High School Course Description for **Algebra 1**

Course Title: Algebra 1

Curricular Area: Mathematics

Course Number: MTH 101, 102, 131, 132, 181, 182, 1011, 1012, 1013, 1014

Length: One year

Grade Level: 9-12

Prerequisites: None

Meets a UC a-g Requirement: Yes – C

Meets NCAA Requirement: Pending

Meets High School Graduation Requirement for:
Mathematics

Course Description
Through the study of algebra, a student develops the ability to create logical arguments using symbolic representations. Students will be able to apply algebraic concepts through modeling problems and multiple representations. Students will apply their conceptual understanding of algebra to other content areas. In addition, students will be able to use technology appropriately throughout the course. Algebra I is a one-year course aligned to the Common Core Mathematics Standards. It is designed to prepare students for successful entry into higher level mathematics courses and completion of the high school exit examination.

Alignment
This course is aligned to the California Common Core State Standards for Algebra 1.

Instructional Materials

Required Textbook(s)	Suggested Video/DVDs//Films	Software
1. Holt	3. TBD	5. TBD
Supplemental Materials	Web Sites	
2. TBD	4. TBD	

Exit Criteria

Activities	Percentage
Coursework/Participation	20%
Assessments	60%
Final Examination	20%
Total:	100%

Development Team
This course of study was developed in spring 2013 by a District Transition Team comprised of teachers from all 3 high schools.

SEMESTER ONE

Key Assignments:

- **TBD**

Assessments:

- **Common Site Driven Assessments**
- **District Benchmarks**
- **District Final**

Week	
1	Unit 1 – Single Variable Equations
2	
3	
4	
5	
6	Unit 2 – Linear Function
7	
8	
9	
10	
11	Unit 3 – Systems of Linear Equations and Inequalities
12	
13	
14	Unit 4 – Polynomials
15	
16	
17	Review
18	Finals

SEMESTER TWO

Key Assignments:

- **TBD**

Assessments:

- **Common Site Driven Assessments**
- **District Benchmarks**
- **District Final**

Week	
1	Unit 5 – Factoring
2	
3	
4	Unit 6 – Graphing Quadratics
5	
6	
7	Unit 7 – Solving Quadratics
8	
9	
10	
11	Unit 8 – Exponentials (Graphing Calculators needed)
12	
13	
14	Unit 9 – Interpreting Data
15	
16	
17	Review
18	Finals

CJUSD Secondary Math Unit Outline

Unit Title: Unit 1 – Single Variable Equations

Grade Level/Course: Algebra 1 | Approximate Length of Unit: 22 Days

Priority Standards	Supporting Standards
A-REI 3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **A-REI 3.1** Solve one-variable equations and inequalities involving absolute value, graphing the solutions and interpreting them in context. [In Algebra I this standard addresses **linear functions**.] **A-CED 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.* [In Algebra 1 the standard addresses **linear**, quadratic, and exponential (integer inputs only) function only.] **A-CED 4** 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.*	**A-REI 1** Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. **N-Q 1** 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. **N-RN 3** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. **A-SSE 1** Interpret expressions that represent a quantity in terms of its context. **A-SSE 1.a** Interpret parts of an expression, such as terms, factors, and coefficients. **A-SSE 1.b** Interpret complicated expressions by viewing one or more of their parts as a single entity.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to use the properties for rational and irrational numbers How to interpret expressions in a real life problem (i.e. word problems, video, etc.) How to interpret parts of an expression such as coefficients, terms, factors, etc. How to interpret complicated expressions by viewing one part as a single entity How to create linear equations and inequalities in one-variable, including those involving absolute value, and use them to solve problems	Explain each step as they solve for the variable Solve multi-step linear equations and inequalities in one variable Solve compound inequalities in one variable Use units of measurement in multi-step problems and formulas Graph solutions of an inequality in one variable on a number line Solve one-variable equations and inequalities involving absolute value Graph the solutions of absolute value inequalities on a number line Solve an equation with multiple variables for a specific variable

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Students will solve multi-step linear equations and inequalities in one variable, including those involving absolute value, and be able to graph the solution sets on a number line. Students will be able to set up from a real life problem a linear equation or inequality in one variable, including those involving absolute value, and be able to interpret the solution in the context of the original situation. Students will be able to use the properties of rational numbers to explain each step of their solution process.	What is the process to solve a multi-step equation or inequality? What does the solution to an equation or inequality look like on a number line? How are the solutions to an equation and an inequality different? What does the solution to an absolute value inequality look like? How do you write an expression or equation from a word problem? How do you determine if the solution to an equation or inequality makes sense in context? What does an absolute value equation ask you to find?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Solve multi-step linear equations in one variable Solve multi-step linear inequalities in one variable Graph the solutions of an inequality on a number line Solve one-variable equations involving absolute value Solve linear inequalities involving absolute value Graph the solutions of an absolute value inequality on a number line Create equations & use them to solve problems Solve a literal equation for a given variable Notes* MC 50-60% of the assessment Minimal number of MR problems Not all CR problems should be word problems (consider some direct solving problems where students show their work)
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.

