Salem County Vocational and Technical School District

Algebra I Curriculum

Grades: 9-10

BOE Approved: August 2025

Mission Statement

The mission of the Salem County Vocational Technical School District is to prepare students for employment, for further education leading to employment, and for lifelong learning.

Standards and Commitments

Our schools will provide an engaging and challenging curriculum that addresses the New Jersey Student Learning Standards (NJSLS). Teaching and learning will take place in physically and emotionally safe environments that have an active commitment to ensure trust, mutual respect, communication, effective collaboration, and good citizenship. The vision of Salem County Vocational and Technical School District is that all students develop the skills, knowledge, and attitudes necessary to succeed in life.

Course Description

Algebra I strengthens students' reasoning and problem solving abilities. Topics covered in this course include working with variable expressions; solving one, two, and multi-step equations; graphing and solving linear equations and inequalities, systems of equations and inequalities and quadratic functions. There is also an introduction to the connection with algebra and geometry through topics such as ratios and proportions; scale measurements; similarity; perimeter and area formulas; and the Pythagorean Theorem. Graphing calculators are used often to aid in problem solving techniques. Students will also make use of good mathematical practices, such as making sense of problems and persevere in solving them, modeling with mathematics, attending to precision, and using appropriate tools strategically.

Unit 1 Pacing Guide- 4 days

Chapter		
Chapter 11	4 days	Data Analysis and Displays

Unit 2 Pacing Guide- 25 days

Chapter		
Chapter 1	8 days	Solving Linear Equations
Chapter 2	8 days	Solving Linear Inequalities
Chapter 3	9 days	Graphing Linear Functions

Unit 3 Pacing Guide- 24 days

Chapter		
Chapter 4	8 days	Writing Linear Functions
Chapter 5	8 days	Solving Systems of Linear Equations
Chapter 6	8 days	Exponential Functions and Sequences

Unit 4 Pacing Guide- 37 days

Chapter		
Chapter 7	12 days	Polynomial Equations and Factoring
Chapter 8	7 days	Graphing Quadratic Functions
Chapter 9	11 days	Solving Quadratic Equations
Chapter 10	7 days	Radical Functions and Equations

STANDARDS FOR MATHEMATICAL PRACTICE

SMP.1: Make sense of problems and persevere in solving them.
SMP.2: Reason abstractly and quantitatively.
SMP.3: Construct viable arguments and critique the reasoning of others.
SMP.4: Model with mathematics.
SMP.5: Use appropriate tools strategically.
SMP.6: Attend to precision.
SMP.7: Look for and make use of structure.
SMP.8: Look for and express regularity in repeated reasoning.

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Unit 1- Data Analysis

Course: Algebra 1	**Timeframe:** 4 Days

Unit 4 Focus/ Big Ideas

- To find measures of center and variation of a data set
- To make and interpret box-and-whisker plots for data sets
- To describe and compare shapes of distribution
- To use two-way tables to represent data

Unit 1 Pacing Guide- 10 days

Chapter		
Chapter 11	4 days	**Data Analysis and Displays** 11.1 Measures of Center and Variation 11.2 Box-and-Whisker Plots 11.3 Shapes of Distribution 11.4 Two-Way Tables 11.5 Two-Way Tables and Relative Frequencies 11.6 Choosing a Data Display

Unit 1 Essential Questions	**Unit 1 Enduring Understandings**
• How are dot plots, histograms, and box plots used to learn about distributions of numerical data? • How can the scatter plot, best-fit line, and correlation coefficient be used to learn about linear relationships in bivariate numerical data? • How can a two-way table be used to learn about associations between two categorical variables? • When is it reasonable to interpret associations as evidence for causation?	• Use the shape of a data distribution to select appropriate measures of central tendency and dispersion, and to account for the effects of outliers in the data. • Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population. • Statisticians use several methods to represent a set of one variable data. • Measures of center and spread can be used to understand a set of one variable data • Scatter Plots are one way to compare and find relationships between two variables.

Unit 1 NJSLS Standards

Chapter	**Standards**	
	• S.ID.A.1 • S.ID.A.2	• Represent data with plots on the real number line (dot plots, histograms, and box plots).

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Chapter 11	• S.ID.A.3 • S.ID.B.5	• Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. • Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). • Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies).

Unit 1 Instructional Plan

Unit 1 Pre-Assessment
Common Pre-assessment given prior to this unit to build a base of student understanding.

Unit 1 Evidence of Learning-Assessments	
Formative	Daily Warm-up, Daily Closure Activity, Daily Teacher Observations, Class Participation, Homework, Gimkits, Kahoots, Quizizz, Blooket, Paper Based Quiz, Academic Games, Group Work
Summative	Chapter Tests, Standards Mastery Assessments
Benchmark	MAP Test
Alternative Assessments	Career Project Math in Careers <>

Unit 1 Instructional and Supplemental Materials	
Instructional Materials	Concepts and Connections Chapter 11, Delta Math, CalcChat, Gimkit, Kahoot, Quizizz, Desmos, Edulastic, Math Medic, and Geogebra Data Lesson Plans Day 1-4
Supplemental Unit Resources	*S.ID.A.1-3 Haircut Costs* *S.ID.A.1-3 Speed Trap* *S.ID.A.2-3 Measuring Variability in a Data Set* *S.ID.A.3 Identifying Outliers* *S.ID.B.5 Support for a Longer School Day?* *S.ID.B.6 Laptop Battery Charge 2* *F.IF.B.4 The Aquarium* *F.IF.B.4 Containers* *F.IF.B.4-5 The Canoe Trip, Variation 2* LGBTQ Scientists-Engineers-Mathematicians + Mean, Median, Mode - Career Exploration <>

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	Amistad Activity * *Holocaust Commission Activities* ^
Invention Resources	Tier II-III Interventions: Concepts and Connections

Unit 1 Instructional Best Practices	
• Establish mathematic goals to focus learning • Direct Instruction • Mini Lessons • Identifying Similarities and Differences • Summarizing and Note Taking • Reinforcing Effort and Providing Recognition • Homework and Practice • Modeling • Cooperative Learning • Setting Objectives and providing Feedback • Cues, Questions, and Advance Organizers • Homework and Practice • Technology Infusion • Cooperative Learning • Checks for Understanding (Check for Understanding Strategies Description) • Closure	• Gradual Release of Responsibility • Managing response rates • Checks for understanding • Diagrams, charts and graphs • Coaching • Use and connect mathematical representations. • Visuals • Collaborative problem solving • Active engagement strategies • Establishing metacognitive reflection and articulation • Implement tasks that promote reasoning and problem solving.

