MRS. GAWLIK/MRS. CACHIA Lesson Outline (TWO DAYS)

Grade/Subject: 8th Grade Mathematics **Monday, September 22, 2014/Wednesday September 24, 2014**

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| **Content Standard:****Understand the connections between proportional relationships, lines, and linear equations.** * 8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
 | **ELP Standard:**English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics. |
| **Content Objective:**I can demonstrate application of proportional relationships, interpreting the unit rate as slope by constructing mathematical models.  | **Language Objective:**I can write to model slope using mathematical models.  |
| * TARGET STATEMENT:

 **I CAN**1. Find a linear function that is a good model for a set of data
2. Measure the accuracy of that model with residuals
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| **Key Vocabulary:**Independent and Dependent variable, linear relationship, nonlinear relationship, x-axis, y-axis, variables, function, mathematical model, residual**HOTS (Questions):** * Once you have drawn the line, how do you find the slope and the y-intercept? (Find the slope by choosing two points on the line and finding the ratio of rise to run. Find the y-intercept by estimating the coordinate of the point, where the line crosses the y-axis.)
* How can you compare the accuracy of two different possible modeling lines? (You can visually compare how close the lines come to their data points, or you can use the equations of the lines to calculate residuals and compare the lines exactly.)
 | **Content Specific: (Whole class completion of Question A, Problem 2.1)*** Do you think connecting the first and last points in a data set will always give a line that fits the pattern? (No, the line might not come close to several other points. You need to draw a line that connects the most points).

**General Terms:** * What directions would you give someone to help him or her draw a mathematical model? (Draw a line that seems to lie along the trend of the points.)
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| **Visuals, Materials, & Text**TEXT: Thinking with Mathematical Models TextVISUALS: LAUNCH video of a painter painting a bridgeMATERIALS: Accessibility Labsheet 2.1 A/B; Teaching Model 2.1 A-C of Modeling Linear Data Patterns |

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| **Building Vocabulary and Concept Knowledge/ Structured Conversation and Writing****(Processes, Stems, and Scaffolds)*** A mathematical model is an \_\_\_\_\_\_\_\_or a \_\_\_\_\_\_\_ that describes, at least approximately, the relationship between two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* To make a mathematical model, \_\_\_\_\_\_\_\_\_\_\_, plot the \_\_\_\_\_\_\_\_\_\_\_\_points, and when the \_\_\_\_\_\_\_\_\_show a pattern, find the \_\_\_\_\_\_\_\_of a line or curve that fits the trend in the \_\_\_\_\_\_\_\_.
* A\_\_\_\_\_\_\_\_\_\_\_\_allows you to make reasonable guesses for values between and beyond the data points.

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the error calculated by finding the difference between an actual data point and the value that a model for the data predicts. | **Reviews & Checks for Understanding****(Response Signals, Writing, Self-Assessment, Student Products, etc.)*** If you have to make predictions from a linear model, which is more helpful, the equation or the line? (The equation gives exact answers while the graph gives a nice picture of the relationship.)
* What are the advantages of having a linear model for your data set, rather than just a set of individual data points? (If you have a linear model, you can use it to predict data points that are not in the table or graph. Another advantage is that you can see a general trend and use an equation to help communicate that trend.)
* Listen to student responses to questions, walk around and observe individual and group work.
* Make sure students are making the table correct and labeling the x and y axis correctly.
* Make sure students are making the graph correctly and using correct labeling and numbering of the x and y axis (Question C).

**Accommodations** * **Partners, small groups, master copy of table and graph**
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| **Wrap up/Ticket Out*** Today I learned…
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**Tuesday, September 23, 2014**

**(Math Department Meeting-Guest Teacher)**

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| Assessment: Additional Practice Page 4-5, question 5-7 |

**Thursday September 25- Friday September 26, 2014**

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| **Content Standard:****Understand the connections between proportional relationships, lines, and linear equations.** * 8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
 | **ELP Standard:**English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics. |
| **Content Objective:** I can demonstrate evaluation of slope by solving linear equations with rational number coefficients.  | **Language Objective:**I can write to answer questions about slope using verbal, numerical, or graphical information. |
| * TARGET STATEMENT:

 **I CAN**1. Write an equation for a linear function using a graph
2. Write an equation for a linear function for a table
3. Write an equation for a linear function for two points
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| **Key Vocabulary:**Independent and Dependent variable, linear relationship, nonlinear relationship, x-axis, y-axis, variables, function, mathematical model, residual, slope**HOTS (Questions):** * What do you know about the table and graph of a function with the equation y=3x+2?
* What do you think the numbers 3 and 2 mean? (3 is the slope/constant rate of change and 2 is the y-intercept/starting value)
 | **Content Specific:** * How do you identify the slope and the y-intercept of a line from its graph? (The y-intercept is where the line crosses the y-axis.
* One way slope can be determined is to identify a whole number rise. In question A, the rise (y) would be 3 and associated run (x) would be 2. So the slope would be 3/2 or 1.5)
* How would you identify the slope and the y-intercept of a line from a table? (When x=0, the associated y-values is the y-intercept.)
* If x=0 is not in the table, the slope is determined by identifying the rate of change, which in the case of the graph for part 2 of question A is 1/2x or .5x.
* What information do you need to identify the slope of a line and/or other points on a line? (You need the coordinates of two points on the line so that you can find the rise and the run: y2-y1/x2-x1.
* How do you use slope and y-intercept to find the equation of a line? (To write the equation of a line, substitute the values for slope for m and the value of the y-intercept for b in the standard equation y=mx+b.

**General Terms:**  |
|  **Visuals, Materials, & Text****TEXT:** Thinking with Mathematical Models**VISUALS:** None**MATERIALS:** Labsheet 2.2A (Graphs-1 per group), Labsheet 2.2B (Tables-one per group) | **Accommodations** **Partners, small groups, master copy of graphs** |
| **Wrap up/Ticket Out*** Today I learn…..about writing an equation for a table, a graph, or two points.
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MONDAY, SEPTEMBER 22/WEDNESDAY, SEPTEMBER 24

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| **Content Objective:**I can demonstrate application of proportional relationships, interpreting the unit rate as slope by constructing mathematical models.  | **Language Objective:**I can write to model slope using mathematical models.  |

THURSDAY AND FRIDAY, SEPTEMBER 25-26

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| **Content Objective:** I can demonstrate evaluation of slope by solving linear equations with rational number coefficients.  | **Language Objective:**I can write to answer questions about slope using verbal, numerical, or graphical information. |