-world situation, determine whether an inverse variation exists. Write an equation for a direct variation, given a set of data. Write an equation for an inverse variation, given a set of data. Graph an equation representing a direct variation, given a set of data. 	Textbook Ch. 11 p. 651	Direct Variation, Constant of Variation	Analyze - L4 Represent - L2 Determine - L3 Write - L6 Graph - L3
1		<p align="center">CIP Benchmark 3 (end of third nine weeks)</p> <p>Covers:</p> <ul style="list-style-type: none"> - A.2 A, B, C - A.4 C - A.7 C - A.8 			

Fourth Nine Weeks

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
5	<ul style="list-style-type: none"> The student will express square roots and cube roots of whole numbers and square root of a monomial algebraic expression in simplest radical form. (A.3) 	<p>Radicals</p> <ul style="list-style-type: none"> Express square roots of a whole number in simplest form. Express the cube root of a whole number in simplest form. Express the principal square root of a monomial algebraic expression in simplest form where variables are assumed to have positive values. 	Textbook Ch. 10 p. 597	Square Root, Cube Roots, Radical, Radicand, Perfect Square	Express – L2
8	<ul style="list-style-type: none"> The student will compare and contrast multiple univariate data sets, using box-and-whisker plots. (A.10) 	<p>Box & Whisker Plots</p> <ul style="list-style-type: none"> Compare, contrast, and analyze data, including data from real-world situations displayed in box-and-whisker plots. 	Textbook Ch. 12 p. 734	Quartile, Interquartile Range, Box and Whisker Plot, Percentile, Percentile Rank, Median	Compare - L4 Contrast - L4 Analyze – L4
10	<ul style="list-style-type: none"> The student, given a set of data, will interpret variation in real-world contexts and calculate and interpret mean absolute deviation, standard deviation, and z-scores. (A.9) 	<p>Standard Deviation & Z-Score</p> <ul style="list-style-type: none"> Analyze descriptive statistics to determine the implications for the real-world situations from which the data derive. Given data, including data in a real-world context, calculate and interpret the mean absolute deviation of a data set. Given data, including data in a real-world context, calculate variance and standard deviation of a data set and interpret the standard deviation. Given data, including data in a real-world context, calculate and interpret z-scores for a data set. 	Textbook p. 733	Mean, Element, Standard Deviation, Z-Score, Mean Absolute Deviation	Compare - L4 Contrast - L4 Analyze – L4 Determine - L3 Calculate - L3 Explain - L2 Examine - L4

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		<ul style="list-style-type: none"> • Explain ways in which standard deviation addresses dispersion by examining the formula for standard deviation. • Compare and contrast mean absolute deviation and standard deviation in a real-world context. 			
9	<ul style="list-style-type: none"> • The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions. (A.11) 	<p>Line of Best Fit</p> <ul style="list-style-type: none"> • Write an equation for a curve of best fit, given a set of no more than twenty data points in a table, a graph, or real-world situation. • Make predictions about unknown outcomes, using the equation of the curve of best fit. • Design experiments and collect data to address specific, real-world questions. • Evaluate the reasonableness of a mathematical model of a real-world situation. 	Textbook Ch. 5 p. 333	Scatter Plot, Positive Correlation, Negative Correlation, No Correlation, Trend Line, Line of Best Fit, Curve of Best Fit, Correlation Coefficient, Causation	Collect - L3 Analyze - L4 Determine - L3 Solve - L3 Using - L3 Write - L6 Make Predictions - L6 Design - L6 Evaluate - L5
		SOL Review and SOL Test			