Name: Samuel Simpson

Grade level(s): Math 7th & 8th

Objectives: Graph linear equations using a graphing calculator. Observe the effects of opposite coefficients and adding a constant to $y = ax$. Complete tables and answer questions using equations, tables, and graphs.

Mathematical Concept: <u>Mathematical Reasoning 1</u>. Students use mathematical reasoning to analyze mathematical situations, make conjectures, gather evidence, and construct an argument. • use models, facts, and relationships to draw conclusions about mathematics and explain their thinking. • use patterns and relationships to analyze mathematical situations. • justify their answers and solution processes. • use logical reasoning to reach simple conclusions. <u>Operations 3</u>. Students use mathematical operations and relationships among them to understand mathematics. • add, subtract, multiply, and divide whole numbers. • know single digit addition, subtraction, multiplication, and division facts.

Lesson Overview: Students use a graphing calculator to explore lines. Students explore pairs of equations using the standard window, and they look at relationships between linear equations and their graphs, considering what happens when equation have positive or negative coefficients for x.

What Students will:

Know: How to enter equations on a graphing calculator.

Understand: The relationship of the coefficient on an equation and graph.

Be able to do: Predict what the graphs of other pairs of equations will look like.

Activating Learning Strategies: (Learners mentally activity): Re/introduce how to complete a table and locate points on a coordinate grid.

Cognitive Teaching Strategies: (Distributed guided practice &/or Distributed summarizing in pairs; graphic organizers; etc.)

- Limited lecture
- Students work alone and/or in pairs

Launch:
Students having never used a graphing calculator before will be shown to graph basic

equations. They will than experiment with this lesson. Each student will complete the Handout – Using a Calculator to Explore Lines.

The Handout will require students to:

1. Enter an equation into a graphing calculator as Y_1, to see a graph of the equation and make a sketch of the graph they see.

2. Predict how the graph of an equation with a positive and negative coefficient will look.

3. Compare how are the graphs are alike and different.
4. Complete the tables for each of the equations prior to view the table value list in the calculator.

5. Experiment with additional sets of equations. Looking at their graphs and the tables.

Summarizing Strategies:

6. As an extension, students will be required to predict what the graphs of other pairs of equations will look like and give additional pairs of equations that will have a similar relationship.

Material: Graphing calculators and Using a Calculator to Explore Lines – Handout