Curriculum Map

Algebra 1, 2012-13

[Teacher]

Standards for Mathematical Practice	Objectives	Major & Minor Assessments
1) Make sense of problems and persevere in solving them.	Students will be able to determine if a situation should be modeled by a one or two variable equation. Students will be able to determine if a situation should be modeled by an equation or an inequality. Students will be able to determine of a situation should be modeled by a linear or exponential model. Students will be able to analyze problems and apply a different strategy if necessary. Students will be able to check solutions to make sure that they make sense in the context of the problem.	Mini Quiz 1.1 Mini Quiz 1.2 Test 1.1 Mini Quiz 1.3 Mini Quiz 1.4 Mini Quiz 1.5 Test 1.2 Mini Quiz 1.6
2) Reason abstractedly and quantitatively.	Students will be able to identify constraints placed on the unknowns based on the context of the problem. Students will be able to analyze a problem situation to determine the most appropriate representation. Students will be able to create algebraic equations, tables, graphs and/or an oral explanation to represent real world problems.	Mini Quiz 1.1 Mini Quiz 1.2 Test 1.1 Mini Quiz 1.3 Mini Quiz 1.4 Mini Quiz 1.5 Test 1.2 Mini Quiz 1.6
3) Construct viable arguments and critique the reasoning of others.	Students will be able to justify each step in the equation solving process both orally and written. Students will be able to analyze errors and faulty reasoning in solution processes. Students will be able to make arguments, test arguments, and revise arguments based on testing outcomes. Students will be able to use counterexamples to prove or disprove arguments.	Mini Quiz 1.1 Mini Quiz 1.2 Test 1.1 Mini Quiz 1.3 Mini Quiz 1.4 Test 1.2 Mini Quiz 1.6
4) Model with mathematics.	Students will be able to construct a nonverbal representation of a verbal problem. Students will be able to simplify a complicated problem by making assumptions and approximations.	Mini Quiz 1.1 Mini Quiz 1.2 Test 1.1 Mini Quiz 1.3 Mini Quiz 1.4 Mini Quiz 1.5

		Test 1.2
5) Use appropriate tools strategically.	Students will be able to explore a problem numerically or graphically by using Geometer SketchPad. Students will be able to use a calculator not only for completing calculations but to investigate or verify thinking about a problem.	Test 1.2
6) Attend to precision.	Students will be able to use correct vocabulary when discussing problems. Students will be able to demonstrate their understanding of the mathematical processes required to solve a problem by carefully showing all of the steps in the solving process. Students will be able to label final answers appropriately. Students will be able to give final answers to an appropriate degree of accuracy. Students will be able to label the axes of graphs and use appropriate scales.	Mini Quiz 1.1 Test 1.1 Mini Quiz 1.4 Mini Quiz 1.5 Test 1.2 Mini Quiz 1.6
7) Look for and make use of structure.	Students will be able to recognize linear equations in various forms and realize which form is most useful in a given situation. Students will be able to make observations about how equations are set up to decide the possible ways to solve the equation or graph the equation. Students will be able to analyze given data and determine if it is best represented by a linear function, an exponential function, or a quadratic function. Students will be able to identify patterns in data.	Mini Quiz 1.5 Test 1.2
8) Look for and express regularity in repeated reasoning.	Students will be able to use patterns and/or other observations to create general relationships in the form of an algebraic equation or inequality.	Mini Quiz 1.2 Test 1.1 Mini Quiz 1.3

Curriculum Map

Algebra 1, 2012-13

[Teacher]

Unit Info (Title, timeline, Essential Questions)	Standards (MA state standards and CCSC writing benchmarks)	Outcomes—skills and subskills	Assessments
U1: Relationships between Quantities and Reasoning with Equations 8/28-10/25 EQ1: When and how is mathematics used in solving real world problems? EQ2: What characteristics of problems would determine how to model the situation and develop a problem solving strategy? **What characteristics of problems would help to distinguish whether the situation could be modeled by a linear or exponential model?	**Number & Quantity** N.Q.1 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Students will be able to choose, interpret, and use units of measure to accurately represent problems and model real-world scenarios with a reasonable level of precision. (2, 6)	Mini Quiz 1.1 • A.SSE.1 • A.SSE.2 • A.CED.1 • A.REI.1 • A.REI.3 • MP1, 2, 3, 4, 6 Mini Quiz 1.2 • A.CED.1 • A.REI.1 • A.REI.3 • A.CED.4 • A.REI.MA.3a • N.Q.3 • MP 1, 2, 3, 4, 8 Test 1.1 • A.SSE.1 • A.SSE.2 • A.CED.1 • A.CED.4 • A.REI.1
	N.Q.2 Define appropriate quantities for the purpose of descriptive modeling.	Students will be able to select appropriate scale and labels for graphs that represent a given real world scenario. (4, 5, 6)	
	N.Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	Students will be able to model a real world scenario using appropriate quantities. (2, 4, 8)	

