Common Core Standards Curriculum Map - (Mathematics / Math Workshop)
QUARTER 1

Unit 1 - Creating and Interpreting Expressions and Equations

Common Core Standards and Content to Be Learned	*Essential Questions*	*Instructional Strategies*	*Assessment* Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: **Interpret the structure of expressions [Such as linear, exponential, quadratic expressions].** **A-CED.2** **Create equations that describe numbers or relationships [Such as, linear, quadratic, and exponential (integer inputs only); for A.CED.3 linear only]** **A-CED.1 A-CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ **Content to be learned:** • Simplify expressions. • Write expressions in equivalent forms. • Identify parts of expressions and equations and view one or more of their parts as a single entity • Interpret the parts of	How do you determine which symbol of equality or inequality is appropriate in a given context? How are variables used to create meaning in algebraic expressions and equations? What are the multiple representations for mathematical situations and when is each useful in a problem solving situation?	• ALEKS • Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

expressions and equations related to real-world situations. • Use tables, graphs, and equations to represent verbal descriptions. • Model relationships by creating expressions and equations. • Recognize and use patterns to write expressions and equations. • Create equations in two or more variables. • Use tables to graph equations on coordinate axes. • Identify independent and dependent variables		• Project based learning • Center-based learning	

Resources:

- ALEKS program

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QUARTER 1

Unit 2 - Solving Single Variable Equations and Inequalities

Common Core Standards and Content to Be Learned	***Essential Questions***	***Instructional Strategies***	***Assessment*** Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: N-Q.1 Reason quantitatively and use units to solve problems. [Foundation for work with expressions, equations and functions] N-Q.2. Define appropriate quantities for the purpose of descriptive modeling. N-Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. A-CED.1. Create equations and inequalities in one variable and use them to solve problems.Include equations arising from linear and quadratic functions, A-CED.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R. A-REI.1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the	• What are the possible number of solutions to an equation and to an inequality? • How do units of measure guide accuracy and create meaning in problem solving? • In what situations would it be useful and/or necessary to solve an equation for another variable within that equation? • What is the process that you should follow to solve an equation for a given variable?	• Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math • Project based learning • Center-based learning • ALEKS	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. A-REI.3. Solve linear equations and inequalities in 1 variable, including equations with coefficients represented by letters. **Content to be learned:** • Create single-variable linear, simple quadratic, absolute value, simple rational, and simple exponential equations and inequalities, including compound inequalities, and use them to solve problems. • Solve and justify the steps involved in solving single-variable equations and inequalities, including those with coefficients represented by letters. • Identify and use appropriate units of measure to solve single-variable equations and inequalities. • Solve equations and inequalities, including formulas, for any variable.			

<u>Resources:</u>

- ALEKS program

Unit 3 - Graphing the Solutions to Linear Equations and Linear Inequalities in Two Variables

Common Core Standards and Content to Be Learned	*Essential Questions*	*Instructional Strategies*	*Assessment* Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: Reason quantitatively and use units to solve problems. [Foundation for work with expressions, equations and functions] 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. Represent and solve equations and inequalities graphically [Linear and exponential; learn as general principle] A-REI.10.d in the coordinate plane, often forming a curve Understand that the graph of an equation in two variables is the set of all its solutions plotted (which could be a line). Represent and solve equations and inequalities graphically. [Linear and exponential; learn as general principle] 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. G-GPE.5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (for example, find an equation of a line,	How can you use linear equations and inequalities to model a real-world situation? What are the differences and similarities between the solution set of an inequality versus the solution set of an equation? What are the different methods used to graph an equation and an inequality; in what equation form is each method most appropriate?	• Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math • Project based learning • Center-based learning • ALEKS	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

parallel or perpendicular to a given line that passes through a given point). **Content to be learned:** • Choose and interpret the scale and the origin in graphs and data displays. • Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. • Graph the solutions to a linear inequality in two variables as a half-plane. • Choose an appropriate graphing technique based on the form of the equation or inequality (i.e., standard form, slope-intercept form, point slope form). • Choose an appropriate graphing technique based on the context of a given situation. • Write equations of lines that are parallel or perpendicular to a given line and passing through a given point.			

