# Unit 1 - Creating and Interpreting Expressions and Equations Vision of the Graduate:

Common Core Standards and Content to Be Learned	Essential Questions	Instructional Strategies	Assessment Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
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.	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?	<ul> <li>ALEKS</li> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives     (tactile and     web-based)</li> <li>Exploratory     learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>
Content to be learned:  • Simplify expressions.  • Write expressions in equivalent forms.		<ul> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> </ul>	

Resources:

• ALEKS program

# Unit 2 - Solving Single Variable Equations and Inequalities Vision of the Graduate:

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.	<ul> <li>What are the possible number of solutions to an equation and to an inequality?</li> <li>How do units of measure guide accuracy and create meaning in problem solving?</li> <li>In what situations would it be useful and/or necessary to solve an equation for another variable within that equation?</li> <li>What is the process that you should follow to solve an equation for a given variable?</li> </ul>	<ul> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives (tactile and web-based)</li> <li>Exploratory learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> <li>Kahoot</li> <li>Edpuzzle</li> <li>Blooket</li> <li>CK-12</li> <li>Illustrative Math</li> <li>Project based learning</li> <li>Center-based learning</li> <li>ALEKS</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>

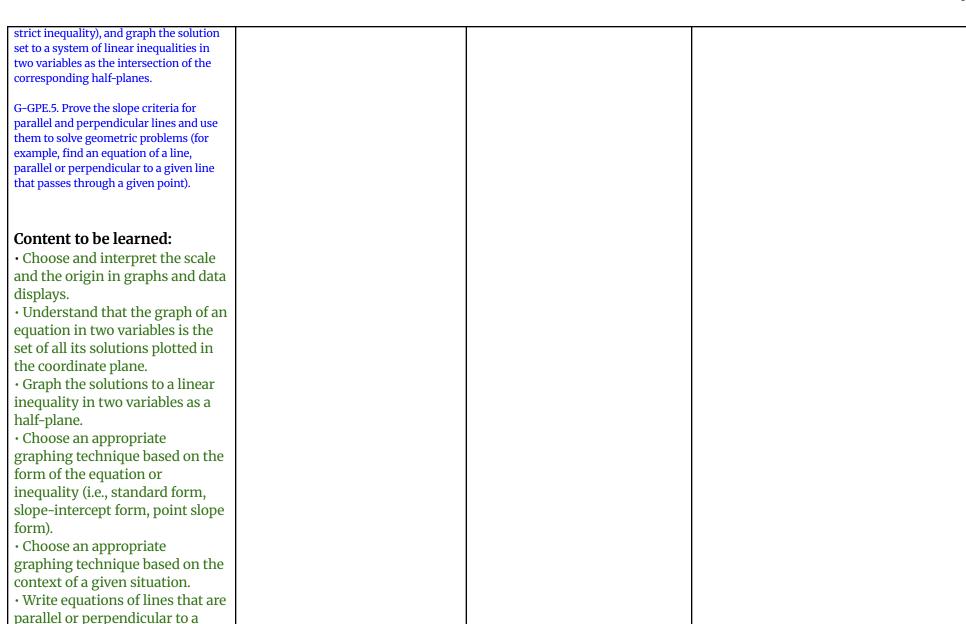


### **Resources:**

• ALEKS program

# Unit 3 - Graphing the Solutions to Linear Equations and Linear Inequalities in Two Variables Vision of the Graduate:

Common Core Standards and Content to Be Learned	Essential Questions	Instructional Strategies	Assessment Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
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	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?	<ul> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives (tactile and web-based)</li> <li>Exploratory learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> <li>Kahoot</li> <li>Edpuzzle</li> <li>Blooket</li> <li>CK-12</li> <li>Illustrative Math</li> <li>Project based learning</li> <li>Center-based learning</li> <li>ALEKS</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>



Resources: ALEKS program

given line and passing through a

given point.

### Unit 4: Interpreting Functions Vision of the Graduate:

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 $f$ is the graph of the equation, 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	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?	<ul> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives (tactile and web-based)</li> <li>Exploratory learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> <li>Kahoot</li> <li>Edpuzzle</li> <li>Blooket</li> <li>CK-12</li> <li>Illustrative Math</li> <li>Project based learning</li> <li>Center-based learning</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>

defined recordingly by f(0) f(1) 1 f(n : 1)		AT PIZO	1
defined recursively by $f(0) = f(1) = 1$ , $f(n+1)$	· ·	• ALEKS	
= $f(n) + f(n-1)$ for $n \ge 1$ .	· ·		
This is major and is assessed.	· ·		
	· ·		
Interpret functions that arise in	· ·		
applications in terms of the context.	· ·		
[Linear, exponential, and quadratic]	l de la companya de		
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; <del>end behavior; and</del>	l de la companya de		
<del>periodicity</del> .★	l de la companya de		
F-IF.5. Relate the domain of a function to its	l de la companya de		
graph and, where applicable, to the	l de la companya de		
quantitative relationship it describes. For	l de la companya de		
example, if the function h(n) gives the	l de la companya de		
number of person-hours it takes to	l de la companya de		
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.★	· ·		
xxxxxxx - 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.		
<ul> <li>Interpret key features of graphs and</li> </ul>		
tables of functions (i.e., intercepts, intervals		
where the function is increasing,		
decreasing, positive or negative, relative		
maximums and minimums, and		
symmetries).		
<ul> <li>Given key features of the functional</li> </ul>		
relationship, sketch graphs.		
Calculate and interpret the average rate		
of change of a function over a specified		
interval.		
<ul> <li>Estimate the rate of change</li> </ul>		
from a graph.		