Scoring Criteria for Performance Task	Rubric based scoring (Teacher Created) Possible Grading Sessions

What Prior Knowledge Should be Activated?	**How Will it be Activated?**
Associative, commutative, identity, inverse, and distributive properties Order of operations Solve one and 2-step equations Operations of integers Metric and Standard units Definition of an inequality How to plot points on a number line Properties of rational numbers Definition of absolute value Combining like terms	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Rational	Sum	Inverse Operation
Literal Equation	Difference	Variable
Expression	Product	Constant
Equation	Quotient	Multiplication Property of Equality
Absolute Value	Terms	Inverse Property of Multiplication
Inequality	Factor	Addition Property of Equality
Compound Inequality	Coefficient	Inverse Property of Addition

Unit Sequencing:		
Chunk 1	**Chunk 2**	**Chunk 3**
Solve multi-step equations involving rational numbers in one variable Use units of measure in multi-step problems Interpret expressions that represent quantities in terms of a context Interpret parts of an expression Solve literal equation for a given variable Create equations and use them to solve problems	Solve multi-step linear inequalities and graph the solution sets Create inequalities and use them to solve problems	Interpret complicated expressions by viewing one part as a single entity Solve one-variable equations and inequalities involving absolute values and graph the solution sets Create with absolute values, and use them to solve problems

Resources/Tools
Whiteboards and markers Graphing calculator Projector Elmo Computer MOBI Textbook Paper Pencil

Reflection on Best Practices (Feedback Loop)
Teachers (and students) justifying each step in the process. Concept development (ex. $x = 2$, what does that mean?) Whiteboards and regular Checks for Understanding

CJUSD Secondary Math Unit Outline

Unit Title: Unit 2 – Linear Functions

Grade Level/Course: Algebra 1 | Approximate Length of Unit: 31 Days

Priority Standards	Supporting Standards
F-IF 1 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. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*). **F-IF 2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. **F-IF 4** 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. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* [In Algebra I this standard addresses **linear**, exponential, absolute value and quadratic functions.] **F-IF 5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* [In Algebra I this standard addresses **linear**, exponential, absolute value and quadratic functions.] **A-CED 2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [In Algebra I this standard addresses graphing with only 2 variables] [In Algebra I this standard addresses **linear**, exponential, and quadratic functions.] **F-IF 7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	**F-BF 4** Find inverse functions. **F-BF 4.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. [In Algebra I, this standard addresses **linear** inverses only.] **F-IF 6** 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. **N-Q 1** 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. **N-Q 3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **A-SSE 2** Use the structure of an expression to identify ways to rewrite it. **F-IF 8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **F-LE 1.b** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. **A-CED 3 Represent constraints by equations or inequalities**, and by systems of equations and/or inequalities, and **interpret solutions as viable or non-viable options in a modeling context**. [In Algebra I this standard addresses **linear** and quadratic systems of equations.] **S-ID 7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

F-IF 7.a Graph **linear** and quadratic functions and **show intercepts**, maxima, and minima. **A-REI 10** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). **F-BF 1** Write a function that describes a relationship between two quantities.	**A-SSE 1** Interpret expressions that represent a quantity in terms of its context. **F-LE 5** Interpret the parameters in a **linear** or exponential function in terms of a context. **F-IF 9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [In Algebra I this standard addresses **linear**, exponential, quadratic, **absolute value** and piecewise defined functions.] **F-BF 3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* [In Algebra I this standard addresses **linear**, exponential, quadratic, and **absolute value functions**.] **S-ID 6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. **S-ID 6.a** Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize **linear**, quadratic, and exponential models.* **S-ID 6.b** Informally assess the fit of a function by plotting and analyzing residuals. **S-ID 6.c** Fit a linear function for a scatter plot that suggests a linear association. **A-SSE 1.b** 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.* **F-IF 3** 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 $n \geq 1$.* **F-BF 1.a** Determine an explicit expression, a recursive process, or steps for calculation from a context.

	F-BF 2 Write **arithmetic** and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. **F-LE 2** Construct **linear** and exponential functions, including **arithmetic** and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to use function notation How to identify the x- and y- intercepts for linear functions graphically How to graphically identify the general type of slope (positive, negative, zero, or undefined) How to recognize situations that can be represented by a linear function How to interpret slope and intercepts if given a set of data How to compare functions represented in different ways (tables, graphs, equations, words) How to graph an absolute value function	Determine domain and range Identify the effect that different slope and y-intercept have on the graph of a linear function Find the slope of a linear function graphically Identify the effect that different slopes and y-intercepts have on the graph of a linear function, given the equation Identify the x- and y- intercepts algebraically Describe the slope of a linear function, or set of points, as positive, negative, zero, or undefined Graph a linear function Find the slope of a linear function algebraically Create and label an appropriate coordinate axis when graphing Rewrite linear functions into slope-intercept, point-slope, and/or standard form Graph linear inequalities Write a linear function describing a relationship between two quantities Define appropriate quantities for linear modeling Graph linear functions that represent relationships between quantities (modeling) Represent constraints and interpret solutions as viable or non-viable when modeling with linear functions Find inverse functions both algebraically and graphically Recognize sequences as functions Write arithmetic sequences recursively Write arithmetic sequences explicitly Write an expression or recursive process from a context Construct arithmetic sequences given a graph Construct arithmetic sequences given a description of a relationship Construct arithmetic sequences given two input-output pairs

