1	Quantities and Relationships	This chapter introduces students to the concept of functions. Lessons provide opportunities for students to explore functions, including linear, exponential, quadratic, linear absolute value functions,and linear piecewise functions through problem situations, graphs, and equations. Students will classify each function family using graphs, equations, and graphing calculators. Each function family is then defined and students will create graphic organizers that represent the graphical behavior and examples of each.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
1.1	A Picture is Worth a Thousand Words Understanding Quantities and Their Relationships	• Understand quantities and their relationships with each other. • Identify the independent and dependent quantities for a problem situation. • Match a graph with an appropriate problem situation. • Label the independent and dependent quantities on a graph. • Review and analyze graphs. • Describe similarities and differences among graphs.	N.Q.2 F.LE.1.b	•Dependent quantity •Independent quantity	•				
1.2	A Sort of Sorts Analyzing and Sorting Graphs	• Review and analyze graphs. • Determine similarities and differences among various graphs. • Sort graphs by their similarities and rationalize the differences between the groups of graphs. • Use the Vertical Line Test to determine if the graph of a relation is a function.	F.IF.1 F.IF.5	•Relation •Domain •Range •Function •Vertical Line Test •Discrete graph •Continuous graph			•		
1.3	There Are Many Ways to Represent Functions Recognizing Algebraic and Graphical Representations of Functions	• Write equations using function notation. • Recognize multiple representations of functions. • Determine and recognize characteristics of functions. • Determine and recognize characteristics of function families.	F.IF.5 F.IF.9 A.REI.10 F.IF.1 F.IF.2 F.IF.7.a	•Function notation •Increasing function •Decreasing function •Constant function •Function family •Linear functions •Exponential functions •Absolute minumum •Absolute maximum •Quadratic functions •Linear absolute value functions •Linear piecewise functions		•			•

1.4	Function Families for 200, Alex … Recognizing Functions by Characteristics	•Recognizing similar characteristics among function families. •Recognize different characteristics among function families. •Determine function types given certain characteristics.	F.IF.1 F.IF.4 F.IF.7.a F.IF.9 F.LE.1.b F.LE.2 A.CED.2	N/A	•			•	

2	Graphs, Equations & Inequalities	This chapter reviews solving linear equations and inequalities with an emphasis towards connecting the numeric, graphic, and algebraic methods for solving linear functions. Students explore the advantages and limitations of using tables, functions, and graphs to solve problems. A graphical method for solving linear equations, which involves graphing the left and right side of a linear equation, is introduced. Upon student understanding of solving and graphing equations by hand, the chapter introduces the use of a graphing calculator. Finally, the graphical method for solving problems is extended to include non-linear equations and inequalities.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
2.1	The Plane! Modeling Linear Situations	• Complete tables and graphs, and write equations to model linear situations. • Analyze multiple representations of linear relationships. • Identify units of measure associated with linear relationships. • Determine solutions both graphically and algebraically. • Determine solutions to linear functions using intersection points.	A.REI.1 A.REI.3 A.REI.10 A.CED.1 A.CED.2 N.Q.1 A.SSE.1.a F.IF.2 F.IF.6	•First differences •Solution •Point of intersection	•	•	•	•	
2.2	What Goes Up Must Come Down Analyzing Linear Functions	• Complete tables and graphs, and write equations to model linear situations. • Analyze multiple representations of linear relationships. • Identify units of measure associated with linear relationships. • Determine solutions to linear functions using intersection points and properties of equality. • Determine solutions using tables, graphs, and functions. • Compare and contrast different problem-solving methods. • Estimate solutions to linear functions. • Use a graphing calculator to analyze functions and their graphs.	A.REI.3 A.CED.1 A.CED.2 N.Q.1 A.SSE.1.a A.REI.10 N.Q.3 F.IF.2 F.IF.6	N/A			•		•
2.3	Scouting for Prizes Modeling Linear Inequalities	•Write and solve inequalities. •Analyze a graph on a coordinate plane to solve problems involving inequalities. •Interpret how a negative rate affects how to solve an inequality.	A.CED.1 A.CED.2 A.CED.3 A.REI.3 A.REI.10 N.Q.3	•Solve an inequality		•		•	
2.4	We're Shipping Out Solving and Graphing Compound Inequalities	• Write simple and compound inequalities. • Graph compound inequalities. • Solve compound inequalities.	A.CED.1 A.CED.2 A.REI.3	•Compound inequality •Solution of a compound inequality •Conjunction •Disjunction		•			

