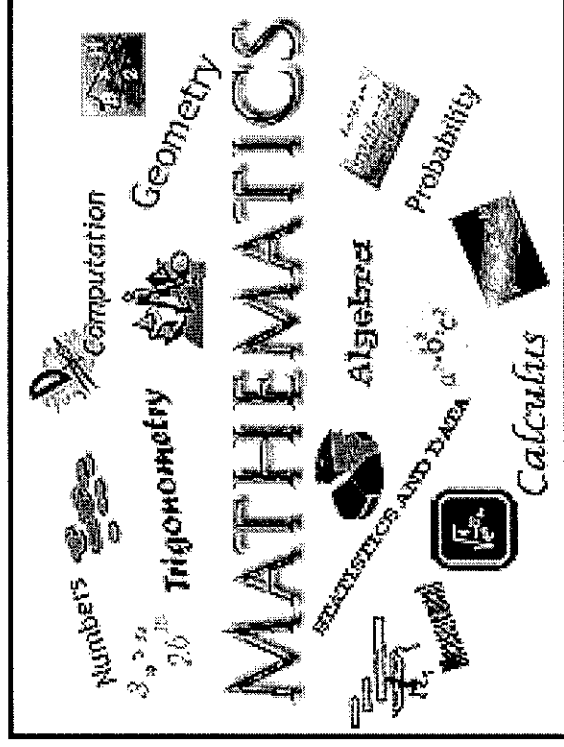


Secaucus
Board of
Education

High School Mathematics
Curriculum

Mathematics Department



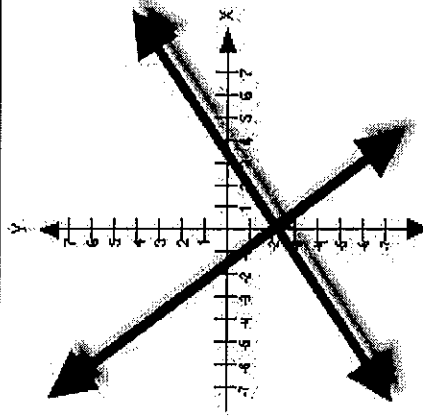
Aligned to the NJSL for Mathematics (2016), Technology (2014), & 21st Century Life and Careers (2014)

Secaucus
Board of
Education

Algebra I

Course Codes: 3120, 3130, 3800, 3805
& 6341

Mathematics Department



Born on November 2016
Aligned to the NJSL for Mathematics (2016), Technology (2014),
& 21st Century Life and Careers (2014)
Adopted by the Secaucus Board of Education on: December 22, 2016

District Equity Statement

The Board of Education directs that all students enrolled in the schools of this district shall be afforded equal educational opportunities in strict accordance with the law. No students shall be denied access to or benefit from any educational program or activity or from a co-curricular or athletic activity on the basis of the student's race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability. The Board directs the Superintendent to allocate faculty, administrators, support staff members, curriculum materials, and instructional equipment supplies among and between the schools and classes of this district in a manner that ensures equivalency of educational opportunity throughout this district. The school district's curricula in the following areas will eliminate discrimination, promote mutual acceptance and respect among students, and enable students to interact effectively with others, regardless of race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability:

1. School climate/learning environment
2. Courses of study, including Physical Education
3. Instructional materials and strategies
4. Library materials
5. Software and audio-visual materials
6. Guidance and counseling
7. Extra-curricular programs and activities
8. Testing and other assessments.

Excerpt from Secaucus Board of Education, Policy 5750, Edited September 2016.

Course Description

Algebra I provides a formal development of the algebraic skills and concepts necessary for students to succeed in advanced courses. In particular, the instructional program in this course provides for the use of algebraic skills in a wide range of problem-solving situations. The concept of a function is emphasized throughout the course. Topics covered in this course include understanding our number system, solving, graphing and writing linear equations and inequalities, exponential functions, polynomials and factoring, quadratic functions and statistics.