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Graph linear functions Find the slope of a line Identify key features of a graph of a linear function Write an equation in slope-intercept form, standard form, & point slope form Write a linear function Find the inverse of a linear function	What are the different ways to represent domain and range? How do you find the slope of a line, and what does it mean? What are the characteristics of a linear function? What are the different forms to write a linear function? How do you graph a linear function? How do you write a linear function from a word problem? How do you find the inverse of a linear function? What is an inverse function? What is the difference between explicit and recursive sequences? How can you construct a sequence when given a graph, description of a relationship, or a set of input/output pairs?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Domain and range (interval notation) Identifying x- and y-intercepts for linear functions Describing slope as positive, negative, zero, or undefined given a graph Graphing linear functions Find the slope of a linear function algebraically Rewriting linear functions in slope-intercept form Write a linear function describing a relationship between two quantities Find the inverse of a linear function algebraically Graph absolute value functions Find the slope of a line of best fit
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring (Teacher Created) Possible Grading Sessions

What Prior Knowledge Should be Activated?	How Will it be Activated?
Inputs and Outputs Creating an input/output table Evaluating expressions Coordinate pairs Graphing functions with "y =…" Rectangular coordinate plane Familiarity with linear functions Meaning of rate of change Simplifying fractions Dividing by zero is undefined Solving for a variable Function notation Absolute value	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Domain	Slope-Intercept Form	Reflection
Range	Point-Slope Form	Rate of Change
Function	Input	Absolute Value Function
Function Notation	Output	Sequence
Slope	Set Notation	Series
Intercepts	Interval Notation	Arithmetic
Ordered Pair	Linear Inequality	Recursive
Rectangular Coordinate Plane	Modeling	Explicit
Linear Function	Inverse Function	Terms
Standard form of a Linear Function	Table	

Unit Sequencing:		
Chunk 1	**Chunk 2**	**Chunk 3**
Domain and range Function notation	Identifying the effect of slope on a graph Identifying the x- and y-intercepts for linear functions graphically Describe slope as positive, negative, zero, or undefined	Identify effect of slope and y-intercept on the graph of a linear function Identify x- and y- intercepts algebraically Describe slope as positive, negative, zero, or undefined given a linear function or a set of points Graph linear functions Find slope of linear functions algebraically Create and label an appropriate coordinate plane when graphing Rewrite linear functions into standard, slope-intercept, and/or point-slope form

Chunk 4	Chunk 5	Chunk 6
Graph linear inequalities	Write linear functions describing a relationship between two quantities Recognize situations that can be represented by a linear function Define appropriate and accurate quantities for linear modeling Graph linear functions that represent relationships between quantities Represent constraints and interpret solutions as viable or non-viable when modeling linear functions Given a set of data, interpret slope and intercept Compare functions represented in different ways	Find the inverse of a linear function algebraically and graphically

Chunk 7
Recognize sequences as functions Write arithmetic sequences recursively Write arithmetic sequences explicitly Write an expression or recursive process from a context Construct arithmetic sequences given a graph Construct arithmetic sequences given a description of a relationship Construct arithmetic sequences given two input-output pairs

Resources/Tools
Graph paper Graphing calculator

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title: Unit 3 – Systems of Linear Equations and Inequalities

Grade Level/Course: Algebra 1 Approximate Length of Unit: 13 Days

Priority Standards	Supporting Standards
A-REI 6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. **A-CED 3** Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. [In Algebra I this standard addresses **linear** and quadratic systems of equations.]	**A-REI 5**.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. **A-REI 11** 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. **A-SSE 1** Interpret expressions that represent a quantity in terms of its context. **F-IF 7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **A-REI 12** Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. [In Algebra I, this standard addresses **linear inequalities**.]

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to interpret solutions to a linear system of equations in context How to identify constraints on linear systems of equations How to identify constraints on linear systems of inequalities How to interpret solutions to a linear system of inequalities in context	Solve systems of linear equations graphically Solve systems of linear equations algebraically Prove that by manipulating one equation in a system the resulting system has the same solution as the original system Solve systems of linear inequalities graphically Solve the solutions to linear systems of equations approximately using technology

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Solve systems of linear equations & inequalities graphically, Solve systems of linear & quadratic equations algebraically, Write a system of equations Write a system of Inequalities	What does the solution to a system of equations represent? What are the three methods for solving a system of linear equations? In what situations would a system of equations result in "no solution" or "infinitely many solutions"? How do you know the solution to a system is viable in the context of the problem? How do you write a system of equations given a word problem?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Solve systems of linear equations graphically Solve systems of linear equations algebraically Solve systems of linear inequalities graphically Graph a linear inequality
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	How Will it be Activated?
Graphing linear functions Solve equations for a single variable Decoding a word problem Parallel Lines	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Solution to a System of Equations Solution region to a system of inequalities	Linear	Constraints

