UNIT OF STUDY

Title: "Greeting with Graphs" (Unit 11) **Subject/Course**: Integrated Algebra B Part 1 **Length:** 2½ weeks

Topic: Ratios/ Data Interpretation **Grade:** 9 **Designer:** Jonathan Foresee

UNIT GOALS AND EXPECTATIONS

IMPORTANT CONCEPTS/UNDERSTANDINGS:

- Data can be collected from observations & is gathered for the purpose of explaining characteristics of the sample from which the data was collected
- The slope determines the steepness & direction of a line
- Scatter plots can be used to represent collected data between two variables
- A complete circle graph must contain the sum of 100%
- A percentage, when written as a proportion, must have the number divided by 100

ESSENTIAL QUESTIONS:

- How is data collected?
- How do I interpret a set of data?
- Are there patterns in a set of data?
- How do graphs help to explain real-world situations?
- How do rates, ratios, & percents help to explain real-world situations?
- How does slope help explain real-world situations?

STUDENT LEARNING EXPECTATIONS:

- DIP.5.AI.1 Construct and use *scatter plots* and *line of best fit* to make *inferences* in real life situations
- DIP.5.AI.9 Recognize patterns using *explicitly* defined and *recursively* defined linear functions
- DIP.5.AI.10 Communicate real world problems graphically, algebraically, numerically and verbally
- SEI.2.AI.1 Solve multi-step equations and inequalities with rational *coefficients* numerically (from a table or guess and check), algebraically (including the use of manipulatives), graphically, technologically
- SEI.2.AI.5 Solve real world problems that involve a combination of rates, *proportions* and percents
- SEI.2.AI.8 Communicate real world problems graphically, algebraically, numerically and verbally
- LF.3.AI.4 Identify *independent variables* and *dependent variables* in various representational modes: words, symbols, and/or graphs
- LF.3.AI.5 Interpret the rate of change/*slope* and intercepts within the context of everyday life (Ex. telephone charges based on base rate (*y-intercept*) plus rate per minute (slope))
- LF.3.AI.6 Calculate the slope given: two points, the graph of a line, the equation of a line
- LF.3.AI.7 Determine by using slope whether a pair of lines are parallel, perpendicular, or neither
- LF.3.AI.9 Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa

SPECIFIC DECLARATIVE KNOWLEDGE – What I know

SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do

Vocabulary: • Coordinate Plane • Ordered Pair • Origin • Quadrant • Scatter Plot • Slope • x & y – Axis • x & y – Coordinate • x & y – Intercept • Percent • Rate • Ratio • Proportion • Variable • Equation • Linear Equation	• Select appropriate survey topic • Collect numerical & categorical data using, observations, or experiments • Select an appropriate title for the scatter plot • Draw an axis and choose proper increments or intervals • Find appropriate labels for both axis (x & y – axis) • Construct line plots/ scatter plots • Interpret graphs & use information to draw appropriate conclusions • Make predictions based on data • Solve problems in relation to real-world problems • Justify conclusions based on data • Determine the slope when given: two points, a graph, and an equation • Determine the x & y – intercepts when given: a graph, and an equation • Apply the concepts of ratios/ percents to real-world problems

UNIT ASSESSMENTS
(Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)

- 2 Open Response prompts requiring students to interpret graphs, slopes, & equations.
- 1 Open Response prompt requiring students to interpret coordinate changes & intercepts.
- 1 Open Response prompt requiring students to analyze a circle graph & its percentages.
- 1 Open Response prompt requiring students to apply a given rate for two subjects to an expanded & slightly altered scenario.
- 1 Scatter Plot/ Oral Presentation on some concept with data collected over a two week period.

Traditional Assessments:	**Other Evidence of Learning:**
• Multiple Choice Quizzes over: rates, ratios, percents, graphing, coordinates, scatter plots, slopes, & intercepts • Unit Test over each topic mentioned above • Matching Test over Unit Vocabulary	• Daily Informal Assessment via In-Class Teacher Questioning & Observation • Nightly "Homelearning"

ACTIVITIES AND LEARNING EXPERIENCES	**Resources**
• Use the 4-Step Vocabulary process to introduce key words from the unit • 4-Step Vocabulary Group Work • Data Collection Project (students will collect data, make & interpret scatter plots, and foresee what will happen in the following week) • Oral Presentation of Project • Individual Practice Worksheets • Guided Practice Worksheets • Use Class Surveys to relate proportion concepts to the real-world • Apply the concept of Ordered Pairs & Quadrants to find the appropriate seat in the classroom (also used for the next week's seating chart) • Use real-world situations that represent examples of Parallel & Perpendicular slopes	• 4-Step Vocabulary Worksheet • Vocabulary List • Project Rubric • Mastery Math Material • Masking Tape • Pictures of Parallel & Perpendicular Lines

Career Connections

- Discuss how graphs model profit for companies, trends for stocks, tendencies for particular plays, formations, or strategies in sports, temperatures for weather t.v. anchors, trends in the real estate, effects of certain chemical herbicides on rice and various weed plants, etc.
- Discuss the relevance of rates in shopping/ groceries & percentages in studies, research, & even school or grades.