UNIT OF STUDY

Title:"Exponentially ^{Exponential}" (Unit 15) **Subject/Course:**Integrated Algebra B Part 1 **Length:**2½ weeks

Topic: Midpoint & Distance/ System of Inequalities/ Exponents **Grade:** 9   **Designer:** Foresee/Phipps

UNIT GOALS AND EXPECTATIONS	
IMPORTANT CONCEPTS/UNDERSTANDINGS: • Directions on a map also relate to a coordinate plane • Midpoint is an average and is represented as an ordered pair while Distance is a value represented in units • The rate (or slope) of an equation is found by finding the change in the rise over the change in the run between two coordinate points • The Vertical Translation is found by looking at the y-intercept of the equation in slope-intercept form • The y-value in an ordered pair is not necessarily the y-intercept in the equation of the line between the two coordinate points • Only the darkest shaded region of the graph of a system of inequalities is the solution to that system • The symbol of the inequality determines the type of line on its graph	**ESSENTIAL QUESTIONS:** • How do you tell if a function is linear? • How do you know if a graph is translated up or down? • How do you graph and/or solve a system of inequalities? • What are the laws of exponents? • What is the difference between negative and positive exponents? • How do you convert between scientific and standard notation and vice versa? • What is a^o, when $a \neq 0$? • How do you use the graph of a line to solve an inequality in the coordinate plane? • How do you use the graph of a system of linear equations to solve a system of inequalities?

STUDENT LEARNING EXPECTATIONS:
• SEI.2.AI.7 Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and Pythagorean *Theorem*)
• DIP.5.AI.7 Recognize *linear functions* and non-linear functions by using a table or a graph
• LF.3.AI.9 Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa
• LF.3.AI.8 Write an equation in *slope-intercept*, *point-slope*, and *standard* forms given
     o two points
     o a point and y-intercept
     o *x-intercept* and y-intercept
     o a point and slope
     o a table of data
     o the graph of a line
	• SEI.2.AI.1 Solve multi-step equations and inequalities with rational *coefficients*
	     o numerically (from a table or guess and check)
	     o algebraically (including the use of manipulatives)
	     o graphically
	     o technologically
	• LA.1.AI.3 Apply the laws of (integral) *exponents*

SPECIFIC DECLARATIVE KNOWLEDGE –	**SPECIFIC PROCEDURAL KNOWLEDGE –**

What I know	What I need to do
Vocabulary • x^n • $(x^n)^m$ • $(ab)^x$ • Scientific Notation • Simplify • Standard Notation • Systems of Linear Inequalities • x^0, $x \neq 0$ • x^{-n}, $x \neq 0$ • $x^n x^m$, $x \neq 0$ • Coordinates • East/West/North/South • Midpoint • Distance • Horizontal/Vertical • Linear Functions • Rate • Slope-Intercept Form • Standard Form • Exponents • Scientific & Standard Notation • Distributive Property • Vertical Change	• Know and use the laws of exponents to solve real world problems. • Convert between Scientific Notation and Standard Form • Be able to use midpoint formula to find distance between two points. • Determine linear functions by looking at their slopes. • Be able to tell if a given point is the solution to a given system of inequalities. • Be able to graph inequalities. • Compute zero and negative exponents. • Use distributive property and laws of exponents to solve real world problems • Multiplying or dividing by a power of 10.

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

- 3 Open Response prompt requiring students to use laws of exponents to solve real world problems.
- 1 Open Response prompts requiring students to compare and convert scientific notation and standard form.
- 1 Open Response prompt requiring students to solve equations in real world situations.
- "Money Bags" Project

Traditional Assessments:	Other Evidence of Learning:
• Multiple Choice Quizzes over: laws of exponents, distance formula, midpoint formula, writing equations, solving inequalities, scientific notation, vertical translations • Vocabulary Test • Warm-Up Quizzes • Unit Test	• "Homelearning" • Classwork • Warm-up exercises

ACTIVITIES AND LEARNING EXPERIENCES	Resources

• Introduce Vocabulary using 4-Step Vocabulary Strategy • Use Mastery Math materials to practice concepts • "Money Bags" Project (Scientific Notation) • Exponent Power Point Presentation(s)	• Vocabulary List • 4-Step Vocabulary Worksheet • Mastery Math materials • "Money Bags" Rubric • http://www.funmaths.com/worksheets/downloads/view.htm?ws0107_1.gif • http://math.pppst.com/exponents.html
Career Connections	
NASA, Scientist, Engineers, Physicians, Consultants	