Unit Sequencing:		
Chunk 1	**Chunk 2**	**Chunk 3**
Solve systems of linear equations graphically	Solve systems of linear equations algebraically Prove that by manipulating (e.g. multiplying by a nonzero constant) one equation in a system the resulting system has the same solution as the original system	Solve systems of linear inequalities graphically Graph linear inequalities

Chunk 4	Chunk 5
Find the solutions to systems of equations approximately using technology. Include linear and absolute value.	Interpret solutions to a system of equations in context Identify constraints on systems of equations Identify constraints on systems of inequalities Interpret solutions to a system of inequalities in context

Resources/Tools

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title: Unit 4 – Polynomials

Grade Level/Course: Algebra 1 | Approximate Length of Unit: 13 Days

Priority Standards	Supporting Standards
A-APR 1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	**A-SSE 1.a** Interpret parts of an expression, such as terms, factors, and coefficients. **A-SSE 1.b** Interpret complicated expressions by viewing one or more of their parts as a single entity. **A-SSE 2** Use the structure of an expression to identify ways to rewrite it. **A-SSE 3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. **F-BF 1.b** Combine standard function types using arithmetic operations. **F-IF 8.b** Use the properties of exponents to interpret expressions for exponential functions.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to identify terms, factors, and coefficients or polynomials	Add and subtract polynomials Multiply polynomials Add, subtract, and multiply functions

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Operations on polynomials, Operations on functions Apply rules & properties of exponents	How do you simplify polynomial expressions? How do you combine functions?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Add polynomials Subtract Polynomials Multiply Polynomials
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	**How Will it be Activated?**
Combining like terms Integer addition and subtraction Distributive property Integer multiplication Meaning of a constant and a coefficient Function notation Knowledge of perfect squares up to 144	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Monomial	Coefficients	Linear
Binomial	Constant	Quadratic
Trinomial	Factor	Cubic
Polynomial	Greatest Common Factor	Function
Terms	Perfect Squares	Difference

Unit Sequencing:	
Chunk 1	**Chunk 2**
Add, subtract, and multiply polynomials Identify terms, factors, and coefficients of polynomials	Operations with functions (add, subtract, and multiply)

Resources/Tools

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title Unit 5 – Factoring

Grade Level/Course Algebra 1 Approximate Length of Unit 17 Days

Priority Standards	Supporting Standards
A-SSE 1.a Interpret parts of an expression, such as terms, factors, and coefficients. **A-SSE 2** Use the structure of an expression to identify ways to rewrite it. **A-SSE 3.a** Factor a quadratic expression to reveal the zeros of the function it defines.	**A-SSE 1.b** Interpret complicated expressions by viewing one or more of their parts as a single entity. **A-SSE 3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. **F-IF 8.b** Use the properties of exponents to interpret expressions for exponential functions.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to factor a quadratic expressions	Factor expressions by greatest common factor (degree 2) Factor expressions using the difference of squares (degree 2) Factor quadratic trinomials (where a=1, or where a>1)

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Factor quadratics	How do you factor a difference of squares? What is the process for factoring a trinomial?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Factor expressions using the difference of squares (degree 2) Factor quadratic trinomials where a=1 Factor quadratic trinomials where a>1

Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	**How Will it be Activated?**
Distributive property Find the GCF of two numbers Polynomial Multiplication	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Monomial	Coefficients	Linear
Binomial	Constant	Quadratic
Trinomial	Factor	Cubic
Polynomial	Greatest Common Factor	Function
Terms	Perfect Squares	Difference

Unit Sequencing:
Factor expressions by greatest common factor (degree 2) Factor expressions using the difference of squares (degree 2) Factor quadratic trinomials where a=1 and a>1

Resources/Tools

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title: Unit 6 – Graphing Quadratics

Grade Level/Course: Algebra 1 Approximate Length of Unit: 16 Days

Priority Standards	Supporting Standards
F-IF 1 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. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*). **F-IF 4** 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. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* ☐[In Algebra I this standard addresses linear, exponential, absolute value and **quadratic** functions.] **F-IF 7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **F-IF 7.a** Graph linear and **quadratic functions** and show intercepts, maxima, and minima. **F-BF 3** 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. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* [In Algebra I this standard addresses linear, exponential, **quadratic**, and absolute value functions.]	**F-IF 2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. **F-IF 5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* [I^n Algebra I this standard addresses linear, exponential, absolute value and quadratic functions.] **F-IF 9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* [In Algebra I this standard addresses linear, exponential, **quadratic**, absolute value and piecewise defined functions.] **A-REI 7** Solve a simple system consisting of a **linear equation and a quadratic equation** in two variables algebraically and graphically. **A-REI 11** 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.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
Domain and range of quadratics How to relate the domain of a function to its graph and explain what it relates to in the real world How to graph a quadratic function and show key features on the graph How to use a graphing calculator to graph complicated quadratics	Identify intercepts of graphs Identify intervals where the function is increasing or decreasing Identify relative maxima or minima Identify end behavior Sketch graphs of quadratics when provided key features Use interval notation to state domain and range Graph a quadratic function and show intercepts, maxima, and minima Perform transformations on quadratic graphs f(x)+k, kf(x), f(kx), f(x+k) Compare a quadratic , and/or linear function (2 functions at a time) Compare two quadratic functions that may be in different forms Solve the solutions to systems of equations approximately using technology (Include linear and quadratic) Solve a simple system of one linear equation and one quadratic equation by graphing

