Unit D - *Exploring Functions*

Overview

This unit explores functions, which are expressed as expressions, tables and graphs. Students review the properties of equality and inequality so that they are able to manipulate equations and inequalities to solve for missing inputs and outputs. Students review the coordinate plane, graphing points, and linear functions.

21st Century Capacities: Analyzing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS	Transfer:
MP1 Make sense sense of problems and persevere in solving them **MP2** Reason abstractly and quantitatively **MP3** Construct viable arguments and critique the reasoning of others **MP4** Model with Mathematics	*Students will be able to independently use their learning in new situations to...* 1. Manipulate equations/expressions or objects to create order and establish relationships. (Analyzing) 2. Represent and interpret patterns in numbers, data and objects. (Analyzing) 3. Justify reasoning using clear and appropriate mathematical language.

	Meaning:
CCSS.MATH.CONTENT.HSA.SSE.A.1 Interpret expressions that represent a quantity in terms of its context. CCSS.MATH.CONTENT.HSA.SSE.A.1.A Interpret parts of an expression, such as terms, factors, and coefficients. CCSS.MATH.CONTENT.HSA.SSE.A.1.B Interpret complicated expressions by viewing one or more of their parts as a single entity. CCSS.MATH.CONTENT.HSA.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. CCSS.MATH.CONTENT.HSA.CED.A.2 Create equations in two or more variables to represent	**UNDERSTANDINGS:** *Students will understand that:* 1. Mathematicians identify relevant tools, strategies, relationships, and/or information in order to draw conclusions. 2. Mathematicians apply the mathematics they know to solve problems occurring in everyday life. 3. Mathematicians create or use models to examine, describe, solve and/or make predictions. 4. Mathematicians use models to represent and make meaning of quantitative relationships.	**ESSENTIAL QUESTIONS:** *Students will explore & address these recurring questions:* A. How do expressions relate to tables and graphs? B. How can I use symbols of inequality or equality to model relationships? C. How can I use math to make decisions?

	Acquisition:	
relationships between quantities; graph equations on coordinate axes with labels and scales. CCSS.MATH.CONTENT.HSA.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 context. CCSS.MATH.CONTENT.HSA.REI.A.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. CCSS.MATH.CONTENT.HSA.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. CCSS.MATH.CONTENT.HSA.REI.D.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). CCSS.MATH.CONTENT.HSF.IF.B.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. CCSS.MATH.CONTENT.HSF.IF.B.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. CCSS.MATH.CONTENT.HSF.BF.A.1 Write a function that describes a relationship between two quantities.	*Students will know…* 1. How to clear denominators in an equation using the multiplication property of equality 2. How to solve basic rate problems 3. How to graph inequalities in one variable 4. How to write an inequality based on a graph 5. How to graph points in the coordinate plane 6. How to graph horizontal and vertical lines 7. How to find slopes of lines 8. That slope give the rate of change 9. Vocabulary: inverse operations, equation, equivalent equations, inverse operations, solution of an equation, least common denominator, rate, inequality, graph of an inequality, equivalent inequalities, coordinate plane, linear equation, slope, direct variation, coordinate plane, y-axis, x-axis, origin, quadrants ,ordered pair, x-coordinate, y-coordinate, horizontal line, vertical line, x-intercept, y-intercept, slope-intercept form, direct variation, constant of variation	*Students will be skilled at…* 1. Identifying a solution to an equation 2. Solving one-step equations and inequalities 3. Solving two-step equations and inequalities 4. Solving basic rate problems 5. Translating between language and algebraic expressions 6. Graphing points and lines in slope-intercept form on the coordinate plane. 7. Graphing horizontal and vertical lines 8. Solving direct variation problems by graphing or algebraically.