Unit 2 - *Equations and Lines*

Overview

In this unit students will understand that the way we solve equations is based on an understanding of the order of operations. There are certain equations that require more than just an algebraic step (absolute value requires a leap of logic). Literal equations are a great opportunity for students to hone their equation solving skills which will be beneficial in other classes, like science.

For writing equations of lines, students should get to the point where they no longer think of every problem as a unique case, but as all being basically the same, just slight variations. Students should appreciate the usefulness of all forms of lines, not just y = mx + b, and should be allowed to leave answers in any form. Students should leave the unit displaying confidence in their understanding of how slope can be interpreted in the real world.

21st Century Capacities: Analyzing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 1 Make sense sense of problems and persevere in solving them
MP2 Reason abstractly and quantitatively
MP4 Model with Mathematics
MP7 Look for and make use of structure

CCSS.MATH.CONTENT.HSN.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.

CCSS.MATH.CONTENT.HSN.Q.A.2
Define appropriate quantities for the purpose of descriptive modeling.

CCSS.MATH.CONTENT.HSA.CED.A.2

Transfer:

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. Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. (Analyzing,)

Meaning:

UNDERSTANDINGS: *Students will understand that:*

1. Mathematicians look for ways to generalize.
2. Mathematicians understand that placing a problem in a category gives one a familiar approach to solving it
3. Mathematicians use the order of operations to solve equations.

ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*

A. How do I know I've solved the problem right?
B. How do I interpret a linear model?
C. What have I seen in the past that might help me now?

	Acquisition:	
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. 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.LE.A.1.B Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. CCSS.MATH.CONTENT.HSF.LE.A.2 Construct linear given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). CCSS.MATH.CONTENT.HSF.LE.B.5 Interpret the parameters in a linear function in terms of a context. CCSS.MATH.CONTENT.HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. 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.	*Students will know…* 1. Solving absolute value equations requires logic reasoning and a complete understanding of the definition of absolute value 2. What it means to be a solution to an equation. 3. A linear model can be used to make predictions. 4. Slope represents a constant rate of change. 5. The distributive property a(b + c) = ab + ac can be used right to left (factoring) 6. Vocabulary: linear, literal, rate of change, extraneous solution,	*Students will be skilled at…* 1. Solving linear single variable equations and inequalities 2. Solving absolute value equations 3. Solving literal equations 4. Writing equations of lines 5. Interpreting linear equations 6. Solving systems (optional) 7. Using interval notation 8. Factoring out the GCF to solve an equation