2.5	Play Ball! Absolute Value Equations and Inequalities	• Understand and solve absolute values. • Solve linear absolute value equations. • Solve and graph linear absolute value inequalities on number lines. • Graph linear absolute values and use the graph to determine solutions.	A.CED.1 A.CED.2 A.CED.3 A.REI.3 A.REI.10	•Opposites •Absolute value •Linear absolute value equation •Linear absolute value inequality •Equivalent compound inequality	•	•	•	•	•
2.6	Choose Wisely! Understanding Non-Linear Graphs and Inequalities	• Identify the appropriate function to represent a problem situation. • Determine solutions to linear functions using intersection points. • Determine solutions to non-linear functions using intersection points. • Describe advantages and disadvantages of using technology different methods to solve functions with and without technology.	N.Q.1 N.Q.2 A.CED.2 A.CED.3 A.REI.10 F.IF.2 F.LE.1.b F.LE.1.c	N/A				•	

3	Linear Functions	This chapter guides student exploration and comprehension of different forms of linear equations. Questions ask students to compare the mathematical and contextual meanings of various linear equations and to determine when to use the most appropriate form of a linear equation to represent a problem situation.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
3.1	Is It Getting Hot in Here? Modeling Data Using Linear Regression	• Create a graph of data points on a graphing calculator. • Determine a linear regression equation using a graphing calculator. • Recognize the accuracy of a line of best fit using the correlation coefficient. • Make predictions about data using a linear regression equation.	S.ID.6 S.ID.7 N.Q.2 A.REI.3	•Linear regression •Line of best fit •Linear regression equation •Significant digits •Correlation coefficient					•
3.2	Tickets for Sale Standard Form of Linear Equations	• Identify contextual meaning of expressions in an function. • Write equations in standard form. • Solve equations in standard form. • Determine the x-intercept and y-intercept of an equation in standard form. • Use intercepts to graph an equation. • Convert equations from standard form to slope-intercept form. • Solve equations in slope-intercept form. • Determine the x-intercept and y-intercept of an equation in slope-intercept form. • Perform unit analysis of equations.	A.SSE.1.a A.SSE.1.b A.CED.2 A.CED.3 A.CED.4 A.REI.3 N.Q.2 F.IF.2	•Standard form •Slope-intercept form	•	•	•	•	•
3.3	Cool As a Cucumber or Hot Like a Tamale! Literal Equations in Standard Form and Slope-Intercept Form	• Recognize and use literal equations. • Convert literal equations to highlight a specific variable. • Convert between standard and slope-intercept form. • Recognize the value of standard and slope-intercept form.	A.CED.2 A.CED.4 A.REI.1	•Literal equation			•		
3.4	A Growing Business Combining Linear Equations	• Write linear functions using the Distributive Property. • Write and analyze a linear function as a combination of multiple linear functions. • Interpret and understand component parts of functions. • Analyze problem situations modeled by a combination of multiple linear functions.	A.SSE.1.a A.SSE.1.b A.CED.2 A.CED.3 A.REI.3	N/A	•		•		

4	Sequences	This chapter introduces students to sequences, and then focuses student attention on arithmetic and geometric sequences. Students then use recursive and explicit formulas to determine subsequent terms of a sequence. The relationship between arithmetic sequences and linear functions and some geometric sequences and exponential functions is developed.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
4.1	Is There a Pattern Here? Recognizing Patterns and Sequences	•Recognize patterns. •Describe patterns. •Represent patterns as sequences. •Predict the next term in a sequence.	F.LE.1.b F.LE.2	•Sequence •Term of a sequence •Infinite sequence •Finite sequence	•		•		
4.2	The Password Is … Operations! Arithmetic and Geometric Sequences	•Determine the next term in a sequence. •Recognize arithmetic sequences. •Determine the common difference. •Recognize geometric sequences. •Determine the common ratio.	F.BF.1.a	•Arithmetic sequence •Common difference •Geometric sequence •Common ratio		•	•		
4.3	The Power of Algebra is a Curious Thing Using Formulas to Determine Terms of a Sequence	•Write an explicit formula for arithmetic and geometric formulas. •Write a recursive formula for arithmetic and geometric formulas. •Use formulas to determine unknown terms of a sequence.	F.BF.1 F.BF.1.a F.BF.2 A.SSE.1 A.SSE.1.a	•Index •Explicit formula •Recursive formula	•	•			•
4.4	Thank Goodness Descartes Didn't Drink Some Warm Milk! Graphs of Sequences	•Graph arithmetic sequences. •Graph geometric sequences. •Recognize graphical behavior of sequences. •Sort sequences that are represented graphically.	F.IF.1 F.IF.4 F.LE.2	N/A	•				