Primary Interdisciplinary Connections

- Finance
- Economics
- Business
- Entrepreneurial Literacy

Course Modifications (ELLs, Special Education, Gifted and Talented)

The teacher will determine, with the assistance of guidance counselors, teacher assistant/aides, educational specialists and/or special education teachers, what modifications will be made for his/her students. Such examples of modifications can include, but not be limited to:

- Extended time as needed
- Modification of tests and quizzes
- Preferential seating
- Alternative/Formative assessment (projects)
- Effective teacher questioning (ranging from simple recall to higher order critical thinking questions)
- Supplemental materials
- Cooperative learning
- Teacher tutoring
- Peer tutoring
- Differentiated Instruction

<p>Unit 1: Numbers, Operations and Expressions</p>	<p>The unit introduces the concepts of Algebra and reviews skills from the previous course (Accelerated Pre-Algebra or Introduction to Algebra).</p>	
<p>Timing:</p>	<p>1 Week</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> A-SSE.1, N-RN.3, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p>	<p>Activities, Investigation, and Student Experiences:</p>
<ul style="list-style-type: none"> • What are the basic skills needed for Algebra I? • What are the different types of numbers? • How do you add, subtract, multiply, and divide rational numbers? • What are the algebraic properties of real numbers? • How are properties of real numbers used to perform operations, classify and reason? 	<ul style="list-style-type: none"> • Students will be able to classify numbers in the real number system. • Students will be able to identify and combine like terms. • Students will be able to evaluate an expression for given values. • Students will be able to put terms in order by the degree of a variable. 	<ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending

<ul style="list-style-type: none"> • How do you use Order of Operations to calculate or simplify expressions? • How do you transform English phrases into mathematical expressions? • How can you represent quantities, patterns, and relationships? 		<p>on the topic and assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems <hr/> <ul style="list-style-type: none"> • <u>Numbers, Operations and Expressions Lab</u> <ul style="list-style-type: none"> ◦ Figure Me Out ◦ Make a Match ◦ What's My Number ◦ Snowball Fight • <u>Classifying Rational and Irrational Numbers Activity</u> • <u>Evaluating Algebraic Expression Activity</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books / Foldables • Scissors • Glue • Colored Pencils • Post-It Notes • Markers • Activity Sheets • Line Up Cards • Index Cards • Paper • Tape 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Algebra I Practice Website</u> • <u>Department Created Assessments</u> • <u>Teachers Pay Teachers - Algebra I Foldable Binder</u>

<p>Unit 2: Equations</p>	<p>The unit introduces linear equations. Students learn to solve equations starting from equations with variables on both sides and progressing to more complex equations. The unit concludes with using the skills to transform literal equations so that they are solved for a named variable.</p>	
<p>Timing:</p>	<p>2 weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> A-CED.1, A-CED.4, A-REI.1, A-REI.4, N-Q.4, F-BF.1, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How can you solve a multi-step equation? • Why do you perform operations on both sides of an equation? • How can you check the reasonableness of your solution? • Why do we use equations to solve problems? • How is thinking algebraically different from thinking arithmetically? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Distinguish between an algebraic expression and equation • Translate verbal phrases to algebraic expressions and equations • Solve equations in one variable including fractional expressions • Solve word problems requiring writing and solving equations 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems

<ul style="list-style-type: none"> • How do the properties contribute to algebraic understanding? 	<ul style="list-style-type: none"> • Solve literal equations for a given variable 	<ul style="list-style-type: none"> • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems <hr/> <ul style="list-style-type: none"> • <u>Interactive Algebra Tiles</u> • <u>Exploring Equations Further</u> • <u>Sorting Equations and Identities</u> • <u>Building and Solving Complex Equations</u>
<p>Assessments:</p>		
<ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • Card Set • TI-84+ Calculators • TI-84+ SmartView Software • Microsoft Excel Software 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Algebra I Practice</u> • <u>Department Created Assessments</u> • <u>Teachers Pay Teachers - Algebra I Foldable Binder</u>

