Title	**Grade 8 Algebra I 2013**
Type	Essential
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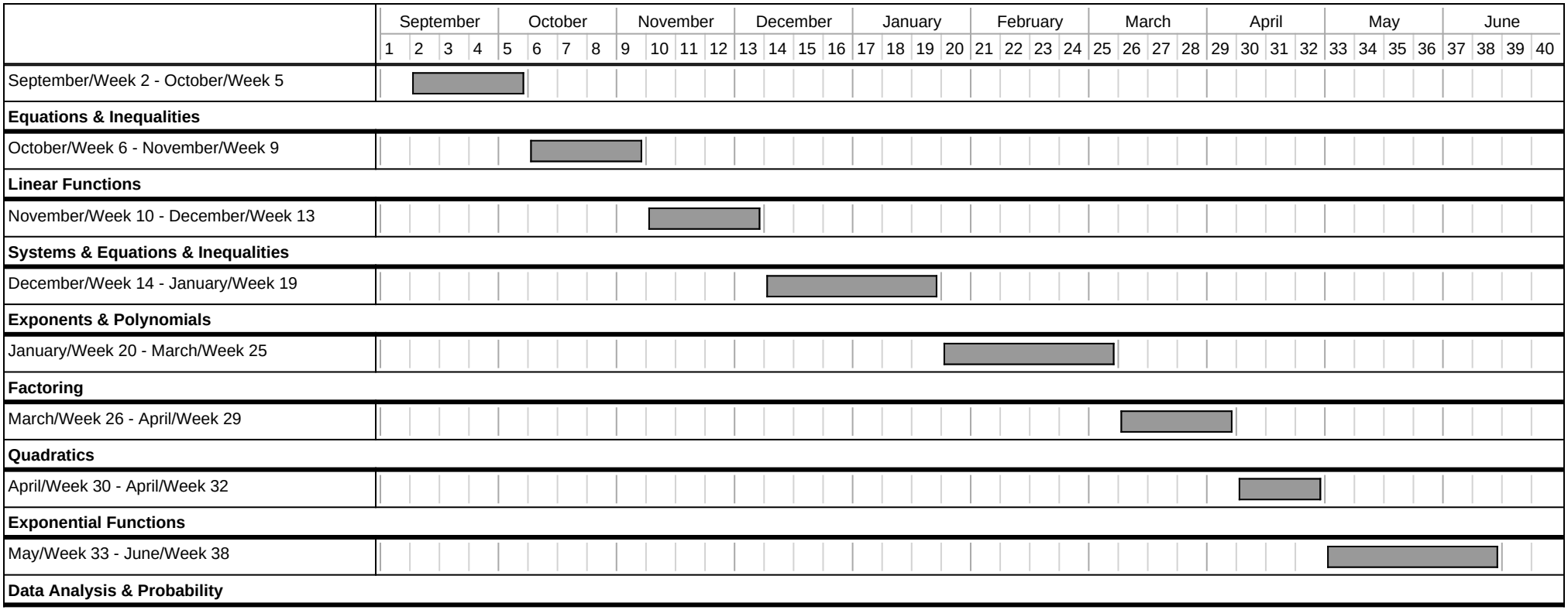
Grade(s)	08
Location	Eisenhower Middle School
Curriculum Writing History	
Notes	
Attachments	

Title : Grade 8 Algebra I 2013
Type : Essential



Title : Grade 8 Algebra I 2013
Type : Essential

Duration: September/Week 2 - October/Week 5				
UNIT NAME: Equations & Inequalities				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Apply Properties of equality & inequality • Use inverse operations to solve equations and inequalities containing variables. • Write equations and inequalities to represent situations. • Simplify equations and inequalities before solving. • Solve equations graphically. • Solve absolute-value equations and proportions. • Solve compound and absolute-value inequalities. • Rewriting equations in two or more variables	• How do you evaluate algebraic expressions? • How do you solve one-step equations and inequalities? • How do you write an expression to represent a real world situation? • How do you write equations and inequalities? • How do you solve two-step equations and inequalities? • How do solve equations/ inequalities in one variable that contain terms on both sides? • How do you eliminate a denominator in an equation/ inequality? • How do you find ratios and write and solve proportions? • How do you solve an equation in two or more variables for one of the variables? • How do you solve an equation/inequality in one variable that contain absolute-value expressions? • How do you graph an inequality in one variable? • How do you solve a compound inequality in one variable? • How do you graph the solution set of a compound inequality in one variable?	• Reason quantitatively and use units to solve problems • Interpret the structure of expressions • Create equations that describe numbers and relationships • Understand solving equations as a process of reasoning and explain the reasoning • Solve equations and inequalities in one variable	• Evaluate algebraic expressions • Translate verbal phrases into expressions • Translate verbal sentences into equations and inequalities • Compare measurements for precision • Choose a more precise measurement • Solve one-step equations and inequalities using algebra • Solve two-step equations and inequalities • Solve multi-step equations and inequalities • Solve equations/inequalities with variables on both sides • Solve absolute-value equations/inequalities • Rewrite equations and formulas • Find ratios and write and solve proportions	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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] N.Q.3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] A.CED.3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing*

