Unit Title	Home on the Range – Part 1			Length of Unit	2 weeks

Focusing Lens(es)	Representation	Standards and Grade Level Expectations Addressed in this Unit	MA10-GR.HS-S.2-GLE.1 MA10-GR.HS-S.2-GLE.4

Inquiry Questions (Engaging-Debatable):	• Can all real-world situations be modeled with a function? (MA10-GR.HS-S.2-GLE.2-EO.b)

Unit Strands	Number and Quantity: Quantities Algebra: Creating Equations Functions: Building Functions Functions: Interpreting Functions

Concepts	Function, contexts, quantity, input, output, domains, range, generate, equivalent, exponential, properties of exponents, relationships, tables, graphs, equations, model, representations

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	**Conceptual**
Functions describe contexts where one quantity, an input, determines another, the output. (MA10-GR.HS-S.2-GLE.1-EO.a)	Given an input and output, how do you determine a rule? What notation is used to write a function? What does y=f(x) denote?	Why is only one output permissible for every input in a function? Why is possible to have two inputs for one output? Why are functions an important tool in mathematical modeling?
Mathematicians limit domains of a function to ensure both the domain and range make sense in a given context. (MA10-GR.HS-S.2-GLE.2-EO.b)	What is another name for the inputs of a function? Outputs? What is the relationship between domain and range of a function? How do you express domain and range?	How do you determine a reasonable domain and range for a context? Why is it necessary to constrain the domain and range of a function model?
Functions model relationships between quantities through tables, graphs and equations. (MA10-GR.HS-S.2-GLE.2-EO.b, d)	What are examples of linear, quadratic, and exponential contexts?	Why are two variable equations helpful in modeling a variety of contexts? Why do linear and exponential functions model so many situations?

Key Knowledge and Skills: **My students will…**	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Understand 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* and the graph of *f* is the graph of the equation *y = f(x)* (MA10-GR.HS-S.2-GLE.1-EO.a.i)
- Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (MA10-GR.HS-S.2-GLE.4-EO.a.ii)
- Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (MA10-GR.HS-S.2-GLE.1-EO.a.ii)
- Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (MA10-GR.HS-S.2-GLE.1-EO.b.ii)
- Determine an explicit expression, a recursive process, or steps for calculation from contexts including linear, quadratic, and exponential with integer domain. (MA10-GR.HS-S.2-GLE.2-EO.d.i.1)
- Describe the factors affecting take-home pay and calculate the impact. (MA10-GR.HS-S.1-GLE.2-EO.a.iv) *
- Design and use the budget, including income (i.e., net take-home pay) and expenses to demonstrate how living within your means is essential for a secure financial future. (MA10-GR.HS-S.1-GLE.2-EO.a.v) *

Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline. 　　EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*	
A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*The domain is the set of all values that can be used as an input in the function and the range is the set of all values that are possible outputs from a function.* *When using functions to model real world phenomena it is important to constrain the domain and range to inputs and outputs that make sense within the context of the model.* *Not all relationships are functions.*
Academic Vocabulary:	Input, output, relationship, limit, constrain, contexts, explain, create, determine, generate, tables, model, representations, graphs
Technical Vocabulary:	Coordinate plane, axes, set, function, quantity, domains, range, equivalent, exponential, properties of exponents, equations,

* Denotes a connection to Personal Financial Literacy (PFL)