Unit 1 Related Misconception(s) /Clarifications
S.ID.A.1, S.ID.A.2 & S.ID.A.3 Students may believe: That a bar graph and a histogram are the same. A bar graph is appropriate when the horizontal axis has categories and the vertical axis is labeled by either frequency (e.g., book titles on the horizontal and number of students who like the respective books on the vertical) or measurement of some numerical variable (e.g., days of the week on the horizontal and median length of root growth of radish seeds on the vertical). A histogram has units of measurement of a numerical variable on the horizontal (e.g., ages with intervals of equal length). That the lengths of the intervals of a boxplot (min,Q1), (Q1,Q2), (Q2,Q3), (Q3,max) are related to the number of subjects in each interval. Students should understand that each interval theoretically contains one-fourth of the total number of subjects. Sketching an accompanying histogram and constructing a live boxplot may help in alleviating this misconception.

That all bell-shaped curves are normal distributions. For a bell-shaped curve to be Normal, there needs to be 68% of the distribution within one standard deviation of the mean, 95% within two, and 99.7% within three standard deviations.
S.ID.B.5 & S.ID.B.6

Students may believe:

That a 45 degree line in the scatterplot of two numerical variables always indicates a slope of 1 which is the case only when the two variables have the same scaling.

That residual plots in the quantitative case should show a pattern of some sort. Just the opposite is the case.

F.IF.B.4 & F.IF.B.5

Students may believe that it is reasonable to input any *x*-value into a function, so they will need to examine multiple situations in which there are various limitations to the domains.

Students may also believe that the slope of a linear function is merely a number used to sketch the graph of the line. In reality, slopes have real-world meaning, and the idea of a rate of change is fundamental to understanding major concepts from geometry to calculus.

Unit 1 Interdisciplinary Connections

SL.PE.9-10.1.A Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
SL.PE.9-10.1.B Collaborate with peers to set rules for discussions (e.g., informal consensus, taking votes on key issues, presentation of alternate views); develop clear goals and assessment criteria (e.g., student developed rubric) and assign individual roles as needed.
RI.MF.9-10.6 Analyze, integrate, and evaluate multiple interpretations (e.g. recorded or live production of a play or recorded novel or poetry) of a single text or texts presented in different formats (visually, quantitatively).
9.4.2.IML.2: Represent data in a visual format to tell a story about the data

Unit 1 Integration of Technology

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

Academic Vocabulary			
Association	Causation	Histogram	Mean, median
Bivariate data	Correlation	Intercept	Outlier
Box plots	Correlation coefficient	Linear model	Quantitative variables
			Scatter plot

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Categorical variables	Dot plots	Line of best fit	

Unit 2- Solving Linear Equations and Linear Inequalities and Graphing Linear Functions

Course: Algebra 1	**Timeframe**: 25 Days

Unit 2 Focus/ Big Ideas

- To solve a linear equation, find the value of the variable that makes the equation true
- To solve a linear inequality, use properties similar to the ones you use to solve linear equations
- To describe characteristics of functions
- To use function notation
- To graph and interpret linear equations written in standard form

Unit 2 Pacing Guide- 25 days

Chapter		
Chapter 1	8 days	**Solving Linear Equations** 1.1 Solving Simple Equations 1.2 Solving Multi Step Equations 1.3 Proportions and Measurements 1.4 Solving Equations with Variables on both sides 1.5 Solving Absolute Value Equations 1.6 Rewriting Equations and Formulas
Chapter 2	8 days	**Solving Linear Inequalities** 2.1 Writing and Graphing Inequalities 2.2. Solving Inequalities Using Addition or Subtraction 2.3 Solving Inequalities Using Multiplication or Division 2.4 Solving Multi-Step Inequalities 2.5 Solving Compound Inequalities 2.6 Solving Absolute Value Inequalities
Chapter 3	9 days	**Graphing Linear Functions** 3.1 Functions 3.2 Characteristics of Functions 3.3 Linear Functions 3.4 Function Notation 3.5 Graphing Linear Equations in Standard Form 3.6 Graphing Linear Equations in Slope-Intercept Form 3.7 Transformations of Linear Functions (if time allows) 3.8 Graphing Absolute Value Functions (honors track)

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Unit 2 Essential Questions	Unit 2 Enduring Understandings
• How can you write and solve equations and inequalities? • How can you solve real life problems with graphs of linear equations? • How are graphs of linear inequalities helpful in solving problems? • Can solving systems of linear inequalities help businesses maximize profit and minimize cost? • How can you use an inequality to describe a real-life statement? • How do we evaluate mathematical statements? • Why do we need to justify our steps in mathematical procedures?	• Equations and inequalities can be used to solve real world applications. • Equations can be used to model real world situations. • Inequalities and equations have similarities and differences. • Patterns can help you understand mathematics and model situations. • Mathematical reasoning is evidenced by testing and evaluating statements and justifying steps in mathematical procedures. • Formulate and use different strategies to solve one-step and multi-step linear equations.