EQ3: Why is it necessary to follow set rules/procedures/properties when manipulating numeric or algebraic expressions?	**Algebra** A.SSE.1 Interpret expressions that represent a quantity in terms of its context. a) Interpret parts of an expression, such as terms, factors, and coefficients. b) Interpret complicated expressions by viewing one or more of their parts as a single entity.	Students will be able to describe the structure of a linear equation/inequality and use this structure to devise a plan for solving the equation. (1, 3, 7)	• A.REI.3 • A.REI.MA.3a • N.Q.3 • MP1, 2, 3, 4, 6, 8 Mini Quiz 1.3 • A.CED.1 • A.REI.1 • A.REI.3 • A.REI.MA.3a • MP 1, 2, 3, 4, 8 Mini Quiz 1.4 • A.CED.1 • A.REI.1 • A.REI.3 • A.REI.3a • A.CED.2 • A.CED.3 • N.Q.1 • N.Q.2 • MP 1, 2, 3, 4, 6 Mini Quiz 1.5 • A.CED.2 • A.CED.3 • A.CED.4 • MP 1, 2, 4, 5, 6, 7 Test 1.2
	A.SSE.2 Use the structure of an expression to identify ways to rewrite it.	Students will be able to analyze the structure of an expression to help develop a plan for solving a problem. (1,7)	
	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. *Limit exponential equations to integer outputs.*	Students will be able to create linear equations, linear inequalities, and exponential equations in one variable. (2, 4, 8)	

	A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. *Limit to linear and exponential equations.*	Students will be able to create linear equations and exponential equations in two variables to represent relationships between two quantities. (2, 4, 8)	• A.CED.1 • A.CED.2 • A.CED.3 • A.CED.4 • A.REI.1 • A.REI.3 • A.REI.MA.3a • N.Q.1 • N.Q.2 • MP—all but 8
	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.	Students will be able to represent the solutions to a linear equation or an exponential equation in two variables by graphing the solutions. (4, 5, 6) Students will be able to explain the meaning of solutions to equations and inequalities using the context of the problem. (2, 3, 4) Students will be able to eliminate algebraic solutions which do not make sense in the context of the problem. (1, 7)	Mini Quiz 1.6 • A.SSE.2 • A.CED.1 • A.REI.3 • N.Q.1 • MP 1, 2, 3, 6 Mini Quiz 1.7 • A.CED.2 • A.CED.3 • N.Q.1 • N.Q.3 • F.LE.1 IA1 • N.Q.1

	A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	Students will be able to solve literal equations. (7, 8) Students will be able to translate linear equations between standard form and slope intercept form. (1, 7)	• N.Q.2 • N.Q.3 • A.SSE.1 • A.SSE.2 • A.CED.1 • A.CED.2 • A.CED.3 • A.CED.4 • A.REI.1 • A.REI.3 • A.REI.MA.3a • F.LE.1 Unit 1 Problem • TBD Final Exam
	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. *Emphasis is on linear equations.*	Students will be able to carry out, describe, and justify each step of the plan for solving an equation or inequality. (1, 3, 6)	
	A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Students will be able to solve linear equations, linear inequalities, and exponential equations in one variable (including those with absolute value). (1, 3, 7)	
	A.REI.MA.3a Solve linear equations and inequalities in one variable involving absolute value.		

