UNIT OF STUDY

Title: "Fun with Functions" (Unit 12)   **Subject/Course**: Integrated Algebra B Part 1   **Length:** 2½ weeks

Topic: Slopes and Functions **Grade:** 9   **Designer:** Foresee/Phipps

UNIT GOALS AND EXPECTATIONS

IMPORTANT CONCEPTS/UNDERSTANDINGS:
- Graphs can represent linear functions
- Points on the graph are solutions to the linear equation
- A function has only one output value for every input value
- The slope determines the steepness and direction of a line
- The y intercept determines where the line crosses the y axis
- The independent value determines the dependent value in an equation
- Linear Functions are a one to one mapping
- Functions help predict future outcomes
- Function of an independent variable is the same as a dependent variable
- The equation of line can be written in standard form, slope, and y intercept

ESSENTIAL QUESTIONS:
- What does the visual representation of a linear function look like?
- How do you graph a linear function?
- Do points satisfy linear equations?
- What is the Vertical Line Test?
- What is a function?
- What are the different forms of a linear function equation?
- How does slope, and y intercept help explain real world situations
- How do graphs help to explain real word situations
- How do you determine steepness of a line
- How do you determine the direction of a line?

STUDENT LEARNING EXPECTATIONS:
- LF.3.AI.1 Distinguish between *functions* and non-functions/*relations* by inspecting graphs, ordered pairs, *mapping diagrams* and/or *tables* of data
- 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.8 Write an equation in *slope-intercept, point-slope, and standard* forms given
  - two points
  - a point and y-intercept
  - *x-intercept* and y-intercept
  - a point and slope
  - a table of data
  - the graph of a line
- DIP.5.AI.7 Recognize *linear functions* and non-linear functions by using a table or a graph
- SEI.2.AI.6 Solve problems involving *direct variation* and indirect *(inverse) variation* to model rates of change

SPECIFIC DECLARATIVE KNOWLEDGE – What I know
Vocabulary:
- Correlation coefficient
- Intercepts
- Line of best fit
- Parallel lines
- Perpendicular lines
- Point-slope form
- Standard form
- Trend line
- X-intercept
- Y-intercept
- Linear equations/graph
- Linear tables
- Slope

SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do
- Write the equation of a linear equation given a graph, two points, or slope and one point
- Draw an axis and choose proper increments or intervals
- Find appropriate labels for both axis (x and y axis)
- Solve linear equations in relation to real world problems
- Determine the slope when given two points, a graph, or an equation
- Determine the x and y intercepts when given a graph or an equation
- Determine relation between two lines

• Special lines • Functions • Vertical line test • Direct Variation • Indirect Variation • Joint Variation • Coordinate Points • Rate of change	when given a graph, coordinates, or equations • Change an equation from one form to another

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 of functions • 1 Open Response prompt requiring students to interpret perpendicular and parallel lines • 1 Open Response prompt requiring students to write equations • 1 Open Response prompt requiring students to graph functions

Traditional Assessments:	Other Evidence of Learning:
• Multiple Choice Quizzes over: Function Values, Graphs of Equations, Equations of Linear Functions, and Variations • Unit Test over each topic mentioned above • Matching Test over Unit Vocabulary • Warm up Quizzes	• 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 • Individual Practice Worksheets • Guided Practice Worksheets • Use real-world situations that represent examples of Functions, Slopes, Parallel and Perpendicular lines, and direct, indirect and Joint Variations. • Group Competition involving racing problem at board using changing equation forms and writing equations from graphs, points, and Slopes. ("Slap Board") • Introduce Functions using Discovery Education Online • Linear Equations Group Activity and Graphing • Reinforce graphing Functions using Online Activity • Practice Open Response using Direct, Indirect, and Joint Variations	• 4-Step Vocabulary Worksheet • Vocabulary List • Project Rubric • Mastery Math Material • Pictures of Parallel & Perpendicular Lines • Discovery Education Website • http://stargazers.gsfc.nasa.gov/pdf/activities/math_activities/math_student/math_act_05_s.pdf • http://hotmath.com/hotmath_help/games/kp/kp_hotmath_sound.swf • Department of Education Released Items • http://cnx.org/content/m19225/latest/?collection=col10686

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