<p>Unit 3: Graphing Linear Equations</p>	<p>The unit covers how to graph linear equations and different forms the equations can be written in. Students will also learn how write the equation of a line with given qualities. The relationships between vertical and horizontal lines will be covered.</p>	
<p>Timing:</p>	<p>4 weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> A-CED.2, A-REI.10, F.IF.7, S-ID.6, S-ID.7, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p>	<p>Activities, Investigation, and Student Experiences:</p>
<ul style="list-style-type: none"> • What are the appropriate steps in plotting points on a coordinate plane and how can we use this plot to make predictions from the information? • What are some different ways to graph linear equations? • What is meant by the slope of a line, and how can knowing a line's slope help to graph a line and find 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Graph a line using intercepts. • Graph horizontal and vertical lines. • Calculate the slope of a line when given a graph, or two points. • Describe how slope relates to horizontal and vertical lines. • Write and graph the equation of a line using point-slope form. • Write and graph the equation of a line using slope-intercept form. 	<ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on

<p>parallel and perpendicular lines?</p> <ul style="list-style-type: none"> • Why is it important to identify a graph as representing a function? • How can a graph be used to represent real-life situations? 	<ul style="list-style-type: none"> • Determine if a proportional relationship exists between sets of points. • Write and graph the equation of a line that has a proportional relationship. • Write the equation of a line based on the given information. • Solve problems using the equation of a line. • Determine whether or not a scatter plot has a linear relationship. • Draw the line of best fit to model the data in a scatter plot that has a linear relationship and use the line of best fit to solve problems. 	<p>the topic and assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebooks <hr/> <ul style="list-style-type: none"> • <u>Classifying Equations of Parallel and Perpendicular Lines</u> • <u>Increasing Portions. Expanding Waistlines Activity</u> • <u>Linear Alignment Activity</u> • <u>Proportional Relationships Lab</u> • <u>Candle Burning Lab</u> • <u>Dinner Party Graphing Calculator Activity</u> • <u>Points, Lines and Slopes (Oh My!) Graphing Calculator Activity</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • Poster boards • Chromebooks with Internet access 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Algebra I Practice</u> • <u>Department Created Assessments</u> • <u>Teachers Pay Teachers - Algebra I Foldable Binder</u>

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|--|--|--|
| | <ul style="list-style-type: none">• TI-84+ Calculators• TI-84+ SmartView Software | |
|--|--|--|

<p>Unit 4: Systems of Linear Equations</p>	<p>The unit uses graphing, elimination, and substitution to solve systems of equations. Situations will be modeled with systems and solved.</p>	
<p>Timing:</p>	<p>3 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> A-CED.2, A-REI.5, A-REI.6, A-REI.11, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p>	<p>Activities, Investigations, and Student Experiences:</p>
<ul style="list-style-type: none"> • How can real world situations be modeled by systems? • How can solutions be found to a system? • What does the number of solutions (none, one or infinite) of a system of linear equations represent? • What are the advantages and disadvantages of solving a system of linear equations graphically versus algebraically? • How can systems of 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Solve systems of linear equations using three methods: Graphing, Substitution, and Elimination. • Identify the three possible types of solutions for a system of two equations. • Write systems of equations to solve real-world problems. 	<ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems

<p>equations be used to represent situations and solve problems?</p>		<ul style="list-style-type: none"> ● Interactive Notebooks <hr/> <ul style="list-style-type: none"> ● Solving Systems of Equations Graphing Calculator Activities ● The Candy Problem ● Talk or Text Activity ● Supply and Demand Lab <ul style="list-style-type: none"> ○ Class Fundraiser ○ Game Cartridges and Silver Dollars ● Maximizing Profit Lab <ul style="list-style-type: none"> ○ Selling Boomerangs Activity
<p>Assessments:</p> <ul style="list-style-type: none"> ● Do Nows ● Student Participation ● Oral Questioning ● Exit Cards ● ActivExpression Device Results ● Homework Assignments ● Classwork ● Projects ● Unit Quizzes ● Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> ● Interactive Whiteboard ● Document Camera ● ActivExpression Devices ● TI-84+ Graphing Calculators ● TI-84+ SmartView Software ● TI-84 + Downloaded Files ● Graph Paper ● Rulers ● Composition Books ● Foldables ● Scissors ● Glue ● Colored Pencils ● Markers ● Activity Sheets 	<p>Resources:</p> <ul style="list-style-type: none"> ● NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations ● Texas Instruments Activity Central Website ● Illuminations Website ● Mathematics Assessment Project Website ● IXL Algebra I Practice ● Department Created Assessments ● Teachers Pay Teachers - Algebra I Foldable Binder

<p>Unit 5: Solving and Graphing Linear Inequalities</p>	<p>The unit builds upon the methods of solving equations and demonstrates the similarities and differences between solving equations and solving inequalities. The unit concludes with graphing linear inequalities and systems of linear inequalities in the coordinate plane.</p>	
<p>Timing:</p>	<p>1.5 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> A-CED.1, A-CED.3, A-REI.1, A-REI.3, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p>	<p>Activities, Investigation, and Student Experiences:</p>
<ul style="list-style-type: none"> ● How can related values that are not equivalent be represented? ● How do we solve for a variable in an inequality? ● How is solving an inequality similar to solving an equation? ● How is it different from solving an equation? ● How do we graph a linear inequality in the coordinate plane? ● How do we solve a system of linear inequalities? 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ● Write an inequality. ● Solve one-step inequalities. ● Solve two-step and multiple step inequalities. ● Graph a single inequality on a number line. ● Solve compound inequalities and graph them on a number line. ● Explain the difference between disjunctions and conjunctions. 	<ul style="list-style-type: none"> ● Interactive Whiteboard Presentations <ul style="list-style-type: none"> ○ Visual Representations of Concepts ○ Modeling of Examples ● Cooperative Group Investigations and Hands-on Activities ● Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems ● Partner collaboration or individual work (depending on the topic and

	<ul style="list-style-type: none"> Graph a linear inequality that contains two variables in a coordinate plane. Solve and graph a system of linear inequalities by graphing them in a coordinate plane. 	<p>assignment.)</p> <ul style="list-style-type: none"> Solving Real World Problems Interactive Notebooks <hr/> <ul style="list-style-type: none"> <u>Inequalities Bingo</u> <u>The Impossible Task</u> Calculator Activity <u>Linear Inequalities Graphing Calculator Activity</u> <u>Testing for Truth Graphing Calculator Activity</u> <u>Linear Equations in Two Variables Representing Inequalities Graphically</u>
<p>Assessments:</p> <ul style="list-style-type: none"> Do Nows Student Participation Oral Questioning Exit Cards ActivExpression Device Results Homework Assignments Classwork Projects Unit Quizzes Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> Interactive Whiteboard Document Camera ActivExpression Devices Whiteboards Dry Erase Markers Erasers Composition Books Foldables Scissors Glue Colored Pencils Activity Sheets TI-84+ Graphing Calculators TI-84+ SmartView Software TI-84 + Downloaded Files Graph Paper 	<p>Resources:</p> <ul style="list-style-type: none"> <u>NICTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> <u>Texas Instruments Activity Central Website</u> <u>Illuminations Website</u> <u>Mathematics Assessment Project Website</u> <u>IXL Algebra I Practice</u> Department Created Assessments Teachers Pay Teachers - Algebra I Foldable Binder