Unit 2 NJSLS Standards

Chapter	Standards	
Chapter 1	• N.Q.A.1 • N.Q.A.2 • N.Q.A.3 • A.CED.A.1 • A.CED.A.4 • A.REI.A.1. • A.REI.B.3 • A.SSE.A.1.a,b	• Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. • Define appropriate quantities for the purpose of descriptive modeling. • Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. • 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. • Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R. • 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. • Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. • Interpret parts of an expression, such as terms, factors, and coefficients. • Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r) n as the product of P and a factor not depending on P.

Chapter 2	• A.CED.A.1 • A.REI.B.3 • A.SSE.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. • Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. • Interpret parts of an expression, such as terms, factors, and coefficients. • Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r) n as the product of P and a factor not depending on P.
Chapter 3	• A.CED.A.2 • F.BF.B.3 • F.IF.A.1 • F.IF.A2 • F.IF.B.4 • F.IF.B.5 • F.IF.C.7a,b • F.IF.C.9 • F.LE.A.1a,b • F.LE.B.5	• Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales • Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx)and f(x+k) • 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 • Use function notation, evaluate functions for for inputs in their domains, and interpret statements that use function notation in terms of context • 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 • Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. • Graph linear and quadratic functions and show intercepts, maxima, and minima. • Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (If time allows) • Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). • Distinguish between situations that can be modeled with linear functions and with exponential functions. • Interpret the parameters in a linear or exponential function in terms of a context.

Unit 2 Instructional Plan

Unit 1 Pre-Assessment
Common Pre-assessment given prior to this unit to build a base of student understanding.

Unit 2 Evidence of Learning-Assessments	
Formative	Daily Warm-up, Daily Closure Activity, Daily Teacher Observations, Class Participation, Homework, Gimkits, Kahoots, Quizizz, Blooket Paper Based Quiz, Academic Games, Group Work.
Summative	Chapter Tests, Standards Mastery Assessments
Benchmark	MAP Test

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Alternative Assessments	Project Career Mini Project <>

Unit 2 Instructional and Supplemental Materials	
Instructional Materials	Concepts and Connections Chapters 1-3, Delta Math, CalcChat, Gimkit, Kahoot, Quizizz, Desmos, Edulastic, Math Medic, and Geogebra
Supplemental Unit Resources	Person Puzzle - Irena Sendler ^ *N.Q.A.1 Runners' World* *N.Q.A.2 Giving Raises* *N.Q.A.3 Calories in a Sports Drink* *A.REI.B.3, A.REI.A.1 Reasoning with linear inequalities* *A.CED.A.4 Equations and Formulas* *A.SSE.A.1 Kitchen Floor Tiles* *A.CED.A.1 Planes and wheat* *A-CED.A.1 Paying the rent* *A.REI.A.1 Zero Product Property 1* *A.CED.A.2 Clea on an Escalator* *S.ID.B.6,S.ID.C.7-9 Coffee and Crime* *Holocaust Commission Activities* ^ Career Mini Project <> LGBTQ Activity 1 + LGBTQ Activity 2 + Mean, Median, Mode - Career Exploration <> Amistad Activity *
Intervention Resources	Tier II-III Interventions: Concepts and Connections

Unit 2 Instructional Best Practices	
• Establish mathematic goals to focus learning • Direct Instruction • Mini Lessons • Identifying Similarities and Differences • Summarizing and Note Taking • Reinforcing Effort and Providing Recognition • Homework and Practice • Modeling • Cooperative Learning	• Gradual Release of Responsibility • Managing response rates • Checks for understanding • Diagrams, charts and graphs • Coaching • Use and connect mathematical representations. • Visuals • Collaborative problem solving • Active engagement strategies

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• Setting Objectives and providing Feedback • Cues, Questions, and Advance Organizers • Homework and Practice • Technology Infusion • Cooperative Learning • Checks for Understanding (Check for Understanding Strategies Description) • Closure	• Establishing metacognitive reflection and articulation • Implement tasks that promote reasoning and problem solving.

Unit 2 Related Misconception(s) /Clarifications
N.Q.A.1 Students may not realize the importance of the units' conversions in conjunction with the computation when solving problems involving measurements. Students often have difficulty understanding how ratios expressed in different units can be equal to one**.** For example 5280ft/1mi is simply one, and it is permissible to multiply by that ratio. Students need to make sure to put the quantities in the numerator or denominator so that the terms can cancel appropriately. Since today's calculating devices often display 8 to 10 decimal places, students frequently express answers to a much greater degree of precision than required. **A.CED.A.1** Students may believe that equations of linear, quadratic and other functions are abstract and exist only "in a math book," without seeing the usefulness of these functions as modeling real-world phenomena. Additionally, they believe that the labels and scales on a graph are not important and can be assumed by a reader, and that it is always necessary to use the entire graph of a function when solving a problem that uses that function as its model. Students may interchange slope and *y*-intercept when creating equations. For example, a taxi cab costs $4 for a dropped flag and charges $2 per mile. Students may fail to see that $2 is a rate of change and is slope while the $4 is the starting cost and incorrectly write the equation as $y = 4x + 2$ instead of $y = 2x + 4$. Given a graph of a line, students use the x-intercept for b instead of the y-intercept. Given a graph, students incorrectly compute slope as run over rise rather than rise over run. For example, they will compute slope with the change in *x* over the change in *y*. Students do not know when to include the "or equal to" bar when translating the graph of an inequality. Students do not correctly identify whether a situation should be represented by a linear, quadratic, or exponential function. Students often do not understand what the variables represent. For example, if the height *h* in feet of a piece of lava *t* seconds after it is ejected from a volcano is given by $h(t) = -16t2 + 64t + 936$ and the student is asked to find the time it takes for the piece of lava to hit the ground, the student will have difficulties understanding that $h = 0$ at the ground and that they need to solve for *t*. **A.REI.A.1** Students may believe that solving an equation such as $3x + 1 = 7$ involves "only removing the 1" failing to realize that the equation 1=1 is being subtracted to produce the next step. Additionally, students may believe that all solutions to radical and rational equations are viable, without recognizing that there are times when extraneous solutions are generated and have to be eliminated.