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Graph a quadratic function, Identify key features of a quadratic graph, Compare two quadratics given in different forms	What are the characteristics of a quadratic graph? How do transformations of quadratic functions relate to the parent function? How do you graph a quadratic function? What are the similarities and differences of two quadratic functions given in different forms?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Students understand domain and range of quadratics Identify intercepts of graph Identify intervals where the function is increasing or decreasing, positive or negative Identify relative maxima and minima Identify end behavior Sketch graphs of quadratics when provided key features Graph a quadratic function and show key features on graph Use a graphing calculator to graph complicated quadratics Graph a quadratics function and show intercepts, maxima, and minima Transformations on Quadratic graphs f(x)+k, kf(x), f(kx), and f(x+k) Compare key features of two quadratics (Both graphs, one graph/one equation, two equations, etc)

Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	**How Will it be Activated?**
Meaning of domain and range Meaning of intercepts Interval notation Know zeros and intercepts are the same Be able to evaluate expressions Graphing quadratic functions	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Domain	Minima	Gravity
Range	End Behavior	Concave up
Quadratic	Interval	Concave down
Trinomial	Intercept (x and y)	Standard form of a Quadratic
Increasing	Zeros	Translation
Decreasing	Roots	Stretch
Maxima	Axis of Symmetry	Compression

Unit Sequencing:		
Chunk 1	**Chunk 2**	**Chunk 3**
Students understand domain and range of quadratics Identify intercepts of graph Identify intervals where the function is increasing or decreasing, positive or negative Identify relative maxima and minima Identify end behavior Sketch graphs of quadratics when provided key features Use interval notation to state domain and range Relate the domain of a function to its graph and explain what this relates to in real world problems	Graph a quadratic function and show key features on graph Use a graphing calculator to graph complicated quadratics Graph a quadratics function and show intercepts, maxima, and minima Solve a system consisting of a linear equation and a quadratic equation graphically	Transformations on Quadratic graphs f(x)+k, kf(x), f(kx), and f(x+k) Compare key features of two quadratics (Both graphs, one graph/one equation, two equations, etc)

Resources/Tools

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title: Unit 7 – Solving Quadratics

Grade Level/Course: Algebra 1 | Approximate Length of Unit: 21 Days

Priority Standards	Supporting Standards
A-SSE 3.a Factor a quadratic expression to reveal the zeros of the function it defines. **A-REI 4** Solve quadratic equations in one variable. **A-REI 4.a** Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. **A-REI 4.b** Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. **F-LE 6** Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity.	**N-Q 2** Define appropriate quantities for the purpose of descriptive modeling. **N-Q 3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **A-SSE 1** Interpret expressions that represent a quantity in terms of its context. **A-SSE 2** Use the structure of an expression to identify ways to rewrite it. **F-BF 1** Write a function that describes a relationship between two quantities. **A-REI 7** Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. **A-REI 11** 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.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to apply quadratic functions to physical problems, such as the motion of an object under the force of gravity What level of accuracy for decimals to report quantities How to use the structure of an expression to identify a way to rewrite it How to write a function in equivalent forms to explain different properties	Solve quadratic equations in one variable by taking the square root or factoring Define quantities in a quadratic equation to describe a real life situation Write a function that describes a relationship between two quantities Interpret quadratic expressions in terms of context in real world problems Use completing the square to solve a quadratic Derive the quadratic formula using completing the square Solve quadratic equations that result in real number solutions by using the quadratic formula

	Use strategies of solving quadratics to reveal properties of the quadratic Use factoring and completing the square to show zeros in context Use factoring and completing the square to show maximum and minimum in context Use factoring and completing the square to show symmetry of the graph in context Create a quadratic equation Create a quadratic equation with two variables and graph Solve systems of a linear equation and quadratic equation algebraically

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Solve a quadratic equation using an appropriate method, Write a quadratic equation, Write a quadratic equation in vertex form & Identify key features	What are the four different ways to solve a quadratic equation, and when is it best to use each one? Where would you see a quadratic function modeled in real life? Why do we find the zeros of a quadratic function? How do you write a quadratic function in vertex form? How is solving a quadratic equation different than solving a linear equation?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Solve quadratic equations in one variable Solve quadratic equations by taking square roots Solve quadratic equations by factoring Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity Solve quadratic equations by using the quadratic formula (ℝ only) Use factoring and completing the square to show zeros (In context) Use factoring and completing the square to show maximum and minimum (In context) Use factoring and completing the square to show symmetry of the graph (In context)
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	How Will it be Activated?
Know the multiplication tables Meaning of zeros as intercepts Know that a square root has two solutions Know how to factor a quadratic Be able to solve for a variable Know the difference between input and output of an equation Know the rules of exponents Know maxima and minima Know how to multiply binomials Know how to solve an equation Solving quadratic equations	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Domain	Interval	Factor
Range	Intercept (x and y)	Difference of Squares
Quadratic	Zeros	Completing the Squares
Trinomial	Roots	Quadratic Formula
Maxima	Axis of Symmetry	Equivalent
Minima	Standard form of a Quadratic	