	Functions F.LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. a) Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals. b) Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c) Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	Students will be able to distinguish between situations that can be modeled with linear functions and with exponential functions. (1, 7) Students will be able to prove that linear functions grow by equal differences over equal intervals (additive change) and that exponential functions grow by equal factors over equal intervals (multiplicative change). (1,6, 7)	

Curriculum Map

Algebra 1, 2012-13

[Teacher]

Unit Info (Title, timeline, Essential Questions)	Standards (MA state standards and CCSC writing benchmarks)	Outcomes—skills and subskills	Assessments
U2: Linear and Exponential Relationships 10/28-1/24 EQ1: How can we use mathematical models to describe change or changes over time? EQ2: How are patterns of change related to the behavior of functions? EQ3: How are functions and their graphs related? EQ4: How can patterns, relations, and functions be used as tools to best describe and help explain real-life situations?	N.RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.	Students will be able to apply understanding of properties of exponents to build understanding of rational exponents and radicals. (1, 8)	Mini Quiz 2.1 Test 2.1 Linear Systems RT Project Mini Quiz 2.2 Mini Quiz 2.3 Test 2.2 RT Reflection Mini Quiz 2.4 Midterm Final Exam
	N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Students will be able to translate between radical form and exponential notation. (1, 7)	
	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.	Students will be able to carry out, describe, and justify each step of the plan for solving a system of equations. (1, 3, 7)	
	A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of	Students will be able to solve systems of equations by various methods. (1, 6, 7)	

	linear equations in two variables.	Students will be able to explain when a system of equations will yield one solution, no solution, or infinite solutions. (1, 3, 8)	
	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).	Students will be able to construct an argument as to how the points on a curve/line are represented by its algebraic equation. (3, 7)	
	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 online graphing tools 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.~~	Students will be able to show the equality of two functions using multiple representations (graphically, algebraically and with a table). (3, 4, 5)	

	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.	Students will be able to explain why a particular shaded region represents the solution of a given linear inequality or system of linear inequalities. (1, 3, 5, 7) Students will be able to explain the meaning behind a dotted boundary versus a solid boundary line when graphing solutions to linear inequalities. (1, 3, 5, 7)	
	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*).	Students will be able to determine if a relation is a function. (1, 5, 7, 8) Students will be able to identify the domain and range of a function from multiple representations. (2, 5, 6) Students will be able to find function values. (1, 6, 8) Students will be able to find the value of x in a function when given the value of f(x). (1, 6 , 8)	

		Students will be able to apply the vertical line test. (5, 8)	
	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.	Students will be able to make connections between context and algebraic representations which use function notation. (2, 8)	
	F.IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of integers.	Students will know that arithmetic sequences are examples of linear functions with additive changes and geometric sequences are examples of exponential functions with multiplicative changes. (1, 8)	
	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. *Emphasis is on linear and exponential functions.*	Students will be able to translate from algebraic representations to graphic or numeric representations while also noting key features. (1, 5, 6)	

	F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *Emphasis is on linear and exponential functions.*	Students will be able to relate the concept of domain to various types of functions. (2, 7) Students will be able to describe the restrictions on the domain of all functions based on their real world context. (2, 3, 4)	
	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. *Emphasis is on linear and exponential functions whose domain is a subset of integers.*	Students will be able to identify the rate of change from multiple representations. (1, 6) Students will be able to distinguish the type of rate of change (positive, negative, or zero) of a given function. (1, 7)	
	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) Graph linear ~~and quadratic functions~~ and show intercepts, maxima, and minima.	Students will be able to graph linear functions and show intercepts. (1, 5, 6) Students will be able to graph exponential functions, showing intercepts and end behavior. (1, 5, 6,)	

	e) Graph exponential ~~and logarithmic~~ functions, showing intercepts and end behavior, ~~and trigonometric functions, showing period, midline, and amplitude~~.		
	F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Students will be able to recognize common attributes of a function from various representations. (4, 7)	
	F.BF.1 Write a function that describes a relationship between two quantities. a) Determine an explicit expression, a recursive process, or steps for calculation from a context. *Limit to linear and exponential functions.*	Students will be able to create a function to represent a linear or exponential relation in two variables. (1, 2, 7)	
	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.	Students will be able to write arithmetic and geometric sequences recursively and with a formula. (1, 8)	

	F.LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. a) Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals. b) Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c) Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	Students will be able to distinguish between situations that can be modeled with linear functions and with exponential functions. (1, 7) Students will be able to prove that linear functions grow by equal differences over equal intervals (additive change) and that exponential functions grow by equal factors over equal intervals (multiplicative change). (1, 3, 7)	
	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 (including reading these from a table.)	Students will be able to write arithmetic and geometric sequences recursively and with a formula. (1, 8)	