<p>Unit 6: Solving Absolute Value Equations & Inequalities</p>	<p>The unit reviews the inverse operations used to solve equations and inequalities. Students learn to solve absolute value equations and graph their solutions on a number line. The unit concludes with the derivation of the compound inequalities required to graph absolute value inequalities. Word problems are also solved throughout this unit.</p>	
<p>Timing:</p>	<p>1.5 weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> A-CED.1, A-CED.3, A-REI.1, A-REI.3, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> ● How do we represent unknown quantities? ● How can I solve an equation involving absolute values? ● Why is there more than one solution for an absolute value? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> ● Solve absolute value equations. ● Solve absolute value inequalities. ● Identify cases of equations and inequalities containing absolute values which have no solutions. ● Write an absolute value equation or inequality to model real-world problems. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> ● Interactive Whiteboard Presentations <ul style="list-style-type: none"> ○ Visual Representations of Concepts ○ Modeling of Examples ● Cooperative Group Investigations and Hands-on Activities ● Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems ● Partner collaboration or individual work (depending on the topic and

		assignment.) <ul style="list-style-type: none"> Solving Real World Problems Interactive Notebooks <hr/> <ul style="list-style-type: none"> <u>Can I Graph You, Too?</u> Graphing Calculator Activity <u>Absolutely!</u> Graphing Calculator Activity
Assessments: <ul style="list-style-type: none"> Do Nows Student Participation Oral Questioning Exit Cards ActivExpression Device Results Homework Assignments Classwork Projects Unit Quizzes Unit Test 	Materials: <ul style="list-style-type: none"> Interactive Whiteboard Document Camera ActivExpression Devices Whiteboards Dry Erase Markers Erasers Composition Books Foldables Scissors Glue Colored Pencils Activity Sheets TI-84+ Graphing Calculators TI-84+ SmartView Software TI-84 + Downloaded Files Graph Paper 	Resources: <ul style="list-style-type: none"> <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> <u>Texas Instruments Activity Central Website</u> <u>Illuminations Website</u> <u>Mathematics Assessment Project Website</u> <u>IXL Algebra I Practice</u> <u>Department Created Assessments</u> <u>Teachers Pay Teachers - Algebra I Foldable Binder</u>

<p>Unit 7: Relationships Between Quantities</p>	<p>This unit covers how to convert different units using conversion factors. The unit will also discuss how to pick the unit that is the most appropriate for a given situation, and what the most appropriate accuracy is for a given situation.</p>	
<p>Timing:</p>	<p>2 weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> N-Q.1, N-Q.2, N-Q.3, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How can you convert and estimate different units to solve real world problems? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Convert a unit of measurement to a different unit. • Convert rate of measurement to different rates. • Pick the appropriate type of unit for a desired measurement. • Construct a system of linear equations to model a given situation containing the same unit of measurement. • Pick the appropriate level of accuracy for a given situation. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems

		<ul style="list-style-type: none"> ● Partner collaboration or individual work (depending on the topic and assignment.) ● Solving Real World Problems ● Interactive Notebooks
<p>Assessments:</p> <ul style="list-style-type: none"> ● Do Nows ● Student Participation ● Oral Questioning ● Exit Cards ● ActivExpression Device Results ● Homework Assignments ● Classwork ● Projects ● Unit Quizzes ● Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> ● Interactive Whiteboard ● Document Camera ● ActivExpression Devices ● Whiteboards ● Dry Erase Markers ● Erasers ● Composition Books ● Foldables ● Scissors ● Glue ● Colored Pencils ● Activity Sheets 	<p>Resources:</p> <ul style="list-style-type: none"> ● <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> ● <u>Texas Instruments Activity Central Website</u> ● <u>Illuminations Website</u> ● <u>Mathematics Assessment Project Website</u> ● <u>IXL Algebra I Practice</u> ● Department Created Assessments ● Teachers Pay Teachers - Algebra I Foldable Binder