4.5	Well, Maybe It IS a Function! Sequences and Functions	• Write an arithmetic sequence as a linear function. • Make the connection between the graph of an arithmetic sequence, and the graph of a linear function. • Write a geometric sequence as an exponential function. • Make the connection between the graph of a geometric sequence, and the graph of an exponential function. • Contrast an exponential function and a geometric sequence with a negative common ratio.	F.IF.1 F.IF.2 F.IF.3 F.BF.1 F.BF.2 F.LE.1 F.LE.1.a F.LE.1.b F.LE.1.c F.LE.2 F.LE.5	N/A	•	•	•	•	

5	Exponential Functions	This chapter examines the graphical behavior of exponential functions, including intercepts, domain and range, intervals of increase or decrease, and asymptotes. Students also explore the transformations of exponential functions. The chapter then introduces students to the relationship between rational exponents and radical form. Students will learn the strategy to use common bases to solve simple exponential equations algebraically.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
5.1	Go for the Curve! Comparing Linear and Exponential Functions	• Construct and identify linear and exponential functions from sequences. • Compare graphs, tables, and equations of linear and exponential functions. • Construct a linear function from an arithmetic sequence. • Construct an exponential function from a geometric sequence. • Compare formulas for simple interest and compound interest.	A.SSE.1.a A.SSE.1.b A.CED.1 F.IF.3 F.IF.6 F.IF.7.e F.BF.1.a F.BF.2 F.LE.1.a F.LE.1.b F.LE.1.c F.LE.2 F.LE.3 F.LE.5	•Simple interest •Compound interest		•		•	•
5.2	Downtown and Uptown Graphs of Exponential Functions	• Solve exponential functions using the intersection of graphs. • Analyze asymptotes of exponential functions and their meanings in context. • Identify the domain and range of exponential functions. • Analyze and graph decreasing exponential functions. • Compare graphs of linear and exponential functions through intercepts, asymptotes, and end behavior.	A.SSE.1.a A.SSE.1.b A.CED.1 A.REI.11 F.IF.4 F.IF.7.e F.LE.5 F.LE.2	•Horizontal asymptote					•

5.3	Let the Transformations Begin! Translations of Linear and Exponential Functions	•Translate linear and exponential functions vertically. •Translate linear and exponential functions horizontally.	F.BF.3 A.REI.10 F.LE.2	•Basic function •Transformation •Vertical translation •Coordinate notation •Horizontal translation •Argument of a function			•	•	•
5.4	Take Some Time to Reflect Reflections of Linear and Exponential Functions	• Reflect linear and exponential functions vertically. • Reflect linear and exponential functions horizontally. • Determine characteristics of graphs after transformations.	F.IF.4 A.REI.10 F.LE.2	•Reflection •Line of reflection			•		•
5.5	Radical! Because It's Cliché! Properties of Rational Exponents	• Simplify expressions with negative exponents. • Simplify expressions with rational exponents. • Write negative powers as positive powers. • Write rational powers using radicals. • Find the nth root of a number. • Write an expression in radical form.	N.RN.1 N.RN.2	•Cube root •Index •nth root •Radicand •Rational exponent		•			

5.6	Checkmate! Solving Exponential Functions	• Use multiple representations to model exponential functions. • Understand the properties of exponent expressions with positive and negative exponents. • Solve exponential functions graphically and algebraically using common bases and properties of exponents. • Investigate increasing and decreasing exponential functions. • Model inequalities in exponential situations. • Use technology to graph, analyze, and solve exponential functions.	A.REI.3 A.CED.1 A.CED.2 N.Q.2 A.REI.10 A.REI.11 N.RN.2 F.LE.2	N/A		•	•		