				nutritional and cost constraints on combinations of different foods. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] A.REI.3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (09-12)[State:Common Core State Standards (CCSS)] 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). (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] A.SSE.1-Interpret expressions that represent a quantity in terms of its context. * (09-12) [State:Common Core State Standards (CCSS)] A.SSE.1.a-Interpret parts of an expression, such as terms, factors, and coefficients. (09-12) [State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] A.SSE.2-Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.* (09-12) [State:Common Core State Standards (CCSS)]
Plans:				

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: October/Week 6 - November/Week 9				
UNIT NAME: Linear Functions				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Graphing linear equations and functions using a variety of methods • Recognizing how changes in linear equations and functions affect their graphs • Using graphs of linear equations and functions to solve real world problems • Writing linear equations in a variety of forms • Using linear models to solve problems • Modeling data with a line of best fit • Analyze relationships between variables	• How do you graph linear equations? • How do you use intercepts to graph equations? • How do you find the slope of a line and interpret slope as a rate of change? • How do you graph linear equations in slope-intercept form? • How do you graph linear equations in point-slope form? • How do you write and graph direct variation equations? • How do you write an equation in slope-intercept form? • How do you write an equation in point-slope form? • How do you find the equation of a line given two points? • How do you write linear equations in standard form? • How do you write equations of parallel and perpendicular lines? • How do you make a scatter plot and write an equation to model the data? • How can you use a line of best fit to make predictions about data? •	• Understand the concept of a function and use function notation • Interpret functions that arise in applications in terms of a context • Represent and solve equations graphically	• Determine whether a relation is a function • Use function notation • Use trend lines on scatter plots to make predictions • Graphing linear equations using intercepts • Find the slope of a line and interpret slope as a rate of change • Graph linear equations using slope-intercept form • Graph linear equations using point-slope form • Write and graph direct variation equations • Write an equation of a line in slope-intercept form • Write an equation of a line in point-slope form • Write an equation in standard form • Write equations of parallel and perpendicular lines • Identify the common difference of an arithmetic sequence • Find the "n"th term of an arithmetic sequence • Extend an arithmetic sequence	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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] N.Q.3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] A.CED.2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (09-12)[State:Common Core State Standards (CCSS)] A.CED.3-Represent constraints

				by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* (09-12)[State:Common Core State Standards (CCSS)] A.REI.3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] 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). (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] 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. * (09-12) [State:Common Core State Standards (CCSS)] 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. * (09-12) [State:Common Core State Standards (CCSS)] F.BF.1-Write a function that describes a relationship between two quantities. * (09-12) [State:Common Core State Standards (CCSS)] F.BF.1.a-Determine an explicit expression, a recursive process, or steps for calculation from a context. (09-12)[State:Common Core State Standards (CCSS)] F.BF.1.b-Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.* (09-12)[State:Common Core State Standards (CCSS)] F.BF.1.c-(+) Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.* (09-12)

				[State:Common Core State Standards (CCSS)] 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. * (09-12) [State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)] F.BF.4-Find inverse functions. (09-12)[State:Common Core State Standards (CCSS)] 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. *For example, f(x) =2 x^3 or f(x) = (x+1)/(x–1) for x $\neq$ 1.* (09-12)[State:Common Core State Standards (CCSS)] 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). (09-12)[State:Common Core State Standards (CCSS)] F.LE.5-Interpret the parameters in a linear or exponential function in terms of a context. (09-12)[State:Common Core State Standards (CCSS)] S.ID.6.-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] S.ID.6.c-Fit a linear function for a scatter plot that suggests a linear association. (09-12)[State:Common Core State Standards (CCSS)] S.ID.7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. (09-12)[State:Common Core State Standards (CCSS)] S.ID.8-Compute (using technology) and interpret the correlation coefficient of a linear fit. (09-12)[State:Common Core State Standards (CCSS)] S.ID.9-Distinguish between correlation and causation.