<p>Unit 8: Functions</p>	<p>The unit defines the key features of functions, and uses explicit and recursive formulas to define sequences. The unit explores and compares the multiple representations of functions and transformations of linear functions.</p>	
<p>Timing:</p>	<p>3 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> F-IF.1-3, F-IF.5, F-BF.1-3, F-LE, 2, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> ● Define a function and identify its domain and range. ● Evaluate functions. ● Write recursive and explicit formulas. ● Compare the rate of change of multiple representations of functions. ● Write a linear function after a given transformation. ● Determine the transformation(s) that occur between 2 linear functions. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> ● Interactive Whiteboard Presentations <ul style="list-style-type: none"> ○ Visual Representations of Concepts ○ Modeling of Examples ● Cooperative Group Investigations and Hands-on Activities ● Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems ● Partner collaboration or individual work (depending on the topic and
<ul style="list-style-type: none"> ● What strategies can we use to identify patterns? ● How do you use a formula to identify the terms of a sequence? ● What does a function look like? ● How can you represent and describe functions? ● What is the purpose of function notation? ● How can functions describe real-world 		

<p>situations, model predictions and solve problems?</p> <ul style="list-style-type: none"> • How can you find the domain and range of a function? • How do you know when a pattern is linear or nonlinear? • How do you write a linear function after a given transformation? 		<p>assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebooks <hr/> <ul style="list-style-type: none"> • <u>Using a Calculator for Finding the Equation of a Function</u> • <u>Investigation of Transformations with Linear Functions Lab</u> • <u>Representing Functions of Everyday Situations</u> • <u>Back in Time Graphing Calculator Activity</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • TI-84+ Graphing Calculators • TI-84+ SmartView Software • TI-84 + Downloaded Files • Poster Paper • Index Cards 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Algebra I Practice</u> • <u>Department Created Assessments</u> • <u>Teachers Pay Teachers - Algebra I Foldable Binder</u>

<p>Unit 9: Exponential Functions</p>	<p>The unit examines exponential growth and decay.</p>
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How do you use the exponent properties to simplify expressions and equations? • What are the parts of an exponential function? • What are the characteristics of exponential functions? • What characterizes exponential growth and decay? • What are real world models of exponential growth and decay? • How can one differentiate an exponential model from a linear model given a real world set of 	<p>3 weeks</p> <p><u>NJSLS for Mathematics:</u> F-IF.4-7, F-IF.9, F-BE.1, F-LE.1, F-LE.3, F-LE.5, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p> <p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify exponential relationships from fro a table, a graph, and an equation. • Calculate growth rates and factors. • Identify exponential growth and decay. • Simplify expressions using rules of exponents
<p>Standards:</p>	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems

<p>data?</p>		<ul style="list-style-type: none"> ● Interactive Notebooks ● <u>Exponent Rules</u> Graphing Calculator Activity Lab ● <u>Representing Linear and Exponential Growth</u> ● <u>ELIM&MINATION</u> Lab ● <u>More Trains</u> Activity
<p>Assessments:</p> <ul style="list-style-type: none"> ● Do Nows ● Student Participation ● Oral Questioning ● Exit Cards ● ActivExpression Device Results ● Homework Assignments ● Classwork ● Projects ● Unit Quizzes ● Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> ● Interactive Whiteboard ● Document Camera ● ActivExpression Devices ● Whiteboards ● Dry Erase Markers ● Erasers ● Composition Books ● Foldables ● Scissors ● Glue ● Colored Pencils ● Activity Sheets ● TI-84+ Graphing Calculators ● TI-84+ SmartView Software ● TI-84 + Downloaded Files ● Card Sets ● Poster Paper ● M&Ms ● Cups ● Plates ● Graph Paper ● Cuisenaire Rods or Paper Rod 	<p>Resources:</p> <ul style="list-style-type: none"> ● <u>NJCTL</u> Presentations / Teacher Created Interactive Whiteboard Presentations ● <u>Texas Instruments Activity Central</u> Website ● <u>Illuminations</u> Website ● <u>Mathematics Assessment Project</u> Website ● <u>IXL Algebra I Practice</u> ● Department Created Assessments ● Teachers Pay Teachers - Algebra I Foldable Binder