6	Systems of Equations	This chapter focuses on solving systems of linear equations graphically and algebraically using the substitution method of the linear combinations method.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
6.1	Prepping for the Robot Challenge Solving Linear Systems Graphically and Algebraically	• Write systems of linear equations. • Graph systems of linear equations. • Determine the intersection point, or break-even point, from a graph. • Use the substitution method to determine the intersection point. • Understand that systems of equations can have one, zero, or infinite solutions.	A.REI.5 A.REI.6 A.REI.10 A.REI.11	•System of linear equations •Break-even point •Substitution method •Consistent systems •Inconsistent systems		•	•	•	
6.2	There's Another Way? Using Linear Combinations to Solve a Linear System	• Write a system of equations to represent a problem context. • Solve a system of equations algebraically using linear combinations (elimination).	A.REI.5 A.REI.6 A.REI.10 A.REI.11	•Linear combinations method		•			
6.3	What's For Lunch? Solving More Systems	• Write a linear system of equations to represent a problem context. • Solve a linear system of equations using the linear combinations method.	A.REI.5 A.REI.6 A.REI.10 A.REI.11	N/A			•	•	
6.4	Which is the Best Method? Using Graphing, Substitution, and Linear Combinations	• Use various methods of solving systems of linear equations to determine the better paying job. • Use various methods of solving systems of linear equations to determine the better buy.	A.REI.6 A.REI.10 A.REI.11	N/A					

7	Systems of Inequalities				Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	Lesson Title	Key Math Objective	CCSS	Key Terms					
7.1	The Playoffs Graphing Inequalities	•Write an inequality in two variables. •Graph an inequality in two variables. •Determine which type of line on a graph represents a given inequality. •Interpret the solutions of inequalities mathematically and contextually.	A.REI.12 A.CED.3	•Half-plane					
7.2	Working the System Sustems of Linear Inequalities	• Write and graph systems of linear inequalities. • Determine solutions to systems of linear inequalities. • Algebraically prove solutions and non-solutions of systems of linear inequalities. • Graph systems of linear inequalities using a graphing calculator.	A.REI.12 A.CED.3	• Constraints • Solution of a system of linear inequalities			•		•
7.3	Our Biggest Sale of the Season! Systems with More Than Two Linear Inequalities	•Solve systems of linear inequalities. •Mazimize linear expressions on a region in the coordinate plane.	A.REI.12 A.CED.3	N/A			•		
7.4	Take It to the Max … or Min	• Write systems of inequalities with more than two inequalities. • Determine constraints from a problem situation. • Graph systems of linear inequalities and determine the solution set. • Identify the maximum and minimum values of a linear expression.	A.REI.12 A.CED.3	•Linear programming		•	•		

8	Analyzing Data Sets for One Variable	This chapter reviews data analysis of data sets with one variable. Students first learn to represent data graphically through dot plots, histograms, and box-and-whisker plots. The chapter leads students to determining measures of center for a data set, determining any outliers in a data set, and determining the interquartile range (IQR) and standard deviation for data sets.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
8.1	Start Your Day the Right Way Graphically Representing Data	• Represent and interpret data displayed on dot plots. • Represent and interpret data displayed on histograms. • Represent and interpret data displayed on box-and-whisker plots.	S.ID.1	•Dot plot •Discrete data •Data distribution •Symmetric distribution •Skewed right distribution •Skewed left distribution •Box-and-whisker plot •Five number summary •Histogram •Bin •Frequency •Continuous data		•	•	•	
8.2	Which Measure Is Better? Determining the Best Measure of Center for a Data Set	• Calculate and interpret the mean of a data set. • Calculate and interpret the median of a data set. • Estimate the mean and median of a data set from its data distribution. • Determine which measure of central tendency (mean or median) is best to use for a data set.	S.ID.1 S.ID.2 S.ID.3	• Statistic • Measure of central tendency		•		•	•

8.3	You Are Too Far Away! Calculating IQR and Identifying Outliers	•Calculate and interpret the interquartile range (IQR) of a data set. •Determine if a data set contains outliers.	S.ID.1 S.ID.2 S.ID.3	•Interquartile range (IQR) •Outlier •Lower fence •Upper fence		•	•	•	
8.4	Whose Scores Are Better? Calculating and Interpreting Standard Deviation	• Calculate and interpret the standard deviation of a data set. • Compare the standard deviation of data sets.	S.ID.1 S.ID.2 S.ID.3	•Standard deviation •Normal distribution	•	•		•	•
8.5	Putting the Pieces Together Analyzing and Interpreting Data	•Analyze and interpret data graphically and numerically. •Determine which measure of central tendency and spread is most appropriate to describe a data set.	S.ID.1 S.ID.2 S.ID.3	•Stem-and-leaf plot •Side-by-side stem-and-leaf plot			•	•	