Resources:
- ALEKS program

Common Core Standards Curriculum Map - (Mathematics / Math Workshop)
QUARTER 2

Unit 4: Interpreting Functions

Adapted from the Charles A. Dana Center

Common Core Standards and Content to Be Learned	*Essential Questions*	*Instructional Strategies*	*Assessment* Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: **Understand the concept of a functions and use function notation.** ***[Learn as a general principle; focus on linear and exponential and on arithmetic and geometric sequences]*** **F-IF.1.** Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*). **F-IF.2.** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. **F-IF.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.* *This is major and is assessed.* **Interpret functions that arise in applications in terms of the context.** ***[Linear, exponential, and quadratic]*** 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*	How do you determine the domain and the range of a function and in what situations could there be restrictions on the domain and the range? How can you determine if a relation is a function? What are the key features of a function and how could you use them to sketch a graph of the function? What is the advantage of using the notation **f(x)** = as opposed to **y** = ? How would you represent a sequence using function notation?	• Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math • Project based learning • Center-based learning • ALEKS	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; ~~end behavior; and periodicity~~.★ 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.*★ 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.★ xxxxxx - Denotes additional standards not assessed on PARCC **Content to be learned:** • Understand the concept of a function as assigning to each element of the domain exactly one element of the range. • Use function notation and interpret statements that use function notation, including notation in terms of a given situation. • Determine the domain and range of a given function (both algebraically and graphically) and a function in a given context. • Evaluate functions for any input. • Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. • Interpret key features of graphs and tables of functions (i.e., intercepts, intervals where the function is increasing,			

decreasing, positive or negative, relative maximums and minimums, and symmetries). • Given key features of the functional relationship, sketch graphs. • Calculate and interpret the average rate of change of a function over a specified interval. • Estimate the rate of change from a graph.			

Resources:

- ALEKS Program

Common Core Standards Curriculum Map - (Mathematics / Math Workshop)
QUARTER 2
Unit 5: Building and Graphing Functions

Adapted from the Charles A. Dana Center

Common Core Standards and Content to Be Learned	*Essential Questions*	*Instructional Strategies*	*Assessment* Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: **Analyze functions using different representations. [Linear, exponential, quadratic, absolute value, step, piecewise-defined]** **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. e. Graph exponential ~~and logarithmic~~ functions, showing intercepts and end behavior, ~~and trigonometric functions, showing period, midline, and amplitude.~~ **Build a function that models a relationship between two quantities.** ***[For F.BF.1,2,linear, exponential and quadratic]*** **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. 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.* **Build new functions from existing functions.** ***[Linear, exponential, quadratic and absolute value; for F.BF.4a, linear***	How can the radical be rewritten in terms of rational exponents? How can expressions be rewritten in equivalent forms and how is this useful? In what situations would it be appropriate use a linear model verses an exponential model?	• ALEKS • Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math • Project based learning • Center-based learning	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

only] 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.~~ **Represent and solve equations and inequalities graphically.** ***[Linear and exponential; learn as a general principle]*** **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~~.★ xxxxxx - Denotes additional standards not assessed on PARCC **Content to be learned:** • Graph linear and quadratic functions showing intercepts, maxima, and minima. • Graph exponential functions showing intercepts and end behavior. • Graph absolute value, step, and piecewise defined functions. • Utilize technology to graph complicated functions. • Utilize technology to determine where the graphs of two functions intersect. • Determine an explicit expression, a			

recursive process, or the steps for calculations from a given situation to write a function that describes a relationship between two quantities. • Build a function to model situations by combining standard function types using arithmetic operations. • Write arithmetic and geometric sequences with an explicit formula. • Use arithmetic and geometric sequences to model situations. • Identify the effect on the graph of replacing **f**(**x**) with **f**(**x**) + **k**, **kf**(**x**), **f**(**kx**), and **f**(**x** + **k**)			

Resources:

- ALEKS Program

Common Core Standards Curriculum Map - (Mathematics / Math Workshop)
QUARTER 3

Unit 6 - Creating, Solving and Graphing Systems of Linear Equations and Linear Inequalities