Unit 2 Interdisciplinary Connections

SL.PE.11-12.1.A Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
SL.PE.11-12.1.B Collaborate with peers to set rules for discussions (e.g., informal consensus, taking votes on key issues, presentation of alternate views); develop clear goals and assessment criteria (e.g., student developed rubric) and assign individual roles as needed.
RI.MF.9-10.6 Analyze, integrate, and evaluate multiple interpretations (e.g. recorded or live production of a play or recorded novel or poetry) of a single text or texts presented in different formats (visually, quantitatively).
Career Readiness, Life Literacies and Key Skills CRP4. Communicate clearly and effectively and with reason.

Unit 2 Integration of Technology

8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.

Unit 2 Academic Vocabulary

axis	equal to	factor	linear model
scale	great than	like terms	intercept
origin	greater than	distributive property	correlation coefficient
y-axis	equal to	rule	independent variable
x-axis	solution	equation	dependent variable
quantity	no solution	inequality	
accuracy	infinite	solution	
equation	equal	boundary line	
equality	equality	scatter plot	
inequality	coefficient	constant	
solution	constan	coefficient	
not equal to	variable	residual	
less than	expression	linear regression	
less than	term	slope	

Unit 3- Writing Linear Functions, Solving Systems of Linear Equations, and Exponential Functions

Course: Algebra 1	**Timeframe**: 24 Days

Unit 3 Focus/ Big Ideas

- To write equations of lines in slope-intercept form
- To write equations of lines in point-slope form
- To use scatter plots and lines to describe relationships between data
- To solve linear systems by graphing
- To solve linear systems by substitutions and elimination
- To solve equations by graphing
- To graph linear inequalities in two variables
- To write equivalent expressions involving powers
- To write and evaluate an nth root of a number
- To graph and write exponential functions
- To solve exponential equations (Algebra 2 content)

Unit 3 Pacing Guide- 24 days

Chapter		
Chapter 4	8 days	**Writing Linear Functions** 4.1 Writing Equations in Slope-Intercept Form 4.2 Writing Equations in Point-Slope Form 4.3 Writing Equations of Parallel and Perpendicular Lines 4.4 Scatter Plots and Lines of Fit 4.5 Analyzing Lines of Fit 4.6 Arithmetic Sequences (If time allows) 4.7 Piecewise Functions (Honors Track)
Chapter 5	8 days	**Solving Systems of Linear Equations** 5.1 Solving Systems of Linear Equations by Graphing 5.2 Solving Systems of Linear Equations by Substitution 5.3 Solving Systems of Linear Equations by Elimination 5.4 Solving Special Systems of Linear Equations 5.5 Solving Equations by Graphing 5.6 Graphing Linear Inequalities in Two Variables 5.7 Systems of Linear Inequalities
Chapter 6	days	**Exponential Functions and Sequences** 6.1 Properties of Exponents 6.2 Radicals and Rational Exponents

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		6.3 Exponential Functions 6.4 Exponential Growth and Decay 6.5 Solving Exponential Equations (Algebra 2 content) 6.6 Geometric Sequences (If time allows)

Unit 3 Essential Questions	Unit 3 Enduring Understandings
• How can you show mathematical relationships? • Why are linear functions useful in real-world settings? • Why would you use multiple representations of linear equations? • How are systems of linear equations useful in analyzing real-world situations? • How can graphical information be applied to practical situations? • How can you find the domain and range of a function?	• Representing mathematical ideas involves using a variety of representations such as graphs, numbers, algebra, words, and physical models to convey practical situations. • Functions are a mathematical way to describe relationships between two quantities that vary. • Functions can be represented in a variety of ways. • Understand the connections between proportional relationships, lines, and linear equations. • Write and graph exponential equations and functions to model, analyze, and solve real-world problems.

Unit 3 NJSLS Standards

Chapter	Standards	
Chapter 4	• A.CED.A.2 • F.BF.A.1a • F.BF.A.2 • F.IF.A.3 • F.IF.C.7b • F.LE.A.1b • F.LE.B.5 • S.ID.B.6 • S.ID.C.7 • S.ID.C.8 • S.ID.C..9	• Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. • Determine an explicit expression, a recursive process, or steps for calculation from a context. • Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. • Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$. (Algebra 2 content) • Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. • Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. • Interpret the parameters in a linear or exponential function in terms of a context. • Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. • Interpret the slope, intercept, and correlation coefficient of a data set of a linear model; distinguish between correlation and causation. • Compute (using technology) and interpret the correlation coefficient of a linear fit. • Distinguish between correlation and causation

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Chapter 5	• A.CED.A.3 • A.REI.C.5+ • A.REI.C.6 • A.REI.D.11 • A.REI.D.12	• 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. • 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. • Solve systems of linear equations algebraically (include using the elimination method) and graphically, focusing on pairs of linear equations in two variables. • 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 successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
Chapter 6	• N.RN.A.1 • N.RN.A.2 • A.CED.A.1 • A.CED.A.2 • A.REI.A.1 • A.REI.D.11 • A.SSE.B.3.c • F.BF.A.1a,b • F.BF.A.2 • F.IF.A.3 • F.IF.C.7.e • F.IF.C.8.b • F.LE.A.1 • F.LE.B.5 • S.ID.B.6.a	• 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. • Rewrite expressions involving radicals and rational exponents using the properties of exponents. • 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. • Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. • 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. • 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 successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. • Use the properties of exponents to transform expressions for exponential functions. • Determine an explicit expression, a recursive process, or steps for calculation from a context. • Combine standard function types using arithmetic operations. • Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (Algebra 2 content) • Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. • Graph exponential and logarithmic functions, showing intercepts and end behavior. (Algebra 1 is only exponential functions.) • Use the properties of exponents to interpret expressions for exponential functions. • Distinguish between situations that can be modeled with linear functions and with exponential functions. • Interpret the parameters in a linear or exponential function in terms of a context. • Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data.