Unit Sequencing:		
Chunk 1	**Chunk 2**	**Chunk 3**
Solve quadratic equations in one variable Solve quadratic equations by taking square roots Solve quadratic equations by factoring Apply quadratic functions to physical problems, such as the motion of an object under the force of gravity Define quantities in a quadratic equation to describe a real life situation Choose a level of accuracy for decimals to report quantities Write a function that describes a relationship between two quantities Interpret quadratic expressions in terms of context in real world problems Use the structure of an expression to identify a way to rewrite it. [ex: $x^4 = (x^2)^2$]	Use completing the square to solve a quadratic Derive the quadratic formula using completing the square Solve quadratic equations by using the quadratic formula ($\mathbb{R}$ only) Use strategies of solving quadratics to reveal properties of the quadratic Use factoring and completing the square to show zeros (In context) Use factoring and completing the square to show maximum and minimum (In context) Use factoring and completing the square to show symmetry of the graph (In context) Solve a system consisting of a linear equation and a quadratic equation algebraically	Create a quadratic equation Create a quadratic equation with two variables and graph Write a function in equivalent forms to explain different properties

Resources/Tools

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title: Unit 8 – Exponentials (Graphing Calculators needed)

Grade Level/Course: Algebra 1 Approximate Length of Unit: 16 Days

Priority Standards	Supporting Standards
F-IF 1 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. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*). **F-IF 4** 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. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* [In Algebra I this standard addresses linear, **exponential**, absolute value and quadratic functions.] **F-IF 7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **F-BF 3** Identify the effect on the graph of replacing *f*(*x*) by *f*(*x*) + *k*, *kf*(*x*), *f*(*kx*), and *f*(*x* + *k*) for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* [In Algebra I this standard addresses linear, **exponential**, quadratic, and absolute value functions.]	**N-Q 2** Define appropriate quantities for the purpose of descriptive modeling. **N-Q 3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **A-SSE 1** Interpret expressions that represent a quantity in terms of its context. **A-SSE 1.b** Interpret complicated expressions by viewing one or more of their parts as a single entity. **A-SSE 2** Use the structure of an expression to identify ways to rewrite it. **A-SSE 3.c** Use the properties of exponents to transform expressions for exponential functions. **A-CED 1** Create equations and inequalities in one variable including ones with absolute value and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. [In Algebra I this standard addresses linear, exponential, and quadratic equations and inequalities] **A-CED 2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [In Algebra I this standard addresses graphing with only 2 variables] [In Algebra I this standard addresses linear, exponential, and quadratic functions] **A-REI 10** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). **F-IF 2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

	F-IF 5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. [In Algebra I this standard addresses linear, exponential, absolute value and quadratic functions.] **F-IF 7.b** Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. [In Algebra I step functions are not addressed] **F-IF 7.e** Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. [In Algebra I, this standard addresses only exponential functions] **F-IF 8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **F-IF 8.b** Use the properties of exponents to interpret expressions for exponential functions. **F-IF 9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [In Algebra I this standard addresses linear, exponential, quadratic, absolute value and piecewise defined functions.] **F-LE 1.a** Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. **F-LE 1.c** Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. **F-LE 2** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). **F-LE 3** Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. **F-BF 1** Write a function that describes a relationship between two quantities.

	F-IF 3 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 ≥ 1.* **F-BF 1.a** Determine an explicit expression, a recursive process, or steps for calculation from a context. **F-BF 2** Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to use the structure of an expression to identify a way to rewrite it The graph of an exponential is the set of all solutions That exponential growth graphs will overtake (exceed) a graph increasing linearly How to use a graphing calculator to graph complicated exponentials How to use properties of exponents to interpret expressions for exponential functions (growth and decay)	Define quantities in an exponential equation to describe a real life situation Interpret exponential expressions in terms of context in real word problems Interpret complicated expressions by viewing one part as a single entity Write a function in equivalent forms to explain different properties Understand the domain and range of exponentials Identify intercepts of graphs Indentify intervals where the function is increasing or decreasing, positive or negative Identify end behavior Sketch graphs of exponentials when provided key features Use interval notation to state domain and range Relate the domain and range of a function to its graph and explain what this relates to in real world problems Compare two exponential functions in the same or different forms Distinguish between real world problems that can be modeled with linear functions and exponential functions Construct an exponential equation when given a graph or description of the equation Graph an exponential function and show key features on the graph Perform transformations on exponential graphs [f(x)+k, kf(x), f(kx), and f(x+k)] Graph square root functions Graph cube root functions Prove that exponential function grow by equal factors over equal intervals Recognize growth or decay problems with a constant rate of change Write geometric sequences recursively Write geometric sequences explicitly

	Write an expression or recursive process from a context Construct geometric sequences given a graph Construct geometric sequences given a description of a relationship Construct geometric sequences given two input-output pairs