				(09-12)[State:Common Core State Standards (CCSS)] 8.EE.8-Analyze and solve pairs of simultaneous linear equations. (08)[State:Common Core State Standards (CCSS)] 8.EE.8.a-Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. (08)[State:Common Core State Standards (CCSS)] 8.EE.8.b-Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. (08)[State:Common Core State Standards (CCSS)] 8.EE.8.c-Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (08)[State:Common Core State Standards (CCSS)] 8.F.1-Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of

				ordered pairs consisting of an input and the corresponding output.* (08)[State:Common Core State Standards (CCSS)] 8.F.2-Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. (08)[State:Common Core State Standards (CCSS)] 8.F.4-Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. (08)[State:Common Core State Standards (CCSS)] 8.SP.1-Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association,

				linear association, and nonlinear association. (08)[State:Common Core State Standards (CCSS)] 8.SP.2-Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. (08)[State:Common Core State Standards (CCSS)] 8.SP.4-Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores? (08) [State:Common Core State Standards (CCSS)]
Plans:				

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: November/Week 10 - December/Week 13				
UNIT NAME: Systems & Equations & Inequalities				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Solve systems of equations using various methods • Solve systems of inequalities by graphing • Use systems of equations to solve real-world problems	• How do you solve a system of equations by graphing? • How do you solve a system of equations by substitution? • How do you solve a system of equations by elimination? • How do you solve a system of inequalities? • How do you write a system given a real world situation? • What would a real world example of a system be that had no solution? • What would a real world example of a system be that had an infinite number of solutions?	• Solve systems of equations • Solve systems of inequalities	• Graph and solve systems of linear equations • Solve systems of linear equations by substitution • Solve systems of linear equations by elimination • Solve systems by multiplying first • Identify the number of solutions of a linear system • Graph linear inequalities in two variables • Solve systems of linear inequalities in two variables	8.EE.8-Analyze and solve pairs of simultaneous linear equations. (08)[State:Common Core State Standards (CCSS)] 8.EE.8.a-Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. (08) [State:Common Core State Standards (CCSS)] 8.EE.8.b-Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. (08)[State:Common Core State Standards (CCSS)] 8.EE.8.c-Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (08) [State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] N.Q.3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] A.CED.2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (09-12)[State:Common Core State Standards (CCSS)] A.CED.3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent*

				inequalities describing nutritional and cost constraints on combinations of different foods. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)]
Plans:				

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: December/Week 14 - January/Week 19				
UNIT NAME: Exponents & Polynomials				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Apply properties of exponents to simplify expressions • Apply Pythagorean Theorem to real word situations • Adding, subtracting, and multiplying polynomials	• How do you change a negative exponent to a positive exponent? • How do you use properties of exponents involving products? • How do you use properties of exponents involving quotients? • How do you use zero and negative exponents? • How do you find the length of a missing side of a right triangle? • How do you identify the degree of a polynomial? • How do you classify a polynomial? • How do you add and subtract polynomials? • How do you multiply polynomials?	• Understand properties of exponents involving products and quotients • Understand zero and negative exponents • The relationship between the lengths of the three sides of a right triangle (Pythagorean Theorem) • Perform arithmetic operations on polynomials • Classify polynomials • Identify the degree of a polynomial	• Evaluate and simplify expressions containing zero and integer exponents • Evaluate and simplify expressions containing rational exponents • Find the "n"th root of an integer • Identify the hypotenuse of a right triangle • Find the length of the missing side of a right triangle using the Pythagorean Theorem • Apply the Pythagorean Theorem to real world situations • Find the distance between two points on a coordinate plane • Classify polynomials and write them in standard form • Identify the degree of a monomial • Evaluate polynomial expressions • Add and subtract polynomials • Multiply monomials • Multiply monomial by polynomial • Multiply polynomials • Find special products of binomials (perfect square trinomials and difference of squares)	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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] N.Q.3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] 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. *For example, we*

				define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5. (09-12)[State:Common Core State Standards (CCSS)] N.RN.2-Rewrite expressions involving radicals and rational exponents using the properties of exponents. (09-12) [State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] F.IF.8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (09-12) [State:Common Core State Standards (CCSS)] F.IF.8.a-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. (09-12)[State:Common Core State Standards (CCSS)] F.IF.8.b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, y =

				$(0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay. (09-12) [State:Common Core State Standards (CCSS)] A.SSE.2-Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.* (09-12) [State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)] 8.G.6-Explain a proof of the Pythagorean Theorem and its converse. (08)[State:Common Core State Standards (CCSS)] 8.G.7-Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (08)[State:Common Core State Standards (CCSS)] 8.G.8-Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. (08) [State:Common Core State Standards (CCSS)]