9	Correlation and Residuals	This chapter introduces the method of least squares to determine a linear regression line of a data set. The chapter then progresses to provide opportunities to determine the correlation coefficient of a data set by both pencil-and paper and by using a graphing calculator. Then the chapter exposes students to residuals of a data set in which they will make determinations about which function type might be represent a data set. Finally, the chapter introduces students to causation and correlation.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
9.1	Like a Glove Least Squares Regression	• Determine and interpret the least squares regression equation for a data set using a formula. • Use interpolation to make predictions about data. • Use extrapolation to make predictions about data.	S.ID.6.a S.ID.6.c S.ID.7	•Interpolation •Extrapolation •Least squares regression line		•	•	•	
9.2	Gotta Keep It Correlatin' Correlation	•Determine the correlation coefficient using a formula. •Interpret the correlation coefficient for a set of data.	S.ID.6.a S.ID.6.c S.ID.7 S.ID.8	N/A		•			•
9.3	The Residual Effect Creating Residual Plots	•Create residual plots. •Analyze the shapes of residual plots.	S.ID.6.a S.ID.6.b S.ID.7 S.ID.8	•Residual •Residual plot			•	•	
9.4	To Fit or Not To Fit? That Is The Question! Using Residual Plots	• Use scatter plots and correlation coefficients to determine whether a linear regression is a good fit for data. • Use residual plots to help determine whether a linear regression is the best fit for data.	S.ID.6.a S.ID.6.b S.ID.7 S.ID.8	N/A				•	•

9.5	Who Are You? Who? Who? Causation vs. Correlation	• Understand the difference between correlation and causation. • Understand necessary conditions. • Understand sufficient conditions.	S.ID.9	• Causation • Necessary condition • Sufficient condition • Common response • Confounding variable				•	

10	Analyzing Data Sets for Two Categotical Variables	This chapter introduces categorical data as opposed to numerical data students have encountered in the previous two chapters. Students learn how to organize data from a data table, determine the relative frequency distributions of a data set, determine the relative frequency conditional distribution, and finally to analyze categorical data to problemsolve and make decisions.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
10.1	Could You Participate in Our Survey? Interpreting Frequency Distributions	• Construct and interpret frequency and frequency marginal distributions displayed in two-way tables for two-variable categorical data. • Create and interpret graphs of frequency distributions displayed in two-way tables.	S.ID.5	• Categorical data • Two-way frequency table • Frequency distribution • Joint frequency • Frequency marginal distribution	•				
10.2	It's So Hot Outside! Relative Frequency Distribution	• Construct and interpret relative frequency distribution and relative frequency marginal distributions displayed in two-way tables for categorical data. • Analyze and use relative frequency marginal distributions to make decisions for a problem situation.	S.ID.5	• Relative frequency distribution • Relative frewuency marginal distribution			•		
10.3	She Blinded Me with Science! Relative Frequency Conditional Distribution	•Construct and interpret relative frequency conditional distributions displayed in two-way tables for categorical data.	S.ID.5	• Relative frequency conditional distribution			•		
10.4	Oh! Switch the Station! Drawing Conclusions from Data	•Analyze different categorical data. •Use categorical data to make decisions.	S.ID.5	N/A					

11	Introduction to Quadratic Functions	This chapter examines the graphical behavior of quadratic functions, including domain, range, increasing and decreasing, absolute maximum and absolute minimum, symmetry, and zeros. The relationship between the form of a quadratic function and the graph of a quadratic function is discussed, especially the key graphical characteristics identified from the form of the quadratic function. Transformations and dilations of quadratic functions are explored.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
11.1	Up and Down or Down and Up Exploring Quadratic Functions	• Model real-world problems using quadratic functions. • Analyze tables, graphs, and equations for quadratic functions. • Use the Distributive Property to write a quadratic equation in standard form. • Compare graphs of quadratic functions. • Use a graphing calculator to determine the absolute minimum or absolute maximum of a quadratic function.	A.CED.1 A.CED.2 F.IF.4	•Standard form (general form) of a quadratic function •Parabola	•	•		•	•
11.2	Just U and I Comparing Linear and Quadratic Functions	• Identify linear and quadratic functions from multiple representations. • Compare graphs, tables, and equations for linear and quadratic functions. • Analyze graphs of linear and quadratic functions. • Determine if a function is linear or quadratic by analyzing the first and second differences	A.SSE.1 A.CED.1 A.CED.2 F.IF.4 F.IF.6 F.LE.1.a	•Leading coefficient •Second differences				•	