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Unit 3 Instructional Plan

Pre-Assessment
Common Pre-assessment given prior to this unit to build a base of student understanding.

Unit 3 Evidence of Learning-Assessments	
Formative	Daily Warm-up, Daily Closure Activity, Daily Teacher Observations, Class Participation, Homework, Gimkits, Kahoots, Quizizz, Blooket, Paper Based Quiz, Academic Games, Group Work
Summative	Chapter Tests, Standards Mastery Assessments
Benchmark	MAP Test
Alternative Assessments	Project

Unit 3 Instructional and Supplemental Materials	
Instructional Materials	Concepts and Connections Chapters 4-6, Delta Math, CalcChat, Gimkit, Kahoot, Quizizz, Desmos, Edulastic, Math Medic, and Geogebra
Supplemental Unit Resources	*A.REI.C.6 Cash Box* *A.CED.A.3 Dimes and Quarters* *A.REI.C.5+ Solving Two Equations in Two Unknowns* *A.REI.D.12 Fishing Adventures 3* *F.IF.A.1 The Parking Lot* *F.IF.A.2 Yam in the Oven* *F.LE.A.1 Finding Linear and Exponential Models* *F.LE.A.2 Interesting Interest Rates* *F.BF.A.1a Skeleton Tower* *A.SSE.A.1 Mixing Candies* *F.IF.B.4 Warming and Cooling* *F.IF.B.4, F.IF.B.5 Average Cost* *F.LE.B.5 US Population 1982-1988* *F.IF.B.6 Temperature Change* *F.IF.C.7b Bank Account Balance* *Holocaust Commission Activities* ^ Mean, Median, Mode - Career Exploration <>
Intervention Resources	Tier II-III Interventions: Concepts and Connections

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Unit 3 Instructional Best Practices	
• Establish mathematic goals to focus learning • Direct Instruction • Mini Lessons • Identifying Similarities and Differences • Summarizing and Note Taking • Reinforcing Effort and Providing Recognition • Homework and Practice • Modeling • Cooperative Learning • Setting Objectives and providing Feedback • Cues, Questions, and Advance Organizers • Homework and Practice • Technology Infusion • Cooperative Learning • Checks for Understanding (Check for Understanding Strategies Description) • Closure	• Gradual Release of Responsibility • Managing response rates • Checks for understanding • Diagrams, charts and graphs • Coaching • Use and connect mathematical representations. • Visuals • Collaborative problem solving • Active engagement strategies • Establishing metacognitive reflection and articulation A.REI.C.6 • Implement tasks that promote reasoning and problem solving.

Unit 3 Related Misconception(s) /Clarifications
A.SSE.A.1 Extending beyond simplifying an expression, this cluster addresses interpretation of the components in an algebraic expression. A student should recognize that in the expression $2x + 1$, "2" is the coefficient, "2" and "x" are factors, and "1" is a constant, as well as "$2x$" and "1" being *terms* of the binomial expression**.** Development and proper use of mathematical language is an important building block for future content. Using real-world context examples, the nature of algebraic expressions can be explored**.** Have students create their own expressions that meet specific criteria (e.g., number of terms factorable, difference of two squares, etc.) and verbalize how they can be written and rewritten in different forms. Additionally, pair/group students to share their expressions and rewrite one another's expressions. Hands-on materials, such as algebra tiles, can be used to establish a visual understanding of algebraic expressions and the meaning of terms, factors and coefficients. Technology may be useful to help a student recognize that two different expressions represent the same relationship. For example, since $(x – y)(x + y)$ can be rewritten as $x2 – y2$, they can put both expressions into a graphing calculator (or spreadsheet) and have it generate two tables (or two columns of one table), displaying the same output values for each expression. Factoring by grouping is another example of how students might analyze the structure of an expression. To factor $3x(x – 5) + 2(x – 5)$, students should recognize that the "$x – 5$" is common to both expressions being added, so it simplifies to $(3x + 2)(x – 5)$**.** Students should become comfortable with rewriting expressions in a variety of ways until a structure emerges. A.SSE.B.3 Some students may believe that factoring and completing the square are isolated techniques within a unit of quadratic equations. Teachers should help students to see the value of these skills in the context of solving higher degree equations and examining different families of functions.

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Students may think that the minimum (the vertex) of the graph of $y = (x + 5)2$ is shifted to the right of the minimum (the vertex) of the graph $y = x2$ due to the addition sign. Students should explore examples both analytically and graphically to overcome this misconception.
Some students may believe that the minimum of the graph of a quadratic function always occur at the *y*-intercept.