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Graph exponential functions Write exponential functions Apply rules & properties of exponents Transform exponential graphs Identify key features of an exponential graph Analyze growth & decay problems Compare exponential & linear functions	What are the characteristics of an exponential graph? What is the difference between a linear and an exponential function? How do you determine if a solution makes sense in context? How do you write an exponential function based on a graph, table, or word problem? How do transformations of exponential functions relate to the parent function? How do you determine if an exponential function represents growth or decay? What is the difference between arithmetic and geometric sequences? What is the difference between explicit and recursive sequences? How can you construct a sequence when given a graph, description of a relationship, or a set of input/output pairs?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Students understand domain and range of exponentials Identify intercepts of a graph Relate the domain of a function to its graph and explain how this relates to in real world problems Compare two exponential functions (May be provided in two different forms, one a graph and one a function) Graph an exponential function and show key features on graph Create a simple exponential equation and solve Transformations on Exponential graphs $f(x)+k$ and $f(x+k)$ and $-f(x)$ Identify the function as growth or decay
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	**How Will it be Activated?**
Know decimal place values Know the rules of exponents Know the definition of a power as having a base and exponent Be able to solve multistep equation Meaning of domain and range Meaning of intercepts Know interval notation Be able to evaluate expressions Know parent functions for exponentials Properties of exponents	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Power	Decreasing	Sequence
Base	Intercept (x and y)	Series
Exponent	Interval	Arithmetic
Exponential	Domain	Geometric
Growth	Range	Input
Decay	Transformation	Output
Principle	End Behavior	Recursive
Interest	Translation	Explicit
Compound Interest	Stretch	Terms
Increasing	Compression	

Unit Sequencing:		
Chunk 1	**Chunk 2**	**Chunk 3**
Interpret complicated expressions by viewing one part as a single entity Use structure of an expression to rewrite it Create an exponential equation	Students understand domain and range of exponentials Identify intercepts of graphs Identify intervals where the function is increasing or decreasing, positive or negative Identify end behavior Relate the domain of a function to its graph and explain what this relates to in real world problems Prove that exponential functions grow by equal factors over equal intervals Recognize growth or decay problems with a constant rate of change	Graph an exponential function and show key features on the graph Graph square root functions Graph cube root functions
Chunk 4	**Chunk 5**	**Chunk 6**
Use a graphing calculator to graph complicated exponentials Write functions in equivalent forms to explain different properties Compare two exponential functions Transformations on exponential graphs Use properties of exponents to interpret expressions for exponential functions	Create an exponential equation with two variables and graph Define quantities in an exponential equation to describe a real life situation Interpret exponential expressions in terms of context in real world problems	Distinguish between real world problems that can be modeled with linear functions and exponential functions Observe that exponential growth graphs will overtake a graph increasing linearly Write a function that describes a relationship between two quantities (linear, quadratic, or exponential)
Chunk 7		
Write geometric sequences recursively Write geometric sequences explicitly		

Resources/Tools
Patty paper Graph paper Graphing calculators

Reflection on Best Practices (Feedback Loop)

CJUSD Secondary Math Unit Outline

Unit Title: Unit 9 – Interpreting Data

Grade Level/Course: Algebra 1 Approximate Length of Unit: 17 Days

Priority Standards	Supporting Standards
F-IF 6 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. **S-ID 6.a** Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.* **S-ID 6.c** Fit a linear function for a scatter plot that suggests a linear association.	**N-Q 3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **A-SSE 1** Interpret expressions that represent a quantity in terms of its context. **F-IF 1** 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. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. **F-IF 4** 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. [In Algebra I this standard addresses linear, exponential, absolute value and quadratic functions.] **F-IF 5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes [I^n Algebra I this standard addresses linear, exponential, absolute value and quadratic functions.] **F-IF 9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [In Algebra I this standard addresses linear, exponential, quadratic, absolute value and piecewise defined functions.] **S-ID 2** 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. **S-ID 3** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

	S-ID 5 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). Recognize possible associations and trends in the data. **S-ID 6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. **S-ID 6.b** Informally assess the fit of a function by plotting and analyzing residuals. **S-ID 7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. **S-ID 8** Compute (using technology) and interpret the correlation coefficient of a linear fit. **S-ID 9** Distinguish between correlation and causation.

What do students have to know and be able to do in order to meet the targeted standards?	
Students will know:	*Students will be able to do:*
How to choose a level of accuracy for decimals to report quantities How to find the domain and range of functions How to interpret key information from a graph or table How to relate domain of a function to a graph How to informally assess the fit of a function by plotting and analyzing residuals How to interpret the slope and the intercept of a linear model in the context of the data (Review)	Interpret expressions in terms of context in real world problems Use stats to compare median, mean, interquartile range, and/or standard deviation in two or more different data sets Represent data with plots on the real number line (dot plots, histograms, and box plots) Interpret differences in shape, center, and spread of data sets to account for outliers Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, & conditional relative frequencies). Recognize possible associations & trends in the data. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related Compare data represented in a different ways (algebraically, graphically, tables, or verbal) Fit a function to the data (Linear, Quadratic, and exponential) Compute (using technology) and interpret the correlation coefficient of a linear fit Distinguish between correlation and causation

Big Ideas/Essential Understanding:	**Essential/Guiding Questions:**
Analyze & interpret data Represent data using box plots, histograms, dot plots, frequency tables, & scatter plots Calculate measures of central tendency Identify the curve of best fit for a set of data	How do you determine if a set of data is valid? What conclusions can you draw from a set of data? What are the differences between the ways to represent data visually & when is it best to use each one? How do you calculate the measures of central tendency & what do they say about the data? How do you determine the curve of best fit for a set of data? How does the curve of best fit help you predict results?