11.3	Walking the … Curve? Domain, Range, Zeros, and Intercepts	• Describe the domain and range of quadratic functions. • Determine the x-intercept(s) of a graph of a quadratic function. • Understand the relationship of the zeros of a quadratic function and the x-intercepts of its graph. • Analyze quadratic functions to determine intervals of increase and decrease. • Solve a quadratic function graphically.	A.SSE.1 A.CED.1 A.CED.2 F.IF.4 F.IF.5 F.IF.7a	• Vertical motion model • Zeros • Interval • Open interval • Closed interval • Half-closed interval • Half-open interval		•			•
11.4	Are You Afraid of Ghosts? Factored Form of a Quadratic Function	• Factor the greatest common factor from an expression. • Write a quadratic function in factored form. • Determine the x-intercepts from a quadratic function written in factored form. • Determine an equation of a quadratic function given its x-intercepts.	A.SSE.1.a A.SSE.3.a A.CED.1 A.CED.2 F.IF.4 F.IF.7a	•Factor an expression •Factored form		•	•		•
11.5	Just Watch That Pumpkin Fly! Investigating the Vertex of a Quadratic Function	• Interpret parts of a quadratic function in terms of a problem situation. • Use a calculator to determine the x-intercept(s), y-intercept, and absolute maximum or minimum of a quadratic function. • Solve a quadratic function graphically. • Determine the vertex of a quadratic function. • Use symmetric points to determine the location of the vertex of a parabola. • Use the vertex to determine symmetric points on a parabola.	A.SSE.1.a F.IF.4 F.IF.7a	•Vertex •Axis of symmetry				•	•

11.6	The Form is "Key" Vertex Form of a Quadratic Function	• Determine key characteristics of parabolas using a graphing calculator. • Determine key characteristics of parabolas given their equations in standard form. • Determine key characteristics of parabolas given their equations in factored form. • Determine key characteristics of parabolas given their equations in vertex form. • Write equations of parabolas given key characteristics of their graphs.	A.SSE.1.a F.IF.4 F.IF.7.a	•Vertex form			•	•	•
11.7	More Than Meets the Eye Transformations of Quadratic Functions	• Translate quadratic functions. • Reflect quadratic functions. • Dilate quadratic functions. • Write equations of quadratic functions given multiple transformations. • Graph quadratic functions given multiple transformations. • Identify multiple transformations given equations of quadratic functions.	F.BF.3 F.IF.7a	•Vertical dilation •Dilation factor					•

12	Polynomials and Quadratics	This chapter introduces operations with polynomials, including factoring quadratic trinomials. Quadratic equations are solved graphically, by factoring, and by completing the square.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
12.1	Controlling the Population Adding and Subtracting Polynomials	• Recognize polynomial expressions. • Identify monomials, binomials, and trinomials. • Identify the degree of a term and the degree of a polynomial. • Write polynomial expressions in standard form. • Add and subtract polynomial expressions. • Graph polynomial functions and understand the connection between the graph of the solution and the algebraic solution.	A.SSE.1.a A.APR.1 A.CED.1 F.BF.1.b A.CED.2	• Polynomial • Term • Coefficient • Monomial • Binomial • Trinomial • Degree of a term • Degree of a polynomial		•	•		•
12.2	They're Multiplying - Like Polynomials! Multiplying Polynomials	• Model the multiplication of a binomial by a binomial using algebra tiles. • Use multiplication tables to multiply binomials. • Use the Distributive Property to multiply polynomials.	A.APR.1	N/A	•	•	•		•
12.3	What Factored Into It? Factoring Polynomials	• Factor polynomials by determining the greatest common factor. • Factor polynomials by using multiplication tables.	A.SSE.3.a A.APR.1	N/A		•	•	•	
12.4	Zeroing In Solving Quadratics by Factoring	• Solve quadratic equations and functions using factoring. • Connect the zeros of a function to the x-intercepts of a graph. • Determine the roots of quadratic equations.	A.SSE.3.a A.REI.4.b	• Zero Product Property • Converse of Multiplication Property of Zero • Roots	•	•			

