Missy McCarthy CEP 805 Online Resource Library Lesson Plan 5/8/11

Modeling and solving a system of Linear Equations using graphing calculator technologies

**Course:** Algebra 1

**Concept / Topic To Teach:** Students will learn how to use a graphing calculator to represent data via a table or linear function and find the solution (intersection).

**Common Core State Standards:**

A.REI.5, 6, 7 - Reasoning with Equations and Inequalities

Solve systems of equations

Linear-linear and linear- quadratic

Represent and solve equations and inequalities graphically

**Students will:**

* Work with a partner to represent and solve a problem either graphically, by using a table, or by writing a system of equations and solving algebraically.
* Transfer what they do using paper and pencil to the online graphing calculator.
* Find and interpret the solution to their problem and draw conclusions about the solution to a system of equations.

Required Materials:

* Colored Pencils
* Graph paper
* Internet access
* Notecards
* [Link to online graphing calculator](http://my.hrw.com/math06_07/nsmedia/tools/Graph_Calculator/graphCalc.html)

Step-By-Step Procedures:

* Divide students into pairs and randomly distribute a scenario to each pair of students.
* Allow students approximately 10 – 15 minutes to find a solution to the scenario posed and answer the question.
* Choose pair from each of the scenarios to share their solutions with the class. Try to choose groups that solved in a variety of ways (tabular, graphically, algebraically, etc).
* Introduce students to the graphing calculator technology.
* Work through a different scenario using the technology as students follow along. Be sure to illustrate the intersection feature and the table feature. Students may need to adjust the window settings for their scenarios.
* Allow students time to use the technology to solve and verify their solutions.

Closure (Reflect Anticipatory Set):

Provide students with a notecard and ask them to answer the following questions.

1. What are the various methods for solving a system of equations?
2. What are the advantages and disadvantages for using each method?
3. What method makes most sense to you? Might this change if the scenario changes?
4. Is it possible for a scenario to have no answer/solution? Can you think of when this would be possible?

Students would submit this notecard before leaving for the day.

Plan For Independent Practice:

Use the [Algebra Worksheet Generator](http://www.math.com/students/worksheet/algebra_sp.htm) to create worksheets for students to practice solving systems using the graphing calculator at home.

Scenario #1: Your family is moving this weekend. You have a 4-bedroom , 2-story home that you have lived in since the day that you were born. There is lots to move so you needed to hire a moving company to. When looking through the telephone book, you found 2 moving companies that looked professional and that you’ve heard about from other family and friends. When you called to talk to them and ask about their rates, this is what each reported:

Company A: Moving Made Easy

2 professional movers

1 Large Truck

They charge $150 to secure the move and $25 per hour for the movers.

Company B: iMove

2 professional movers

1 Large Truck

They do not have a security fee, but they do charge

$50.00 per hour for the movers.

Your decision: With a partner, launch and investigation to decide which company is best. Find out how many hours you’d have to move to justify going with one company over the other. Be sure to explain how you reached your conclusion. You can use a graph, table, equations, or any other method, but be sure that you have mathematical justification for your answer.

Scenario #2: Your parents have finally decided to get you a new cell phone. You’ve either gone without one or have been using your brothers old phone which Is ANCIENT! You have begun to research phones and plans. You have to stay with Verizon because that is what your parents use, but you’ve found a good deal with T-Mobile as well. Here’s what you have found.

Company A: Verizon Wireless

You get a new Motorola Krave.

Monthly plan: $25 (which pays for texting, free long distance, unlimited nights and weekends), but you pay $.05 per minute for anytime minutes.

Company B: T-Mobile

You get a new Motorola Krave.

Monthly plan: $15 (which pays for texting, free long distance, unlimited nights and weekends), but you pay $.10 per minute for anytime minutes.

Your decision: With a partner, launch and investigation to decide which company is best. Find out how many minutes you would have to use each month to justify going with one company over the other. Be sure to explain how you reached your conclusion. You can use a graph, table, equations, or any other method, but be sure that you have mathematical justification for your answer.

Scenario #3: You’re planning to make a photo book for your mother for her birthday. It’s in late December and you don’t have much time to put it together. After doing a quick internet search, you’ve found two sites that will allow you to upload your photos and make a bound, hardcover book. Each site has great graphics and allows you to add text to each page. Here’s what you’ve found:

Company A: Blurb.com

25-page 7x7 storybook

$30.00 plus $1.50 for each additional page.

Company B: Picaboo.com

25-pag, 7x7 storybook

$40.00 plus $1.00 for each additional page.

Your decision: With a partner, launch and investigation to decide which company is best. Be sure to explain how you reached your conclusion. How many pages would you have to make to justify going with one company over the other? You can use a graph, table, equations, or any other method, but be sure that you have mathematical justification for your answer.