Ganado Unified School District
Algebra I

PACING Guide SY 2014-2015

Timeline & Resources	AZ CCRS - Mathematics	Essential Questions HESS Matrix	Learning Goal	Vocabulary Content/Academic
1st Quarter Unit 1 4 weeks	F-IF 3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers...	How can I recognize and write rules for number patterns ?	❖ I will recognize the patterns of a given series of numbers.	Sequence Terms of sequence Arithmetic sequence Common difference Geometric sequence Common ratio
	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.	What are the advantages and disadvantages of using recursive rule or an explicit rule in determining the nth rule of a sequence ?	❖ I write a function that describes a relationship between two quantities from tables, graphs, etc… ❖ I will be able to apply what I know about functions to real life problem.	Recursive rule Explicit rule
	F-BF 2. Write arithmetic and geometric sequences ... recursively and [arithmetic sequences] with an explicit formula, use them to model situations, and translate between the two forms.*	What are the advantages and disadvantages of using recursive rule or an explicit rule in determining the nth rule of a sequence ?	❖ I will write arithmetic sequences. ❖ I will write geometric sequences. ❖ I will recognize arithmetic and geometric sequences and apply these sequences in real world problems.	Recursive rule Explicit rule
Unit 2 Linear Equations and Inequalities 5 weeks	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.	How do you write an expression to represent a real world situation ?	❖ I will recognize parts of an expression.	Variable Algebraic expression Order of operations Verbal model

	A-CED 1. Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear ... functions*	How do you write equation and inequalities ?	❖ I will write equations and inequalities based on real-world situations. ❖ I will solve equations and inequalities.	Rate, unit rate Equation, inequality
	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.	How do you solve equation using addition, subtraction, multiplication and division ?	❖ I will verbally explain step-by-step procedures of equations. ❖ I will solve equations using appropriate mathematical properties justifying each step.	Inverse operations Equivalent equations Associative property Commutative property Identity Distributive property
Reading	Reading CCR 1: Read closely to determine what the text says explicitly and to make logical inferences from it.		Students will be able to read real-world situations and make inferences related to desired results.	
Writing	Writing CCR1: Using valid reasoning to support claims.			
2nd Quarter Unit 3 Reasoning with equations and inequalities 3 weeks	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.	How do solve equation with variable in both sides?	• I will understands the principles of equality and apply these principles step by step in solving equations.	Cross product Scale model Literal equation
	A-REI.10. Understand that the graph of an equation in two variables is the set of all solutions plotted in the coordinate plane, often forming a curve (which could be a line).	How do you graph linear equations in two variables?	• I will be able to reason and make interpretations of graphs, tables, and equations.	Linear equation Solution, graph of an equation in two variables x-and y-intercept slope and change of rate
2nd Quarter Unit 3 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	How do you represent function as tables, rules and graphs? How do you use graph of	• I will understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain	Domain, range Dependent variable Independent variable Intercept and rate of change

3 weeks		a function to solve real-world problems ?	exactly one element of the range • I will model relationships based on real-world data.	
	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....**	How do changes in linear equations and functions affects the graph ?	• Given a graph, I will be able to interpret its features as they relate to real-world interpretations. • Given real-world data as an expression or a table, I will be able to produce and interpret appropriate graphs, using technology when appropriate.	Domain, range Dependent variable Independent variable Intercept and rate of change
Unit 4 Linear Functions 6 weeks	F-LE 1. Distinguish between situations that can be modeled with linear functions [and with exponential functions]. a. Prove that linear functions grow by equal differences over equal intervals... over equal intervals.	How can you distinguish between real-world situation using linear, quadratic and exponential function ?	• I will be able to determine when a verbal description or table can be represented by a linear function.	Slope and rate of change Slope-intercept form Quadratic equation/function Properties of exponents Exponential growth and decay (graph)
	b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another....	How can you distinguish between real-world situation using linear, quadratic and exponential function ?	• I will understand the slope of a linear equation represents rate of change and that the y-intercept is the starting point.	Slope and rate of change Slope-intercept form y-intercept
	F-LE 5. Interpret the parameters in a linear ... function in terms of a context.	How do you use the language of Math to model linear relationships in real-world situations ? (slope and y-intercept)	• I will understand the effects of m and b in the equation y = mx + b when analyzing real-world situations using a linear model.	Slope and rate of change Slope-intercept form y-intercept
Reading	Reading CCR 1: Read closely to determine what the text says explicitly and to make logical inferences from it.		Students will be able to read real-world situations and make inferences related to desired results.	
Writing	Writing CCR1: Using valid reasoning			