12.5	What Makes You So Special? Special Products	• Identify and factor the difference of two squares. • Identify and factor perfect square trinomials. • Solve quadratic equations and functions using factoring. • Identify and factor the difference of two cubes. • Identify and factor the sum of cubes.	A.SSE.2 A.SSE.3.a	• Difference of two squares • Perfect square trinomial • Difference of two cubes • Sum of two cubes			•	•	
12.6	Could It Be Groovy to Be a Square? Approximating and Rewriting Radicals	• Determine the square root of perfect squares. • Determine the approximate square root of given values. • Determine the exact value of a square root of given values. • Rewrite radicals by extracting perfect squares.	N.RN.2 A.CED.1 A.REI.4.b	•Square root •Positive square root •Principal square root •Negative square root •Extract the square root •Radical expression •Radicand		•	•		
12.7	Another Method Completing the Square	• Determine the roots of a quadratic equation by completing the square. • Complete the square geometrically and algebraically.	A.SSE.3.b A.REI.4.b	•Completing the square	•	•			

13	Solving Quadratic Equations and Inequalities	This chapter introduces the quadratic formula and emphasizes choosing an appropriate method to solve quadratic equations. Quadratic inequalities are solved using a coordinate plane, and then an algebraic strategy is introduced. Systems of equations involving one or more quadratic equations are solved.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
13.1	Ladies and Gentlemen: Please Welcome the Quadratic Formula! The Quadratic Formula	• Use the Quadratic Formula to determine roots and zeros. • Derive the Quadratic Formula from a quadratic equation written in standard form. • Use the discriminant of a Quadratic Formula to determine the number of roots or zeros. • Determine the most efficient method of calculating roots or zeros.	A.CED.1 A.CED.2 A.REI.4.a A.REI.4.b	•Quadratic Formula •Discriminant		•	•		•
13.2	It's Watching and Tracking! Using a Calculator-Based Ranger to Model Quadratic Motion	• Predict the graph of a ball being tossed. • Use a calculator-based ranger (CBR) to graph the trajectory of an item. • Attempt to replicate a trajectory that is very similar to the graph of a quadratic function.	A.REI.4.b F.IF.7.a	•Quadratic regression •Coefficient of determination					•
13.3	They're a Lot More Than Just Sparklers! Solving Quadratic Inequalities	•Use the Quadratic Formula to solve quadratic inequalities.	A.CED.1 A.CED.2 A.REI.4.b	N/A		•	•		
13.4	You Must Have a System Systems of Quadratic Equations	•Solve systems of a linear equation and a quadratic equation. •Solve systems of two quadratic equations.	A.REI.7 A.CED.1 A.CED.2	N/A	•				

14	Real Number System	This chapter begins by reviewing the real number system and then move to introducing the imaginary and ultimately the complex number system. Using the powers of exponents rules, students discover the necessity of the number i. This discovery leads to students exploring whether quadratic functions have one, two, or no real roots.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
14.1	The Real Numbers … For Realsies! The Numbers of the Real Number System	• Define sets of natural numbers, whole numbers, integers, rational numbers, irrational numbers, and real numbers. • Determine under which operations different sets of number are closed. • Create a Venn diagram to show how different number sets are related. • Determine which equations can be solved using different number sets. • Write repeating decimals as fractions.	N.RN.3	• Natural numbers • Whole numbers • Closed (closure) • Counterexample • Integers • Rational numbers • Irrational numbers • Real numbers • Venn diagram	•	•	•		
14.2	Getting Real, and Knowing How … Real Number Properties	• Learn set notation. • Make statements about real number properties using set notation. • Identify the properties of the real number system including: commutative, associative, distributive, additive identity, multiplicative identity, additive inverse, and multiplicative inverse.	N.RN.3	N/A				•	

14.3	Imagine the Possibilities Imaginary and Complex Numbers	• Determine powers of i. • Simplify expressions involving imaginary numbers. • Understand properties of the set of complex numbers. • Determine the number sets to which numbers belong.	N.RN.1 N.RN.2 N.CN.1	• Exponentiation • The number i • Imaginary numbers • Pure imaginary number • Complex numbers • Real part of a complex number • Imaginary part of a complex number	•	•			
14.4	It's Not Complex - Just Its Solutions Are Complex! Solving Quadratics with Complex Solutions.	• Calculate complex roots of quadratic equations and complex zeros of quadratic functions. • Interpret complex roots of quadratic equations and complex zeros of quadratic functions. • Determine whether a function has complex solutions from a graph and from an equation in radical form. • Determine the number of roots of a quadratic equation from a graph and from an equation in radical form.	A.REI.4.b N.CN.1 N.CN.7	•Imaginary roots •Imaginary zeros			•	•	