A.REI.C.5+ & A.REI.C.6
Most mistakes that students make are careless rather than conceptual. Teachers should encourage students to learn a certain format for solving systems of equations and check the answers by substituting into all equations in the system. Some students believe that matrices are independent of other areas of mathematics.
A.REI.D.12
Students may believe that the graph of a function is simply a line or curve "connecting the dots," without recognizing that the graph represents all solutions to the equation.
Students may also believe that graphing linear and other functions is an isolated skill, not realizing that multiple graphs can be drawn to solve equations involving those functions.
Additionally, students may believe that two-variable inequalities have no application in the real world. Teachers can consider business related problems (e.g., linear programming applications) to engage students in discussions of how the inequalities are derived and how the feasible set includes all the points that satisfy the conditions stated in the inequalities.
A.CED.A.3
Students may believe that equations of linear, quadratic and other functions are abstract and exist only "in a math book," without seeing the usefulness of these functions as modeling real-world phenomena.
Additionally, they believe that the labels and scales on a graph are not important and can be assumed by a reader, and that it is always necessary to use the entire graph of a function when solving a problem that uses that function as its model.
Students may interchange slope and *y*-intercept when creating equations. For example, a taxi cab costs $4 for a dropped flag and charges $2 per mile. Students may fail to see that $2 is a rate of change and is slope while the $4 is the starting cost and incorrectly write the equation as $y = 4x + 2$ instead of $y = 2x + 4$.
Given a graph of a line, students use the x-intercept for b instead of the y-intercept.
Given a graph, students incorrectly compute slope as run over rise rather than rise over run. For example, they will compute slope with the change in *x* over the change in *y*.
Students do not know when to include the "or equal to" bar when translating the graph of an inequality.
Students do not correctly identify whether a situation should be represented by a linear, quadratic, or exponential function.
Students often do not understand what the variables represent. For example, if the height *h* in feet of a piece of lava *t* seconds after it is ejected from a volcano is given by $h(t) = -16t2 + 64t + 936$ and the student is asked to find the time it takes for the piece of lava to hit the ground, the student will have difficulties understanding that $h = 0$ at the ground and that they need to solve for *t.*
F.IF.A.1, F.IF.A.2, F.IF.A.3

Students may believe that all relationships having an input and an output are functions, and therefore, misuse the function terminology.
Students may also believe that the notation *f(x)* means to multiply some value *f* times another value *x*. The notation alone can be confusing and needs careful development. For example, $f(2)$ means the output value of the function *f* when the input value is 2.
F.LE.A.1 & F.LE.A.2
Students may believe that all functions have a first common difference and need to explore to realize that, for example, a quadratic function will have equal second common differences in a table.

Unit 3 Interdisciplinary Connections

W.IW.9-10.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
RI.MF.9-10.6 Analyze, integrate, and evaluate multiple interpretations (e.g. recorded or live production of a play or recorded novel or poetry) of a single text or texts presented in different formats (visually, quantitatively).
9.1.12.CDM.8: Compare and compute interest and compound interest and develop an amortization table using business tools

Unit 3 Integration of Technology

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

Unit 3 Academic Vocabulary		
Arithmetic Sequence Asymptote Boundary Coefficients Domain Exponential	Explicit Function Geometric Sequence In-equalities Linear Range	Rate of change Rational Recursively Symmetries

Unit 4 Polynomial Equations and Factoring, Graphing Quadratic Equations, Solving Quadratic Equations, Radical Functions and Equations

Course: Algebra 1	**Timeframe:** 37 Days

Unit 4 Focus/ Big Ideas

- To add. subtract, multiple, and divide polynomials
- To use patterns to find products of polynomials
- To solve polynomial equations in factored form
- To graph and describe functions
- To graph and use functions in intercept form
- To use properties of radicals to write equivalent expressions
- To use graphs to solve quadratic equations and find zeros of functions
- To solve quadratic equations using square roots and by completing the square
- To use the Quadratic Formula
- To solve radical equations

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Unit 4 Pacing Guide- 37 days

Chapter		
Chapter 7	12 days	**Polynomial Equations and Factoring** 7.1 Adding and Subtracting Polynomials 7.2 Multiplying and Dividing Polynomials 7.3 Special Products of Polynomials 7.4 Solving Polynomial Equations in Factored Form 7.5 Factoring $x^2 + bx + c$ 7.6 Factoring $ax^2 + bx + c$ 7.7 Factoring Special Products 7.8 Factoring Polynomials Completely
Chapter 8	7 days	**Graphing Quadratic Functions** 8.1 Graphing $f(x) = ax^2$ 8.2 Graphing $f(x) = ax^2 + c$ 8.3 Graphing $f(x) = ax^2 + bx + c$ 8.4 Graphing $f(x) = a(x- h)^2 + k$ (if time allows) 8.5 Using Intercept Form (If time allows) 8.6 Comparing Linear, Exponential, and Quadratic Functions
Chapter 9	11 days	**Solving Quadratic Equations** 9.1 Properties of Radicals 9.2 Solving Quadratic Equations by Functions 9.3 Solving Quadratic Equations Using Square Roots 9.4 Solving Quadratic Equations by Completing the Square (if time allows) 9.5 Solving Quadratic Equations Using the Quadratic Formula 9.6 Solving Nonlinear Systems of Equations (if time allows)
Chapter 10	7 days	**Radical Functions and Equations** 10.1 Graphing Square Root Functions 10.2 Graphing Cube Root Functions (Honors Track) 10.3 Solving Radical Equations 10.4 Inverse of a Function (Honors Track)

Unit 4 Essential Questions	Unit 4 Enduring Understandings
● How are adding and multiplying polynomial expressions different from each other? ● What does the degree of a polynomial tell you about its related polynomial function? ● How are quadratic functions used to model, analyze, and interpret mathematical relationships?	● Polynomials are closed under the operations of addition, subtraction and multiplication. ● Solving polynomials involves the reversal of operations, the distributive property and the rules of exponents. ● Perform arithmetic operations on polynomials.

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• Why is it advantageous to know a variety of ways to solve and graph quadratic functions? • What are the advantages of a quadratic function in standard form? • How is any quadratic function related to the parent quadratic function $y = x^2$? • How can you model and classify polynomials?	• Solve problems involving polynomial equations by factoring. • Graph quadratic functions and interpret key features of their graphs.