	to support claims.			
3rd Quarter	AZ-HS.F-IF.A.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). [From cluster: Understand the concept of a function and use function notation]	How do I use function and models to understand relationship?	• I will understand the definition of function as applied verbally, as a table, as an equation, as a graph, and as ordered pairs. I can use functional notation and differentiate functional notation from notation used to express equations.	Domain and range Linear function Function notation Rate of change y-intercept constraints
	AZ-HS.F-IF.A.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. [From cluster: Understand the concept of a function and use function notation]	What is functional notation ?	• I will use functional notation and use functional notation to evaluate and interpret real-world problems.	Domain and range Linear function Function notation Rate of change y-intercept constraints
	AZ-HS.F-IF.B.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. [From cluster: Interpret functions that arise in applications in terms of the context]	How you apply concept of function to solve real-world problem ?	• I will be able to interpret graphs within the context of their real-world application and I will write equations and functions based on interpreting graphs of real-world situations.	Domain and range Linear function Function notation Rate of change y-intercept constraints
	AZ-HS.A-CED.A.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	How do you solve system of linear equations and linear inequalities using various methods ? How do you interpret the	• I will create equations and inequalities that model numbers and relationships in a real-world context.	System of linear equations System of linear inequalities Graph of system of linear equations Graph of a system of linear inequalities

	context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. [From cluster: Create equations that describe numbers or relationships]	graphs of the solutions		Solution system of linear equations Solution system of linear inequalities
	AZ-HS.A-CED.A.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. [From cluster: Create equations that describe numbers or relationships]	How do you rearrange formulas to highlights points of interest?	• I will create equations and inequalities that model numbers and relationships in a real-world context.	Variable Literal equation Formula
	AZ-HS.N-Q.A.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. [From cluster: Reason quantitatively and use units to solve problems]	How do you use rate and unit rate to understand real-world problem? How do I consistently choose unit ?	• I will choose units of measure consistently within a real-world context and I will make appropriate conversions between different units of measure.	Rate Unit rate
	AZ-HS.N-Q.A.2. Define appropriate quantities for the purpose of descriptive modeling. [From cluster: Reason quantitatively and use units to solve problems]	How do you use rate and unit rate to model real-world problem?	• I will be able to solve problems by evaluating models which use various quantities.	Rate Unit rate
	AZ-HS.F-LE.A.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). [From cluster: Construct and compare linear, quadratic, and exponential models and solve problems]	How do you write linear and exponential function given various real-world data ?	• I can write an equation based on real-world data from a table, a written description, or a graph.	Properties of exponents Zero exponent Negative exponent Rate of change(slope) y-intercept

Reading	Reading CCR 1: Read closely to determine what the text says explicitly and to make logical inferences from it.		Students will be able to read real-world situations and make inferences related to desired results.	
Writing	Writing CCR1: Using valid reasoning to support claims.			
4th Quarter	AZ-HS.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.*	How can I use the properties of exponents to explore real life problems such as exponential growth and decay ?	I will apply properties of exponents to simplify expressions.	Exponential function Exponential decay Compound interest Exponential growth
	AZ-HS.N-RN 2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	How do you use zero and negative exponents?	I will use the language of exponents and radicals to express real world Ideas.	Zero exponent Negative exponents Scientific notation Growth factor, growth rate
	AZ-HS.A-APR.A.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. [From cluster: Perform arithmetic operations on polynomials]	How do you add, subtract and multiply polynomial?	I will use the operations of polynomials to model trends and determine solutions such as areas of real world problems.	Monomial Binomial Trinomial Polynomial Degree Leading coefficient
	AZ-HS.F-LE.A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions. [From cluster: Construct and compare linear, quadratic, and exponential models and solve problems]	How do you graph quadratic function?	I will investigate real world problems such as suspension bridges using quadratic functions.	Quadratic function Symmetry Parabola Vertex Minimum value Maximum value

	AZ-HS.F-LE.A.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). [From cluster: Construct and compare linear, quadratic, and exponential models and solve problems]	How do you graph quadratic function?	I will investigate real world problems such as suspension bridges using quadratic functions.	Quadratic function Symmetry Parabola Vertex Minimum value Maximum value
	AZ-HS.F-LE.A.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. [From cluster: Construct and compare linear, quadratic, and exponential models and solve problems]	How can I solve real world problems such as falling objects?	I will solve quadratic equations using the square root and completing the square.	Completing the square Quadratic equation