Summative/ End of Unit Assessment Blueprint (Include question item types)	Use stats to compare median in two or more different data sets Use stats to compare mean in two or more different data sets Use stats to compare interquartile range in two or more different data sets Use stats to compare standard deviation in two or more different data sets Represent data with plots on the real number line (dot plots, histograms, and box plots) Calculate and interpret the average rate of change from a graph Fit a linear function for a scatter plot that suggests a linear association
Summative/ End of Unit Performance Task	

Scoring Criteria for Assessment	Single point items and rubric based scoring.
Scoring Criteria for Performance Task	Rubric based scoring.

What Prior Knowledge Should be Activated?	**How Will it be Activated?**
Decimal place value Rounding decimals Vocabulary: median, mean, interquartile range Identify domain and range of a function Plotting numbers on a number line Familiarity with scatter plots Familiarity with tables Familiarity with various graphs Slope Linear, quadratic, and exponential functions Familiarity with technology tools (i.e. graphing calc)	Warm-ups Guided practice "I do, you do" Think pair share Whole class discussion

Key Vocabulary		
Domain	Mean	Linear Function
Range	Interquartile Range	Quadratic Function
Average Rate of Change	Standard Deviation	Exponential Function
Slope	Variance	Correlation
Real Number Line	Outlier	Causation
Dot Plot	Joint Frequency	Correlation Coefficient
Histogram	Marginal Frequency	Curve of Best Fit
Box Plot	Conditional Relative Frequency	Line of Best Fit
Median	Scatter Plot	Residual

Unit Sequencing:		
Chunk 0	**Chunk 1**	**Chunk 2**
Choose a level of accuracy for decimals to report quantities Interpret expressions in terms of context in real world problems	Use stats to compare median in two or more different data sets Use stats to compare mean in two or more different data sets	Use stats to compare interquartile range in two or more different data sets Use stats to compare standard deviation in two or more different data sets
Chunk 3	**Chunk 4**	**Chunk 5**
Students understand domain and range of functions Represent data with plots on the real number line (dot plots, histograms, and box plots) Interpret differences in shape, center, and spread of data sets to account for outliers Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, & conditional relative frequencies). Recognize possible associations & trends in the data. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related	Interpret key information from a graph or table Relate domain of a function to a graph Calculate and interpret the average rate of change from a graph Compare data represented in a different ways (algebraically, graphically, tables, or verbal) Fit a function to the data (Linear, Quadratic, and exponential) Informally assess the fit of a function by plotting and analyzing residuals Fit a linear function for a scatter plot that suggests a linear association Interpret the slope and the intercept of a linear model in the context of the data (Review)	Compute (using technology) and interpret the correlation coefficient of a linear fit Distinguish between correlation and causation

Resources/Tools

Reflection on Best Practices (Feedback Loop)

Learning Experiences and Instruction:
Teachers utilize the Direct Interactive Instruction model to introduce new skills and concepts that are essential to the grade level content standards, then reinforce and develop those skills each quarter with the goal of bringing students to mastery by the end of the fourth quarter. All instruction will be based on the "I do, We do, You do" scaffolding model with an emphasis on individual differentiation as needed. Teachers will use a variety of the following:

- Inquiry-based learning
- Engaged reading opportunities
- Think-pair-share
- Reciprocal teaching
- Cloze reading & writing
- Guided reading & writing
- Cognitive modeling
- Questioning strategies
- Graphic organizers/concept attainment
- Student-led groups
- Peer pairing
- Metacognitive learning: self-regulation, goal-setting, self-monitoring, and self-questioning
- Word wall
- Direct instruction
- Guided practice
- Inquiry learning
- Independent practice
- Examples and non-examples
- Multimedia lessons
- Checking for understanding

Support for English Language Learners:
Extra time or modified versions of assignments will be given. The District will provide a language assistant. Additional strategies will be developed through the Response to Intervention plans –such as:

- SDAIE strategies
- Texts/materials in first language.
- Flexible grouping
- Structured engagement
- Peer pairing
- Academic vocabulary development
- Realia
- Spanish-English glossary

Support for Special Education Students:
Extra time or modified versions of assignments will be given. The District will provide an instructional assistant. Additional strategies will be developed through the Individual Education Plan process – such as:

- Realia
- Texts/materials in first language
- SDAIE strategies
- Flexible grouping
- Peer pairing
- Audio & visual aids
- Individualized academic instruction
- Modified assignments
- Modified texts
- Testing accommodations
- Tutoring (peer & teacher)

Stretching the Lesson for GATE Students:
Differentiated curriculum will be provided to challenge the student and provide the student with opportunities to develop their identified talent. Teachers will use a variety of the following:

- Independent study supplemented with mentoring/tutoring
- Compacting
- Acceleration
- Depth & Complexity icons
- Modified texts
- Modified assignments
- Flexible grouping
- Inquiry-based Learning
- Enriched materials and learning experiences

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