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Lesson Title: Graphing Calculator

Suggested Grade Level: 8th

Estimated Lesson Time: 65 minutes

Student Prior Knowledge:

 Students know what an equation is and how to solve equations using order of operations. Students also know the formula y=mx+b and about the slope of a line. Also they know how to graph a line on a paper graph.

Standards:

MA.8.A.4.2 - Solve and graph one- and two-step inequalities in one variable.

Goal:

 Students will use a graphing calculator to graph a slope of the line in the form of y = mx + b. This will allow students to use calculators is easily graph equations and visualize the slopes and intersections of the lines.

Learning Objective:

 Using a graphing calculator, students will effectively graph an equation and find the intersection of two lines.

Resources:

 Smart Board

 Prezi

 Graphing Calculator

 \*I would like to use an additional resource, but I am unsure of the availability of different resources in the classroom.

Procedures:

1. **Introduction**- I will start the class by introducing myself, explaining that I am a student of the University of Florida majoring in Information Systems with a minor in Education. I will say that I will be teaching for the class period and that we will be using graphing calculators. (2 minutes)
2. **Review**-I will write an equation on the board and ask students to explain the equation and tell me what the equation is for and what each variable stands for.

y = mx + b

This is an equation of a slope of a line.

m is the slope of the line

b is the y intercept

I will then pull up a picture of an empty graph on the smart board. I will write 3 equations on the smart board. I will graph the first equation on the empty graph, explaining the 3 key points are finding the y intercept, plotting 2 points on each side of the y intercept, and connecting all the points. I will then ask 2 students to come up and graph one of the equations on the empty graph. Once they have done that, I will go over the graphs with the class to see how the students did. With each equation I will make sure find the y intercept, plot points, and connect the points to make a line.



Equation examples-

 y = 3x + 1

 y = 1/2x + 3

 y = -2x + 4

I will then explain that what we just reviewed on the smart board, we will now do on a graphing calculator. It is very easy if you remember the three steps to plotting a line: 1) finding y intercept 2) plotting 2 points on both sides of y intercept 3) connecting the points (10 minutes)

1. **Review Game**- We will play a basketball game online. I will bring it up on the Smartboard and have the students answer the questions by raising their hand. I will ask them to get out a scratch sheet of paper in order to answer the question. I will call on the student of an answer. If the student answers correctly, I will have them come up and shoot the basket on the game. (10 minutes) http://www.math-play.com/slope-intercept-game.html
2. **Distribute Calculators**- I will pass out graphing calculators to the class if the students do not already have them. I will say that I cannot explain how to use all the functions of a graphing calculator in on class period, but that I will show them how to do the basics in order to successfully graph an equation of a line. (3 minutes)
3. **Explanation of graphing line** - I will open up my Prezi presentation (*The presentation uses an example problem to go through the explanation of using the calculator.)* I will start by showing the students how to turn on and off the calculator.

On- on button

I will then explain the use of the 2nd key. In order to accomplish something that is not on a button but is written about the button in yellow, you press the second key and then the button in order to accomplish the specific task.

 Example- 2nd On = turning calculator off

*(As I go through this part of the lesson, I will be explaining the steps using the equation y = 2x+1)*

Then I will tell students to press the Y= button. This will take you to a screen that you will enter in your equations. You must enter in the equations in the form of y=mx+b. You do not have to enter the y. You enter the slope, the x (X,T,Θ, n button), + , then the y intercept.

Next to set the graph, I will explain it two ways. First you can do a standard window by pressing ZOOM 0 . This will make the window be -10 to 10 then for the x and y axis. Also the window with the graph will automatically open, but if you want to graph it from the Y= screen, you press the GRAPH button. I will also explain that Zoom In and Zoom Out allow you to zoom in and out of the graph. The second way to set the window is to press the WINDOW button. This will allow you to adjust your window to the length of axis of your choice (if you want it bigger or smaller). I will explain the Xmin, Xmax, Ymin, and Y max. In order to have the (0,0) point, your minimums must be negative numbers and your maximums must be positive number. (10 minutes)

1. **Example problem**- I will go through all of the steps that I just explained with the class using 2 example problems. I will ask the students to follow along as I go through the steps. I will do the steps using an equation with a positive slope and a negative slope. I will also say that the graph on the calculator will show all of the equations that you have entered into the Y= screen. *(I will make sure that the two example equations have an intersection point)* ( 10 minutes)

Before starting the example problem, I will make sure to ask the students to clear their y= screens.

1. **Intersection-** Next I will explain how to find the intersection points of the two lines for the example equations. I will tell the students to go to the graph screen, the press 2nd TRACE. This will take you to the *calc* page. I will say to press 5, which is the intersect option. Next, make sure the point is on one of the lines you want to find the intersection with. The screen says *First curve*? Press ENTER. Make sure the point is then on the second curve. The screen says *Second curve*? Press ENTER. Next move the cursor on the screen to guess where the point of intersection is. You can skip this step. The screen says *Guess*? Press ENTER. The screen will then show you the point of intersection with the X and Y coordinate. I will then go through another example intersection problem with the class. (10 minutes).
2. **Closing**- I will pass out a worksheet with a review of all the steps for the problems. This will help the students remember the order of steps and the buttons to press, since they have never used calculators before to solve this kind of problem. I will then pass out another sheet with some example problems that the students can work on for the remainder of class. I will thank the class for having me as a guest teacher. (10 minutes or remainder of class).

Assessment

 Since I am only teaching one day in the class, I will talk to the teacher if she wants to use this lesson as just an explanation or if she wants to assess the students understanding of the topic on another day. For the sake of time for this lesson, I will not perform any form of assessment for this class.