15	Other Functions and Inverses	This chapter focuses on piecewise functions, absolute value functions, and step functions. Inverses of linear functions are introduced graphically, numerically, and algebraically, which is then extended to include non-linear functions.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
15.1	I Graph in Pieces Linear Piecewise Functions	• Create graphs of linear piecewise functions. • Write linear piecewise functions from scenarios, tables, and graphs. • Compare a linear absolute value function to a linear piecewise function.	F.IF.4 F.IF.5 F.IF.7b	N/A					•
15.2	Step By Step Step Functions	• Write and graph step function problem situations. • Analyze the graphs of step functions. • Use technology to graph a step function.	F.IF.4 F.IF.5 F.IF.7b	•Step function •Greatest integer function (floor function) •Least integer function (ceiling function)		•	•		•
15.3	The Inverse Undoes What a Function Does Inverses of Linear Functions	• Determine the inverse of a given situation using words. • Determine the inverse of a function numerically using a table. • Determine the inverse of a function using algebra. • Determine the inverse of a function using graphical representations. • Calculate compositions of functions. • Use compositions of functions to determine whether functions are inverses.	A.CED.1 A.CED.4 F.IF.1 F.IF.2 F.BF.1.a F.BF.4.a F.BF.4.b	•Inverse operation •Inverse function •Composition of functions	•	•	•	•	

15.4	Taking the Egg Plunge! Inverses of Non-Linear Functions	• Determine the inverse of a linear or non-linear function using a table of values. • Determine the inverse of a linear or non-linear function using a graph. • Determine whether given functions are one-to-one functions. • Identify types of functions that are always, sometimes, or never one-to-one functions. • Determine the equation of the inverse of a quadratic function. • Determine the inverse of a quadratic function in terms of a problem situation.	A.CED.4 F.IF.1 F.IF.2 F.IF.5 F.IF.7 F.BF.4.a	•One-to-one function •Restrict the domain		•	•		•

16	Mathematical Modeling	This chapter presents opportunities to model real-world data using linear, exponential, quadratic, and piecewise functions. The focus is on determining the appropriate function or functions for a given data set.			Modules	Worked Examples	Peer Analysis	Talk the Talk	Technology
Chapter	**Lesson Title**	**Key Math Objective**	**CCSS**	**Key Terms**					
16.1	People, Tea, and Carbon Dioxide Modeling Using Exponential Functions	• Write exponential models from data sets. • Use models to solve problems.	F.IF.4 F.IF.5 F.IF.7 F.BF.1 F.BF.4 F.LE.1 F.LE.2	N/A					•
16.2	Stop! What is Your Reaction? Modeling Stopping Distances and Reaction Times	• Use a function to model a problem situation. • Interpret characteristics of a function in terms of a problem situation. • Interpret the inverse of a function in terms of a problem situation. • Compare graphs of functions. • Interpret the graphs of functions in terms of a problem situation. • Analyze results to write a report.	F.IF.4 F.IF.5 F.IF.7 F.BF.1 F.BF.4 F.LE.1 F.LE.2	N/A					•
16.3	Modeling Data Helps Us Make Predictions Using Quadratic Functions to Model Data	• Use quadratic functions to model data. • Use graphs of quadratic functions to make predictions. • Determine whether predicted values make sense in terms of various problem situations.	F.IF.4 F.IF.5 F.IF.7 F.BF.1 F.BF.4 F.LE.1 F.LE.2	N/A					•
16.4	BAC is BAD News Choosing a Function to Model BAC	• Determine the type of regression equation that best fits a graph. • Use a function to model a problem situation. • Interpret characteristics of a function in terms of a problem situation. • Analyze results to write a report.	F.IF.4 F.IF.5 F.IF.7 F.BF.1 F.BF.4 F.LE.1 F.LE.2	N/A		•			•

16.5	Cell Phone Batteries, Gas Prices, and Single Family Homes Modeling with Piecewise Functions	• Write a scenario to model a graph. • Determine a linear piecewise function to model a graph. • Interpret parts of a graph in terms of a problem situation. • Determine a non-linear piecewise function to model data. • Graph a non-linear piecewise function to model a problem situation. • Determine intervals for a non-linear piecewise function to best model data.	F.IF.4 F.IF.5 F.IF.7 F.BF.1 F.BF.4 F.LE.1 F.LE.2	N/A				•	•