Unit 4 NJSLS Standards

Chapter	Standards	
Chapter 7	• A.APR.A.1 • A.REI.A.1 • A.REI.B.4b • A.SSE.A.1 • A.SSE.A.2 • A.SSE.B.3.a	• 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. • 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. • Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. (Completing the square is Algebra 2) • Interpret expressions that represent a quantity in terms of its context. • Use the structure of an expression to identify ways to rewrite it. • a. Factor a quadratic expression to reveal the zeros of the function it defines.
Chapter 8	• A.CED.A.2 • A.SSE.B.3a • F.BF.A.1.a,b • F.BF.B.3 • F.IF.B.4 • F.IF.B.6 • F.IF.C.7 • F.IF.C.7.a • F.IF.C.8 • F.IF.C.9 • F.IE.A.3	• Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. • Factor a quadratic expression to reveal the zeros of the function it defines. • Determine an explicit expression, a recursive process, or steps for calculation from a context. • Combine standard function types using arithmetic operations. • 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. • 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. • Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. • Graph linear and quadratic functions and show intercepts, maxima, and minima. • 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. • Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). • Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

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Chapter 9	• N.RN.A.3 • A.CED.A.1 • A.CED.A.4 • A.REI.B.4 • A.REI.C.7 • A.REI.D.11 • A.APR.B.3.b • F.IF.B.4 • F.IF.C.7.a • F.IF.C.8.a • S.ID.B.6.a	• Simplify radicals, including algebraic radicals (e.g. $\sqrt[3]{54} = 3\sqrt[3]{2}$, simplify $\sqrt{32x2}$) • 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. • Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R. • Solve quadratic equations in one variable. • Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. • 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, • Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. • 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. • Graph linear and quadratic functions and show intercepts, maxima, and minima. • 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. • Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data.
Chapter 10	• A.CED.A.1 • A.CED.A.2 • F.BF.B..B.3 • F.BF.B.4 • F.IF.B.6 • F.IF.C.7.b • F.IF.C.9 • F.LE.A.2	• Create equations and inequalities in one variable and use them to solve problems. • Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. • 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. • a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. • Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. • Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. • Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). • Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs

Unit 4 Instructional Plan

Pre-Assessment

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Common Pre-assessment given prior to this unit to build a base of student understanding.

Unit 4 Evidence of Learning-Assessments	
Formative	Daily Warm-up, Daily Closure Activity, Daily Teacher Observations, Class Participation, Homework, Gimkits, Kahoots, Quizizz, Blooket, Paper Based Quiz, Academic Games, Group Work
Summative	Chapter Tests, Standards Mastery Assessments
Benchmark	MAP Test
Alternative Assessments	Project

Unit 4 Instructional and Supplemental Materials	
Instructional Materials	Concepts and Connections Chapters 7-10, CalcChat, Delta Math, Gimkit, Kahoot, Quizizz, Desmos, Edulastic, Math Medic, and Geogebra
Supplemental Unit Resources	*A.APR.A.1 Powers of 11* *A.SSE.A.2 Equivalent Expressions* *A.REI.B.4 Visualizing Completing the Square* *A.REI.B.4 Braking Distance* *A.REI.B.4 Two Squares are Equal* *F.IF.B.4 Words – Tables - Graphs* *F.IF.B.5 The restaurant* *A.SSE.B.3 Profit of a company* *A.SSE.B.3 Rewriting a Quadratic Expression* *F.IF.C.7a Graphs of Quadratic Functions* *F.IF.C.8a Springboard Dive* *F.IF.C.8a Which Function?* *F.IF.B.9 Throwing Baseballs* *F.IF.B.6 Mathemafish Population* *F.LE.A.3 Population and Food Supply* *F.BF.B.3 Identifying Even and Odd Functions* *F.BF.B.3 Transforming the graph of a function* *A.REI.D.11 Introduction to Polynomials – College Fund* A.APR.B.2 The Missing Coefficient *A.APR.B.3 Graphing from Factors 1* *Holocaust Commission Activities* ^ Amistad Activity * Mean, Median, Mode - Career Exploration <>

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Intervention Resources	Tier II-III Interventions: Concepts and Connections

Unit 4 Instructional Best Practices	
• Establish mathematic goals to focus learning • Direct Instruction • Mini Lessons • Identifying Similarities and Differences • Summarizing and Note Taking • Reinforcing Effort and Providing Recognition • Homework and Practice • Modeling • Cooperative Learning • Setting Objectives and providing Feedback • Cues, Questions, and Advance Organizers • Homework and Practice • Technology Infusion • Cooperative Learning • Checks for Understanding (Check for Understanding Strategies Description) • Closure	• Gradual Release of Responsibility • Managing response rates • Checks for understanding • Diagrams, charts and graphs • Coaching • Use and connect mathematical representations. • Visuals • Collaborative problem solving • Active engagement strategies • Establishing metacognitive reflection and articulation • Implement tasks that promote reasoning and problem solving.

Unit 4 Related Misconception(s) /Clarifications

A.SSE.A.2

Students may believe that the use of algebraic expressions is merely the abstract manipulation of symbols.
Students may also believe that an expression cannot be factored because it does not fit into a form they recognize. They need help with reorganizing the terms until structures become evident.
Students will often combine terms that are not like terms. For example, $2 + 3x = 5x$ or $3x + 2y = 5xy$.
Students sometimes forget the coefficient of 1 when adding like terms. For example, x + 2x + 3x = 5x rather than 6x.
Students will forget to distribute to all terms when multiplying. For example, $6(2x + 1) = 12x + 1$ rather than $12x + 6$.
Students may not follow the Order of Operations when simplifying expressions. For example, $4x2$ when $x = 3$ may be incorrectly evaluated as $4•32 = 122 = 144$, rather than $4•9 = 36$. Another common mistake occurs when the distributive property should be used prior to adding/subtracting. For example, $2 + 3(x – 1)$ incorrectly becomes $5(x – 1) = 5x – 5$ instead of $2 + 3(x – 1) = 2 + 3x – 3 = 3x – 1$.
Students routinely see $–3^2$ as the same as $(–3)^2 = 9$. A method that may clear up the misconception is to have students rewrite as $–x^2 = –1•x^2$ so they know to apply the exponent before the multiplication of –1.

