

**Union County Educational Services Commission
High School Course Syllabus**

Title: Algebra I

Timeline: Full Year; 5 Credits

Course Description:

Students taking Algebra I will focus on learning the basics of Algebra while expressing that knowledge both verbally and through written expressions. They will learn the basic operations working with expressions, as well as how to write algebraic expressions with verbal descriptions. Students will also become familiar with linear equations, learning how to create them, graph them and interpret them. Students will graph and solve both equalities and inequalities. Students will be exposed to different classifications of polynomial expressions and basic computation with polynomials.

Scope and Sequence:

- I. Basic Concepts & Simplifying Expressions; Solving Equations
- II. Linear Equations; Solving Inequalities and Absolute Value
- III. Solving Systems of Equations and Inequalities
- IV. Law of Exponents

Refer to the attached curriculum map for a detailed outline of course objectives.

Curriculum Alignment:

New Jersey Student Learning Standards – Mathematics

Grading Procedures:

Do Now	10%
Participation	20%
Class Assignments	50%
Assessments	20%

Adoption Date:

June 2024

**Union County Educational Services Commission
Curriculum Mapping – Algebra I**

	UNIT 1		UNIT 2		UNIT 3	Unit 4
Topics	Basic Concepts & Simplifying Expressions	Solving Equations	Linear Equations	Solving Inequalities and Absolute Value	Solving Systems of Equations and Inequalities	Law of Exponents
Length of Unit	8-10 weeks		10-12 weeks		8-10 weeks	6-8 weeks
Essential Questions	How can you use simple equations to solve real-life problems?					How do you write general rules involving properties of exponents?
Target Standards	<p>A.ARP.A.1 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>N.RN.A.1 Explain how the definition of the rational</p>	<p>A.CED.A.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.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning</p>	<p>A.CED.A.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.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate</p>	<p>A.REI.D.10 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>A.CED.A.3 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>A.REI.C.5 Prove that, given a system of two equations in two variables, replacing one</p>	<p>A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it.</p> <p>N.RN.A.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.</p>

	<p>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>N.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p> <p>N.RN.B.3 Simplify radicals, including algebraic radicals.</p>	<p>as in solving equations.</p> <p>A.REI.A.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.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</p>	<p>plane, often forming a curve (which could be a line).</p> <p>A.REI.D.12 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>equation by the sum of that equation and a multiple of the other produces a system with the same solutions.</p> <p>A.REI.C.6 Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables.</p> <p>A.REI.D.10 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>N.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>
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		A.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.				
Standards for Mathematical Practice	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments & critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Express regularity in repeated reasoning.</p>					
Content or Skills	Number Lines Real Numbers Divisibility Rules Prime/Composite #s	Inverse operations - one-step - multi-step - distributive prop.	Coordinate System - Graph by Plotting Points - Graph Using Intercepts	Graphing and Writing Inequalities Solving One-Step Inequalities	Solving a System of Linear Equations (graphically) Solving a System of Linear	- Integer Exponents - Multiplying Monomials - Multiplication Property (Product

	<ul style="list-style-type: none"> - Add/Subt. Real #s - Mult/Div. Real #s Order of Operations Exponents/Radicals - Reduce - Add/Subtract - Multiply - Divide Absolute Value Simplifying Expressions 	<ul style="list-style-type: none"> - Variables on Both Sides - No & Infinite Soln. - Evaluate (plug-in given values) Literal Equations - $D=rt$ - $SI=prt$ - Geometric Formulas - Solution Mixture - Word Problems Involving Linear Equations Translating English to Algebra Writing Equations (creating variables for unknowns) Solving word problems Solving Problems Using Formulas Literal Equations (solve for different Variables) 	<ul style="list-style-type: none"> -Slope Rise over run - Graph Using the y-intercept and Slope - Finding Linear Equations - Parallel and Perpendicular Lines - Introduction to Functions - Linear Inequalities (Two Variables) Graph points Functions $f(x)$ - input and output - graph points - make a table of values - graph line from the table - graph from $y=mx+b$ - change standard to slope-intercept form 	<ul style="list-style-type: none"> Solving Two-Step Inequalities Solving Multi-Step Inequalities Solving Inequalities with Variables on Both Sides Solving Compound Inequalities Compound AND (Inward) with graphing Compound OR (Outward) with graphing Graphing Linear Inequalities (Dashed/Solid/Shading) Slope intercept form Standard Form Absolute Value Equations Absolute Value Inequalities 	<ul style="list-style-type: none"> Equations (substitution) Solving a System of Linear Equations (Elimination) Solving a System of Linear Inequalities (graphically) Consistent and Inconsistent Systems Independent and Dependent Systems 	<ul style="list-style-type: none"> of Powers Property) - Multiplication Property (Power of a Power Property) - Multiplication Property (Power of a Product Property) - Dividing Monomials - Division Property (Quotient of Powers Property) -Division Property (Positive Power of a Quotient Property) -Division Property (Negative Power of a Quotient Property)
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		Distance Formula (d=rt) Simple Interest Formulas Geometric Formulas PARCC reference sheet Work-Rate & Fluid-Rate Simple Interest Mixture Solution Mixture Solving Problems Using Literal Equations	- use slope and y- int. to graph - find x & y intercepts to graph	Solve them as compound inequalities Case 1&2: (OR) vs (AND) Color Zombie Activity Interval Notation Infinity sign Color by numbers activity		
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