Title : Grade 8 Algebra I 2013
Type : Essential

Plans:

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: January/Week 20 - March/Week 25				
UNIT NAME: Factoring				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Factoring polynomials • Writing and solving polynomial equations to solve problems • Simplify and perform arithmetic operations with algebraic fractions	• How do you find the greatest common factor of a monomial? • How do you use the greatest common factor to factor a polynomial? • How do you factor a perfect square trinomial? • How do you factor a difference of squares binomial? • How do you factor quadratic trinomials? • How do you solve equations with factoring? • How do you simplify algebraic fractions? • How do you perform arithmetic operations with algebraic fractions? • What are the different methods for dividing polynomials? • Why do we factor polynomials?	• Simplify a polynomial by factoring completely • Solve polynomial equations in one variable by factoring completely • Perform arithmetic operations with algebraic fractions	• Identify the greatest common factor of monomials • Use the greatest common factor to factor a polynomial • Factor perfect square trinomial • Factor difference of squares binomial • Factor other trinomials using "guess and check" • Factor by grouping • Solve equations with factoring • Simplify algebraic fractions • Multiply algebraic fractions • Divide algebraic fractions • Add and subtract algebraic fractions • Divide polynomials by factoring • Divide polynomials using long division	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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] N.Q.3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] A.CED.3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing*

				nutritional and cost constraints on combinations of different foods. (09-12)[State:Common Core State Standards (CCSS)] F.IF.8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (09-12) [State:Common Core State Standards (CCSS)] F.IF.8.a-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. (09-12)[State:Common Core State Standards (CCSS)] F.IF.8.b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay. (09-12) [State:Common Core State Standards (CCSS)] A.SSE.2-Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.* (09-12) [State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)]
Plans:				

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: March/Week 26 - April/Week 29				
UNIT NAME: Quadratics				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Identifying quadratic functions • Graphing quadratic functions • Solving quadratic equations using several methods • Apply quadratic functions to real world situations	• How do you identify a quadratic function? • How do you find the minimum/maximum of a quadratic function? • How do you graph a quadratic function? • How do you identify the domain and the range? • How do you find the zeros of a quadratic function? • How do you find the axis of symmetry and the vertex of a parabola? • What happens when the coefficient of the x^2 term of a quadratic equation increases or decreases? • What will happen to the graph of a quadratic equation if the "c" term changes? • How do you solve a quadratic equation by graphing? factoring? using square roots? completing the square? using the quadratic formula? • What information does the value of the discriminant provide? • How can you find the solution of a system when one is quadratic and one is linear?	• Construct and compare linear and quadratic models and solve problems • Solve quadratic equations in one variable • Interpret expressions for functions in terms of the situation they model	• Identify quadratic functions and determine whether they have a minimum or a maximum • Graph a quadratic function and give its domain and range • Find the zeros of a quadratic function from its graph • Find the axis of symmetry and the vertex of a parabola • Graph a quadratic function in standard form • Transform quadratic functions • Solve quadratic equations by graphing • Solve quadratic equations by factoring • Solve quadratic equations by using square roots • Solve quadratic equations by completing the square • Solve quadratic equations by using the quadratic formula • Determine the number of solutions of a quadratic equation by using the discriminant • Solve systems of equations in two variables in which one equation is linear and the other is quadratic.	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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] 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.* (09-12) [State:Common Core State Standards (CCSS)] A.CED.3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* (09-12)[State:Common Core State Standards (CCSS)] A.REI.4-Solve quadratic equations in one variable.

				(09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] A.REI.7-Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = –3x$ and the circle $x^2 + y^2 = 3$. (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] 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(n) 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. * (09-12) [State:Common Core State Standards (CCSS)] 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. * (09-12) [State:Common Core State Standards (CCSS)] F.IF.7.a-Graph linear and quadratic functions and show intercepts, maxima, and minima. (09-12)[State:Common Core State Standards (CCSS)] F.IF.7.b-Graph square root,

				cube root, and piecewise-defined functions, including step functions and absolute value functions. (09-12) [State:Common Core State Standards (CCSS)] F.IF.7.c-Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (09-12) [State:Common Core State Standards (CCSS)] F.IF.7.d-(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. (09-12) [State:Common Core State Standards (CCSS)] F.IF.8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (09-12) [State:Common Core State Standards (CCSS)] F.IF.8.a-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. (09-12)[State:Common Core State Standards (CCSS)] F.IF.8.b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$