<p>Unit 10: Polynomials</p>	<p>The unit explores operations that can be done with polynomials. Students will first learn how to describe monomials and polynomials, then they will learn to add, subtract and multiply them. The unit also explores various methods of factoring.</p>
<p>Timing:</p>	<p>4 weeks</p>
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> A-SSE.2-3, A-APR.1, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p>	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Describe and identify monomials, polynomials, and degrees. • Add and subtract polynomials. • Multiply a polynomial by a monomial. • Multiply two polynomials. • Recognize and factor monomials out of a polynomial. • Factor trinomials. • Factor a polynomial with four terms using the grouping method.
<ul style="list-style-type: none"> • Why is it important to simplify and evaluate polynomial expressions? • What operation on a set of polynomials would best create a useful expression for a given situation? • What does a solution mean in terms of a given situation? • Is a solution a viable solution to a problem? • When is it necessary to use polynomials? • What is the best way to factor 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems

<p>an expression?</p> <ul style="list-style-type: none"> • Why does the degree of an equation reveal the number of solutions to the equation? 		<ul style="list-style-type: none"> • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems • Interactive Notebooks <hr/> <ul style="list-style-type: none"> • <u>Polynomial Puzzler Activity</u> • <u>Building Connections Activity</u> • <u>Generating Polynomials from Patterns</u> • <u>Representing Polynomials Graphically</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • Rulers • Poster Paper • Card Sets 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Algebra I Practice</u> • Department Created Assessments • Teachers Pay Teachers - Algebra I Foldable Binder

<p>Unit 11: Quadratic Equations</p>	<p>The unit builds on the quadratic polynomials studied in the previous unit. This unit looks at the quadratic polynomials graphically, examining the different methods to find the zeros of the graph.</p>	
<p>Timing:</p>	<p>4 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> A-SEE.1-3, A-REI.4, A-APR.3, F-IF.4, F-IF.6-8, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • Why do we analyze quadratic functions? • How does solving for x in quadratic functions compare to solving for x in linear functions? • To what extent are solutions to quadratic equations real? • How are the real solutions of a quadratic equation related to the graph of the related quadratic function? • How does understanding how to find the vertex of a quadratic function help in making decisions in real-life applications? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify the parts of quadratics. • Calculate the axis of symmetry and vertex of a quadratic function when it is in standard form. • Find the zeros of a quadratic function by graphing it in a coordinate plane. • Solve quadratic equations using the zero product property. • Solve quadratic equations and polynomials by factoring. • Solve quadratic equations using square roots. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems

<ul style="list-style-type: none"> • What are the advantages of a quadratic function in vertex form? In standard form? • How is any quadratic function related to the parent quadratic function $f(x)=x^2$? • Why is it possible for a quadratic equation to have one solution, two solutions or no solutions? • How is it possible for a quadratic equation to have two solutions, but in a real-world context only have one solution? 	<ul style="list-style-type: none"> • Solve quadratic equations by completing the square. • Identify the nature of the roots of a quadratic using the discriminant. • Solve quadratic equations using the quadratic formula. • Solve polynomial equations using u-substitution. • Solve application problems using methods for solving quadratic equations. 	<ul style="list-style-type: none"> • Interactive Notebooks <hr/> <ul style="list-style-type: none"> • Graphing Quadratic Functions • Graphing Calculator Activity • Using Symmetry to Find the Vertex of a Parabola • Graphing Calculator Activity • Bridge on the River • Quad Graphing • Calculator Activity • Quadratic Formula Graphing Calculator Activity • Representing Quadratic Functions Graphically • Solving Quadratic Equations • Egg Launch Contest • Hanging Chairs Activity
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Activity Sheets • Composition Books • Foldables • Scissors • Glue • Colored Pencils • TI-84+ Graphing Calculators • TI-84+ SmartView Software • TI-84 + Downloaded File • Domino Cards 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • Texas Instruments Activity Central Website • Illuminations Website • Mathematics Assessment Project Website • IXL Algebra I Practice • Department Created Assessments • Teachers Pay Teachers - Algebra I Foldable Binder

