

## **CELL PHONE PLANS LESSON – developed by R. Minaya, V. Rodriguez & L. Tran**

**Grade Level and Course:** 9<sup>th</sup>-grade Algebra 1

**Time Frame:** One period or 45 minutes

### **Content Objectives:**

- Given graphs, students will be able to interpret the mathematical data and information.
- Students will be able to determine and reason through how an equation can be used to represent the information presented by a graph.
- Given two cell phone plan choices, students will be able to reason about which one is the more appropriate choice.

### **Language Objectives:**

- Student will use the following key vocabulary words to describe characteristics of a graph and articulate the real world/contextual meaning of the graphs.
- *Key Vocabulary:* increase, decrease, intersection, steeper, y-intercept, equation
- New vocabulary: interpret

On board:

I will be able to use these vocabulary words to describe a graph.

I will be able to use these vocabulary words to explain what a graph means

### **Begin lesson:**

- Introduce the activity to students. Get a poll on what type of cell phone plan students have – prepaid or monthly? Even though many students may have prepaid, at some future point, they may want to start a monthly plan with a phone company. How can they decide? What do cell phone companies do to try to get them as customers? Play two different cell phone company commercials to illustrate this point to students.
- Commercials:
  - <http://www.youtube.com/watch?v=BREOpoGUeLc>
  - <http://www.youtube.com/watch?v=a3eJmZW3ojI>
  - [http://www.youtube.com/watch?v=cwKeDAEr\\_po&feature=related](http://www.youtube.com/watch?v=cwKeDAEr_po&feature=related)
- Write out the content and language objectives (agenda) for the lesson on the board. Go over these with students before starting the lesson. Encourage students to use the vocabulary words found in the language objectives when verbalizing and writing explanations.

### **Graph Observations:**

- Tell students that one method many companies do to try to “prove” that product or plan is better is to present data on graphs. Pass out a graph with one line to students. This graph represents a particular plan that Verizon Wireless carries. Explain that Verizon Wireless wanted to make a graph to compare their charges with other phone companies. We need to learn how to interpret this information so that we are not

deceived and can make a good decision about which plan to use. For now, let's just take a look at their graph for a cell phone plan that allows us to use 450 minutes per month. For each minute we go over, we are charged some more money. Let students brainstorm and write down observations of the graph individually by responding to Questions 1 and 2 on the Verizon plan worksheet.

- When students are done, ask some students to share their responses with the class. Have a discussion on interpreting data from a graph. Other questions to consider:
  - What is the y-intercept?
  - What does the y-intercept tell us about the charges for the cell phone plan?
  - How much will Verizon Wireless charge us a month for using less than 450 minutes?
  - Possibly ask for estimate of how much they charge per extra minute.

### **Graph Interpretation:**

- Now, tell students that sometimes, companies will compare their charges with other cell phone company charges. Hand out the advertisement with the two lines on the graph. Verizon Wireless, to get people to choose their plan, made a graph with their charges and Cingular Wireless charges. Again, in real life, when we need to make a choice, we need to be able to read the graph and decide which one is the better choice.
- Let students work with a partner in order to answer Questions 1 and 2 on the Verizon and Cingular plan worksheet. If students have passed the group quiz, tell students to work on the next question.
  - Check Point 1:
    - Listen for students to reason that the choice will depend on how many minutes the friend will use for each month. If the friend thinks that he/she will not go over by many minutes, then the Cingular plan would be more appropriate since the set fee per month is cheaper. However, if the friend is concerned about going over many minutes, then the Verizon plan will be the more appropriate choice.
    - Follow-up questions:
      - What does the intersection of the two lines tell us about the charges for the plans?
      - Can you make any predictions? Which plan do you think will be more expensive if you go over by more than 40 minutes? How do you know?
- Ask students to share their answers with the rest of the class. How would we all decide on which plan to choose? Can you compare how much each company charges for each extra minute used? Which plan charges more? How do you know this?
- Discuss question 3 with the class. Have a student read the problem out loud. On the board, write down what we do know and what we don't know. Guide students in answering this question.
- Give students sometime to read question 4. Have a whole-class discussion on how to represent the charges for the Verizon plan using an equation. Which of the equations can be used to represent the charges for that particular Verizon plan? How do you know?

- Have each pair complete questions 5 and 6 on their own. Explain to students that they need to discuss their reasoning for their answer because there will be a group quiz afterwards! Students are not allowed to move on to the next question unless they have called a teacher over and passed the group quiz. When students pass the group quiz, instruct them to continue and work on the last question.
  - Check Point 2:
    - Listen for a detailed explanation on how to determine the charge for each extra minute used as well as students' accurate reasoning on why the chosen equation represents the charges for the Cingular plan.
    - Follow-up questions:
      - How would my equation change if the charge for each extra minute was \$0.75? What if the set fee was \$50. How will this change my equation?
      - Now that you know how much each company charges for each extra minute, can you explain why the line for the Cingular plan is more steep or increases faster than the Verizon plan?
- When all students are done, have a couple of students share their responses to the final question. Before this, remind students about group norms. Reflect on what makes a good math explanation with the students.

**Closure:**

- Go over the content and language objectives with students. Get students' feedback on what we covered or did not cover. Any remaining questions?