				, and classify them as representing exponential growth or decay. (09-12) [State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] F.BF.1-Write a function that describes a relationship between two quantities. * (09-12) [State:Common Core State Standards (CCSS)] F.BF.1.a-Determine an explicit expression, a recursive process, or steps for calculation from a context. (09-12)[State:Common Core State Standards (CCSS)] F.BF.1.b-Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.* (09-12)[State:Common Core State Standards (CCSS)] F.BF.1.c-(+) Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a*

				weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time. (09-12) [State:Common Core State Standards (CCSS)] F.LE.1-Distinguish between situations that can be modeled with linear functions and with exponential functions. (09-12) [State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)] F.LE.1.b-Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. (09-12)[State:Common Core State Standards (CCSS)] F.LE.1.c-Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. (09-12)[State:Common Core State Standards (CCSS)] A.SSE.3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. * (09-12)[State:Common Core State Standards (CCSS)] A.SSE.3.a-Factor a quadratic expression to reveal the zeros

				of the function it defines. (09-12) [State:Common Core State Standards (CCSS)] A.SSE.3.b-Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. (09-12)[State:Common Core State Standards (CCSS)]
Plans:				

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: April/Week 30 - April/Week 32				
UNIT NAME: Exponential Functions				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Recognize geometric sequences • Writing and graphing exponential functions • Comparing linear, exponential, and quadratic models	• How do you write and graph equations for exponential growth and decay? • How do you decide whether a linear, exponential, or quadratic model best represents data? • How can you identify key features of linear, exponential, and quadratic functions when they are modeled in different ways?	• Analyze functions using different representations • Construct and compare linear, quadratic, and exponential models and solve problems	• Recognize and extend geometric sequences • Find the "n"th term of a geometric sequence • Evaluate exponential functions • Identify and graph exponential functions • Solve problems involving exponential growth and decay • Compare linear, quadratic, and exponential models • Given a set of data, decide which type of function models the data and write an equation to describe the function • Compare functions in different representations • Estimate and compare rates of change	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.* (09-12) [State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] 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.* (09-12)[State:Common Core State Standards (CCSS)] 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. * (09-12) [State:Common Core State

				Standards (CCSS)] F.LE.1-Distinguish between situations that can be modeled with linear functions and with exponential functions. (09-12) [State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)] 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). (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12)[State:Common Core State Standards (CCSS)] F.LE.5-Interpret the parameters in a linear or exponential function in terms of a context. (09-12)[State:Common Core State Standards (CCSS)] A.SSE.3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity

				represented by the expression. * (09-12)[State:Common Core State Standards (CCSS)] A.SSE.3.c-Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.* (09-12)[State:Common Core State Standards (CCSS)]
Plans:				

Title : Grade 8 Algebra I 2013
Type : Essential

Duration: May/Week 33 - June/Week 38				
UNIT NAME: Data Analysis & Probability				
Enduring Understandings	**Essential Questions**	**Knowledge**	**Skills**	**Standards**
• Analyzing sets of data • Making and interpreting data displays • Finding probabilities of simple events • Finding probabilities of compound events	• How do you identify populations and sampling methods? • How do you compare measures of central tendency and dispersion? • How do you find a marginal frequency in a two-way frequency table? • How do you make a stem-and-leaf plots and histograms? • How do you make and interpret box-and-whisker plots? • How do you find the probability of an event? • How do you use the formula for permutations? • How do you use combinations to count possibilities? • How can you simplify solutions using compliments? • How do you distinguish between dependent and independent events?	• Summarize, represent, and interpret data on a single count or measurement variable • Summarize, represent, and interpret data into categorical and quantitative variables	• Identify populations and sampling methods • Compare measures of central tendency and dispersion • Find frequencies in a two-way frequency table • Make stem-and-leaf plots and histograms • Make and interpret box and whisker plots • Find sample spaces and probabilities • Use the formula for the number of permutations • Use combinations to count possibilities • Find probabilities of compound events • Examine independent and dependent events	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. (09-12) [State:Common Core State Standards (CCSS)] N.Q.2-Define appropriate quantities for the purpose of descriptive modeling. (09-12) [State:Common Core State Standards (CCSS)] N.Q.3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (09-12)[State:Common Core State Standards (CCSS)] S.ID.1-Represent data with plots on the real number line (dot plots, histograms, and box plots). (09-12)[State:Common Core State Standards (CCSS)] 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). (09-12)[State:Common Core State Standards (CCSS)] 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. (09-12) [State:Common Core State Standards (CCSS)]
Plans:				