Krug Chemistry – Deep Run Daily Planning Guide

Date of Lesson: Q1 Day 6 – Graphing, Paper Clip Lab

Topic /Big Questions: (Question Stems & Question Creation Chart)

- **How can I interpret a line graph?**
- **What do the slope and y-intercept represent?**
- **What trends do I see in line graphs?**

State SOL	Unpacking the Standards (Video explanation shown at 3:18)
CH 1 d, e, g - j	d) manipulation of multiple variables, using repeated trials; e) accurate recording, organization, and analysis of data through repeated trials; g) mathematical manipulations including SI units, scientific notation, linear equations, graphing, ratio and proportion, significant digits, and dimensional analysis; h) use of appropriate technology including computers, graphing calculators, and probeware, for gathering data, communicating results, and using simulations to model concepts; i) construction and defense of a scientific viewpoint; and j) the use of current applications to reinforce chemistry concepts.

Visible Learning (For the three items with asterisks*, think from a student perspective. Use simple language)

***What am I learning today?** Types of Graphs and How to Interpret Line Graphs

***Why is it important?** Chemists use graphs to see trends and extrapolate information.

***How will I know I've learned it?** I will be able to define the slope, y-intercept, type of trend, and extrapolate data that is not shown on the graph.

Differentiation strategies:

White Board Graphing Activity – student groups will create graphs based on given data

Paper Clip Lab – students will use Excel to create graphs based on # of paper clips in film canisters

Accommodations and/or modifications are being met for students with IEP's/504's.

Access to all materials on Schoology; frequent checks for understanding; working in small groups

Daily Plan/Sequence of Instruction:

Optional Opening or Closing: "Intro to Graphs" Power Point is a silly look at line graphs, bar graphs, and pie charts.

White Board Activity – Teacher will pass out laminated note cards containing different scenarios in order for students to create graphs based on the given data. (Some data will require line graphs, but other data can use a pie chart or bar graph.) Teacher will use Modeling Instructional CER techniques to ask students: Why did they choose the type of graph they did? What trends can they see? Did different group with the same information make a similar graph or

did they make a different type of graph and why?

Paper Clip Lab – Students will be given film canisters that have been glued shut. The canisters will have numbers on top that show how many paper clips are inside. (Number of paper clips should be somewhat random. For example, Group 1 may be given canisters with 2, 5, 9, 10, and 17 paper clips. This will be used to teach the importance of graphing with equal intervals.) Students will use Microsoft Excel to record **# of paper clips** (x-axis) **and total mass of canister** (y-axis) in a data table. Teacher will guide students with how to use the graphing tools in Excel to create a line graph that shows equal intervals, axis titles, graph title, trend line, and equation of trend line. Students will then answer post lab questions defining the independent variable, dependent variable, slope, and y-intercept. For extrapolating data not shown on graph, teacher can ask students to calculate the total mass of a container with 25 paper clips. Teacher can also give students a canister with an unknown # of clips. Students must record the mass and use the equation of the trend line to determine the unknown # of clips.

Assessments (List all formative/summative assessments used to check for understanding during this lesson. Summative assessments may occur during a different class period.):

White Board Activities (formative)

Paper Clip Lab (summative)

After assessing today's lesson are you and your students comfortable moving forward with your next objective?

Yes - Students will self-evaluate understanding of types of graphs in White Board Activity

No, remediation required to proceed – If students fail the Paper Clip Lab, they can come to One Lunch to get help and earn partial credit by making corrections.

Teacher reflection: Use the phrase **DRY MIX**. **D**ependent variable **R**esponds to change and goes on the **Y** axis. The **M**anipulated variable chosen by **M**e is called the **I**ndependent variable and it goes on the **X** axis. Students have already learned about line graphs in math class, but they have trouble understanding that the slope represents the mass of one paper clip and the y-intercept represents the mass of the empty canister.