	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.	Students will be able to show graphically or by a table that exponential functions will ultimately exceed linear and quadratic functions. (2, 4, 6, 7)	
	F.LE.5 Interpret the parameters in a linear or exponential function in terms of a context. *Limit exponential functions to the form* $f(x) = b^x + k$.	Students will be able to interpret the slope and y-intercept of a linear model in terms of context. (2, 3) Students will be able to identify the initial amount present in an exponential model. (2)	

Curriculum Map

Algebra 1, 2012-13

[Teacher]

Unit Info (Title, timeline, Essential Questions)	Standards (MA state standards and CCSC writing benchmarks)	Outcomes—skills and subskills	Assessments
Unit 3: Expressions & Equations 1/29 – 3/21 EQ1: How is solving by factoring different from just factoring? EQ2: What are like terms? EQ3: How is multiplying polynomials different from factoring them? EQ4: How do I identify the GCF when given a polynomial?	A.SSE.1 Interpret expressions that represent a quantity in terms of its context. a) Interpret parts of an expression, such as terms, factors, and coefficients. b) Interpret complicated expressions by viewing one or more of their parts as a single entity.	Students will be able to make connections between algebraic representations and mathematics vocabulary. (2, 4, 7) Students will be able to identify parts of an expression such as terms, factors, coefficients, etc. (1, 6, 7)	Mini Quiz 3.1 Test 3.1 Mini Quiz 3.2 Mini Quiz 3.3 Test 3.2 Mini Quiz 3.4 Linear, Exponential, and Quadratic Models—LEARNING TASK IA3 Final Exam
	A.SSE.2 Use the structure of an expression to identify ways to rewrite it.	Students will be able to use properties of mathematics to alter the structure of an expression. (1, 7) Students will be able to select and then use an appropriate factoring technique. (1, 6, 7)	
	A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	Students will be able to connect the factors, zeroes, and x-intercepts of a quadratic graph. (6, 7)	

	a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	Students will be able to use the zero-product property to solve quadratic equations. (1, 6, 7) Students will be able to recognize that quadratics that are perfect squares produce graphs which are tangent to the x-axis at the vertex. (7) Students will be able to recognize key features of a quadratic model given in vertex form. (1, 2, 7)	
	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.	Students will be able to show that when polynomials are added, subtracted, or multiplied that the result is another polynomial. (1, 2, 7)	
	A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions,	Students will be able to distinguish between linear, quadratic, and exponential relationships given the verbal, numeric and/or graphic representations. (1, 7, 8)	

	and ~~simple rational~~ and exponential 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.	Students will be able to distinguish between linear, quadratic, and exponential relationships given numeric or verbal representations. (1, 7, 8) Students will be able to determine unknown parameters needed to create an equation that accurately models a given situation. (1, 2, 4)	
	A.REI.4 Solve quadratic equations in one variable. 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.	Students will be able to solve quadratic equations using various methods and recognize the most efficient method. (1, 2, 7) Students will be able to use the value of the discriminant to determine if a quadratic equation has one double solution, two unique solutions or no real solutions. (1, 2, 6, 7)	

	A.REI.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	Students will be able to solve a simple system of a linear equation and a quadratic equation in two variables both algebraically and graphically. (1, 6, 7)	

Unit Info (Title, timeline, Essential Questions)	Standards (MA state standards and CCSC writing benchmarks)	Outcomes—skills and subskills	Assessments
Unit 4: Descriptive Statistics and MCAS Prep 3/24 – 5/9 EQ1: What are the different methods of data representation and what kinds of data do we use to create them? EQ2: What are the advantages and disadvantages of each method of data representation? EQ3: How can we use summary statistics and data representations to describe a distribution or support/refute a claim?	S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).	Students will be able to determine the best data representation to use for a given situation. (1, 7) Students will be able to identify and explain key features of each plot (dot pots, histograms, and box plots) .(1, 3, 4, 5) Students will be able to create dot plots, histograms, and box plots given data. (1, 4, 5, 6) Students will be able to analyze data given in different forms. (1, 2, 7)	Mini Quiz 4.1 Mini Quiz 4.2 Mini Quiz 4.3 Test 4.1 Mini Quiz 4.4 Final Exam
	S.ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range,	Students will be able to interpret measures of center and spread (variability) to compare several data sets. (1, 2, 3)	