Adapted from the Charles A. Dana Center

Common Core Standards and Content to Be Learned	*Essential Questions*	*Instructional Strategies*	*Assessment* Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: **Create equations that describe numbers or relationships. *[Linear, quadratic, and exponential (integer inputs only); for A.CED.3 linear only]*** **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.* **Solve systems of equations. *[Linear-linear and ~~linear-quadratic~~]*** **A-REI.5.** Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. **A-REI.6.** Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. **Represent and solve equations and inequalities graphically *[Linear ~~and exponential,~~ learn as general principle]*** **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~~	How can you use a system of linear equations or inequalities to model a real-world situation? What are the similarities and differences between the solutions of a system of linear equations and a system of linear inequalities? What are the possible number of solutions to a system of linear equations and what does the graphical representation of each look like? What are the different methods to solve a system; how is each method performed, and when is each method most efficient?	• ALEKS • Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math • Project based learning • Center-based learning	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

~~approximations.~~ Include cases where $f(x)$ and/or $g(x)$ are linear, ~~polynomial, rational, absolute value, exponential, and logarithmic functions.~~★ **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-plane. xxxxxx - Denotes additional standards not assessed on PARCC **Content to be learned:** • Solve systems of linear equations graphically, including those that have infinitely many solutions and those that have no solution. • Solve systems of linear equations using substitution and elimination and decide which of these methods is most appropriate. • Write a system of linear equations and/or inequalities to fit a given situation. • Solve systems of linear inequalities graphically and understand that the solution to the system is the region where the graphs of the individual inequalities overlap.			

Resources:

- ALEKS program

Unit 7: Polynomial Operations and Factoring

Common Core Standards and Content to Be Learned	*Essential Questions*	*Instructional Strategies*	*Assessment* Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
CCSS Standards for this unit: **Use properties of rational and irrational numbers.** **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. **Perform arithmetic operations on polynomials *[Linear and quadratic]*** **A-APR.1** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. **A-APR.3.** Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. **NOT IN ORIGINAL TEMPLATE BUT IS EXPECTED BY PARCC TO BE TAUGHT AND TESTED*** **Create equations that describe numbers or relationships [Linear, quadratic, and exponential (integer inputs only); for A.CED.3 linear only]** **A-CED.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic	Explain why rational numbers and polynomials are closed under addition, subtraction, and multiplication? How do the key features of linear, exponential, and quadratic equations and graphs differ? What does factoring a quadratic expression reveal?	• ALEKS • Guided Notes • Group Work • Manipulatives (tactile and web-based) • Exploratory learning • Graphic Organizers • Edit and Assess • Peardeck • Deltamath • Desmos • Geogebra • Carousel Activities • Edulastic • Quizizz • Kahoot • Edpuzzle • Blooket • CK-12 • Illustrative Math • Project based learning • Center-based learning	• ALEKS topics • ALEKS Knowledge Checks • Quizizz • Warm Ups on ALEKS • Quizzes

functions, 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.★ **Interpret the structure of expressions *[Linear, exponential, quadratic]*** **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. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P. **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 $(x^2 – y^2)(x^2 + y^2)$. **Write expressions in equivalent forms to solve problems *[Quadratic and exponential]*** **A-SSE.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. **Content to be learned:** • Add polynomials utilizing			

prerequisite skills of adding integers and combining like terms. • Subtract polynomials utilizing prerequisite skills of distributive property, adding integers and combining like terms • Multiply polynomials utilizing prerequisite skills of distributive property, multiplying integers and monomials, and combining like terms • Create equations with real world applications involving polynomials and utilize their equation to solve for an unknown variable. • Identify coefficients, terms, and factors of an expression. • Find the greatest common factor of terms and utilize factoring to find an equivalent form of the expression • Identify the structure of a polynomial to determine which factoring method will help them to factor this expression. • Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. • Use the factored form of a polynomial to find the zeroes of the function.			

Resources:

- ALEKS program

Adapted from the Charles A. Dana Center