Resources:

• ALEKS Program

### Unit 5: Building and Graphing Functions Vision of the Graduate:

Common Core Standards and Content to Be Learned	Essential Questions	Instructional Strategies	Assessment Formative Assessments (FA) Interim Assessments (IA) Summative Assessments (SA)
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.	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?	<ul> <li>ALEKS</li> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives (tactile and web-based)</li> <li>Exploratory learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> <li>Kahoot</li> <li>Edpuzzle</li> <li>Blooket</li> <li>CK-12</li> <li>Illustrative Math</li> <li>Project based learning</li> <li>Center-based learning</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>

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 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.		
<ul> <li>Graph exponential functions showing</li> </ul>		
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.		
<ul> <li>Write arithmetic and geometric</li> </ul>		
sequences with an explicit formula.		
• Use arithmetic and geometric sequences		
to model situations.		
<ul> <li>Identify the effect on the graph</li> </ul>		
of replacing $f(x)$ with $f(x) + k$ ,		
kf(x), $f(kx)$ , and $f(x + k)$		

Resources:

• ALEKS Program

# Unit 6 - Creating, Solving, and Graphing Systems of Linear Equations and Linear Inequalities Vision of the Graduate:

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-quadratie]  A-REI.5. Prove that, given a system of two	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,	<ul> <li>ALEKS</li> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives (tactile and web-based)</li> <li>Exploratory learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> <li>Kahoot</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>
equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system	and when is each method most efficient?	<ul><li>Edpuzzle</li><li>Blooket</li><li>CK-12</li></ul>	

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with the same solutions.	Illustrative Math	
<b>A-REI.6.</b> Solve systems of linear equations	<ul> <li>Project based learning</li> </ul>	
exactly and approximately (e.g., with	<ul> <li>Center-based learning</li> </ul>	
graphs), focusing on pairs of linear		
equations in two variables.		
Represent and solve equations and		
inequalities graphically [Linear and		
exponential; learn as general principle]		
<b>A-REI.11.</b> Explain why the <i>x</i> -coordinates of		
the points where the graphs of the		
equations $y = f(x)$ and $y = g(x)$ intersect are		
the solutions of the equation $f(x) = g(x)$ ;		
find the solutions approximately, e.g., using		
technology to graph the functions, make		
tables of values, or find successive		
approximations. Include cases where $f(x)$		
and/or $g(x)$ are linear, polynomial, rational,		
absolute value, exponential, and		
logarithmic functions.★		
A-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		
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inequalities to fit a given situation.		
<ul> <li>Solve systems of linear</li> </ul>		
inequalities graphically and		
understand that the solution to		
the system is the region where		
the graphs of the individual		
inequalities overlap.		

Resources:

• ALEKS program

# Common Core Standards Curriculum Map - (Mathematics / Math Workshop) QUARTER 4 Unit 7: Polynomial Operations and Factoring Vision of the Graduate:

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***	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?	<ul> <li>ALEKS</li> <li>Guided Notes</li> <li>Group Work</li> <li>Manipulatives (tactile and web-based)</li> <li>Exploratory learning</li> <li>Graphic Organizers</li> <li>Edit and Assess</li> <li>Peardeck</li> <li>Deltamath</li> <li>Desmos</li> <li>Geogebra</li> <li>Carousel Activities</li> <li>Edulastic</li> <li>Quizizz</li> <li>Kahoot</li> <li>Edpuzzle</li> <li>Blooket</li> <li>CK-12</li> <li>Illustrative Math</li> <li>Project based learning</li> <li>Center-based learning</li> </ul>	<ul> <li>ALEKS topics</li> <li>ALEKS Knowledge Checks</li> <li>Quizizz</li> <li>Warm Ups on ALEKS</li> <li>Quizzes</li> </ul>

Construction that describe construction
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
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. *
diffu 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) <sup>n</sup>
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

	T
the expression.★	
a. Factor a quadratic expression to reveal	
the zeros of the function it defines.	
Content to be learned:	
<ul> <li>Add polynomials utilizing</li> </ul>	
prerequisite skills of adding	
integers and combining like	
terms.	
<ul> <li>Subtract polynomials utilizing</li> </ul>	
prerequisite skills of distributive	
property, adding integers and	
combining like terms	
<ul> <li>Multiply polynomials utilizing</li> </ul>	
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.	
<ul> <li>Choose and produce an</li> </ul>	
equivalent form of an expression	
to reveal and explain properties	
of the quantity represented by	
the expression.	
<ul> <li>Use the factored form of a</li> </ul>	

polynomial to find the zeroes of the function.		
Resources:  • ALEKS program		