	standard deviation) of two or more different data sets.	Students will be able to identify shapes of distributions (skewed left or right, bell, uniform, symmetric). (1, 7) Students will be able to recognize appropriateness of mean/standard deviation for symmetric data. (1, 7) Students will be able to recognize appropriateness of 5 number summary for skewed data. (1, 7)	
	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).	Students will be able to recognize gaps, clusters, and trends in the data set. (1, 7) Students will be able to recognize outliers and their impact on the center. (1, 7) Students will be able to effectively communicate what the data reveals. (3, 4) Students will know that in order to compare distributions there must be	

		common scales and units. (5, 6)	
	S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. 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. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	Students will be able to recognize types of relationships that lend themselves to linear and exponential models. (6, 7) Students will be able to create and use regression models to represent a contextual situation. (1, 7) Students will be able to create a graphic display of residuals. (4, 5, 6) Students will be able to recognize patterns in residual plots. (7) Students will be able to calculate residuals with a calculator. (1, 5, 6) Students will be able to recognize a linear	

		relationships displayed in a scatter plot. (1, 7) Students will be able to determine an equation for the line of best fit for a set of data points. (1, 2, 6, 7)	
	S.ID.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Students will be able to interpret the slope and y-intercept of a linear model in the context of the data. (2, 7)	
	S.ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.	Students will know the range of the values ($-1 \le r \le 1$) and the interpretation of those values for correlation coefficients. (1, 2, 3) Students will be able to compute and analyze the correlation coefficients for the purpose of communicating the goodness of fit of a linear model for a given data set. (1, 2, 3, 4, 5, 6)	

Curriculum Map

Algebra 1, 2012-13

[Teacher]

Unit Info (Title, timeline, Essential Questions)	Standards (MA state standards and CCSC writing benchmarks)	Outcomes—skills and subskills	Assessments
Unit 5: Quadratic Functions & Modeling EQ1: What is a parent function? EQ2: What does a quadratic function look like?? EQ3: How many solutions can a quadratic equation have?	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.	Students will be able to interpret key features of quadratic functions including intercepts, intervals where the function is increasing or decreasing or positive or negative, relative maximums and minimums, symmetries, end behavior, and periodicity. (1, 4, 5, 6, 7) Students will be able to use key features of quadratic functions to sketch a graph. (4, 5, 6) Students will be able to make connections between the experience of working with linear and exponential functions to quadratic functions. (1, 2, 7)	Mini Quiz 5.1 Mini Quiz 5.2 Learning Task 5.1 Final Exam

	F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	Students will be able to make connections between the experience of working with linear and exponential functions to quadratic functions. (1, 2, 7) Students will be able to describe the restrictions on the domain of a function based on real world context. (2, 3) Students will be able to recognize and use alternate vocabulary for domain and range such as input/output or independent/dependent. (3, 4, 6)	
	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. Graph linear and quadratic functions and show intercepts, maxima, and minima.	Students will be able to graph quadratic functions by hand, showing key features. (4, 5, 6) Students will be able to graph quadratic functions using Geometer Sketchpad. (4, 5, 6)	

	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.8a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. F.IF.8b Use the properties of exponents to interpret expressions for exponential functions.	Students will be able to make connections between different representations of functions: graphs, algebraic models, contextual model. (1, 2, 4, 5) Students will be able classify given functions as exponential growth or decay. (1, 7)	
	F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Students will be able to make connections between the experience of working with linear and exponential functions to quadratic functions. (1, 2, 7) Students will be able to recognize common attributes of a function from	

		multiple representations. (2, 4, 5, 6, 7)	
	F.BF.1 Write a function that describes a relationship between two quantities.	Students will be able to make connections between the experience of working with linear and exponential functions to quadratic functions. (1, 2, 7) Students will be able to write the algebraic representation of a quadratic function from a contextual situation. (1, 2, 8)	
	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.	Students will be able to make generalizations about the changes that will result in the graph of a quadratic (and maybe absolute value) functions as a result of making a particular change to the algebraic representation of the function. (7, 8)	
	F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more	Students will be able to compare linear and exponential growth to quadratic growth. (1, 7, 8)	

	generally) as a polynomial function.		