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Students frequently attempt to "solve" expressions. Many students add "= 0" to an expression they are asked to simplify. Students need to understand the difference between an equation and an expression.

Students commonly confuse the properties of exponents, specifically the product of powers property with the power of a power property. For example, students will often simplify $(x^2)^3 = x^5$ instead of x^6.

Students will incorrectly translate expressions that contain a difference of terms. For example, 8 less than 5 times a number is often incorrectly translated as $8 - 5n$ rather than $5n - 8$.

A.APR.A.1

Some students will apply the distributive property inappropriately. Emphasize that it is the *distributive property of multiplication over addition*. For example, the distributive property can be used to rewrite $2(x + y)$ as $2x + 2y$, because in this product the second factor is a sum (i.e., involving addition). But in the product $2(xy)$, the second factor,(xy), is itself a product, not a sum.
Students often forget to distribute the subtraction to terms other than the first one. For example, students will write $(4x + 3) - (2x + 1) = 4x + 3 - 2x + 1 = 2x + 4$ rather than $4x + 3 - 2x - 1 = 2x + 2$.
Students will change the degree of the variable when adding/subtracting like terms. For example, $2x + 3x = 5x2$ rather than $5x$.
Students may not distribute the multiplication of polynomials correctly and only multiply like terms. For example, they will write $(x + 3)(x - 2) = x^2 - 6$ rather than $x^2 - 2x + 3x - 6$.

A.REI.D.11

Students may believe that the graph of a function is simply a line or curve "connecting the dots," without recognizing that the graph represents all solutions to the equation.
Students may also believe that graphing linear and other functions is an isolated skill, not realizing that multiple graphs can be drawn to solve equations involving those functions.
Additionally, students may believe that two-variable inequalities have no application in the real world. Teachers can consider business related problems (e.g., linear programming applications) to engage students in discussions of how the inequalities are derived and how the feasible set includes all the points that satisfy the conditions stated in the inequalities.

A.CED.A.1

Students may believe that equations of linear, quadratic and other functions are abstract and exist only "in a math book," without seeing the usefulness of these functions as modeling real-world phenomena.
Additionally, they believe that the labels and scales on a graph are not important and can be assumed by a reader, and that it is always necessary to use the entire graph of a function when solving a problem that uses that function as its model.
Given a graph of a line, students use the x-intercept for b instead of the y-intercept.
Students do not correctly identify whether a situation should be represented by a linear, quadratic, or exponential function.

F.BF.A.1

Students may believe that the best (or only) way to generalize a table of data is by using a recursive formula.
Students naturally tend to look "down" a table to find the pattern but need to realize that finding the 100th term requires knowing the 99th term unless an explicit formula is developed. Students may also believe that arithmetic and geometric sequences are the same.
Students need experiences with both types of sequences to be able to recognize the difference and more readily develop formulas to describe them.

Unit 4 Interdisciplinary Connections

W.IW.9-10.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
RI.MF.9-10.6 Analyze, integrate, and evaluate multiple interpretations (e.g. recorded or live production of a play or recorded novel or poetry) of a single text or texts presented in different formats (visually, quantitatively).
9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas

Unit 4 Integration of Technology

8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.

Unit 4 Academic Vocabulary			
Completing the square	Interval	Parameter	Root
Domain	Irrational number	Polynomial	Quantitative relationship
Exponential function	Linear function	Rational number	Quadratic Function
Extreme Values	Maxima	Relative maximum	Symmetry
Factoring	Maximum	Relative minimum	Zeros
Function	Minima		
Intercepts	Minimum		

Modifications/ Accommodations for Special Education Students	Accommodations for 504 Students	Modifications for At-Risk Students
• Modify activities/assignments/projects	• Breakdown activities/assignments/projects/assessments into manageable units	• Place near positive peers • Check-ins with student • Verbal instructions written and left on board

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• Breakdown activities/assignments/projects/assessments into manageable units • Additional time to complete activities/assignments/projects/assessments • Provide an option for alternative activities/assignments/projects/assessments • Allow student to receive reading text in various forms (written, verbal, audio) • Pre-teach new vocabulary • Modify Content • Modify Amount of work given • Modify Assessment • Modify Homework • Re-teach skill if needed • Allow student to make test corrections or re-take assessment • Adjust Pacing of Content • Small Group Instruction • Individual Intervention/Remediation • Additional Support Material • Lower-Level Text • Guided Notes • Graphic Organizers *** Implementation based on Student's IEP**	• Additional time to complete activities/assignments/projects/assessments • Provide an option for alternative activities/assignments/projects/assessments • Small Group Instruction • Intervention/Remediation • Individual Intervention/Remediation • Additional Support Materials • Guided Notes • Graphic Organizers • Tutoring *** Implementation based on Student's 504**	• Chunk directions • Have student repeat classroom expectations • Reword instructions if needed • Provide examples on board • Provide scaffolding • Assist with transitions • Identify go-to students • for organizational support • Check and sign planner • Weekly organization time • Allow extra time as needed • Oral instructions repeated and written on board

English Language Learners	Extensions for Gifted Students
• Vocabulary instruction • Pre-Reading strategies • Graphic organizers • Reading strategies • Tutoring • Pair students up with peers • Provide visual representation	• Activities/assignments/projects/assessments • Provide an option for alternative instructional activities • Higher-level content • Adjust pacing of content • Small group enrichment • Individual enrichment • Higher-level text

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