Department: Mathematics
Course Name: Algebraic and Geometric Theory

Course Description:
Algebraic and Geometric Theory is a continuum of Pre-Algebra with an emphasis on US Algebra preparation. Concepts are introduced with emphasis on algebraic theory followed by practical application. All operations with real numbers and variables are fine-tuned. Solving equations is interwoven throughout the course to include equation-based problem solving. Throughout the course of the year, students will master concepts in Geometry, Measurement, Data Analysis, Number and Operations, and Algebra.

Content:
Principles of Algebra
Rational Numbers
Graphs and Relationships
Properties of Exponents and Roots
Foundations in Geometry
Perimeter, Area and Application
Data and Statistics
Probability
Multi-Step Equations and Inequalities
Linear Equations

Skills:
Evaluate algebraic expressions
Translate between algebraic and word phrases
Apply properties of numbers
Perform integer operations
Solve one-step equations using addition, subtraction, multiplication and division
Solve and graph inequalities
Write rational numbers in equivalent forms
Compare and order positive and negative rational numbers written as fractions, decimals and integers
Perform operations with rational numbers
Solve equations with rational numbers
Solve two-step equations
Write solutions of equations in two variables as ordered pairs
Graph points on the coordinate plane
Interpret information given in a graph and make a graph to model a situation
Represent functions with tables, graphs or equations
Generate different representations of the same data
Evaluate expressions with exponents
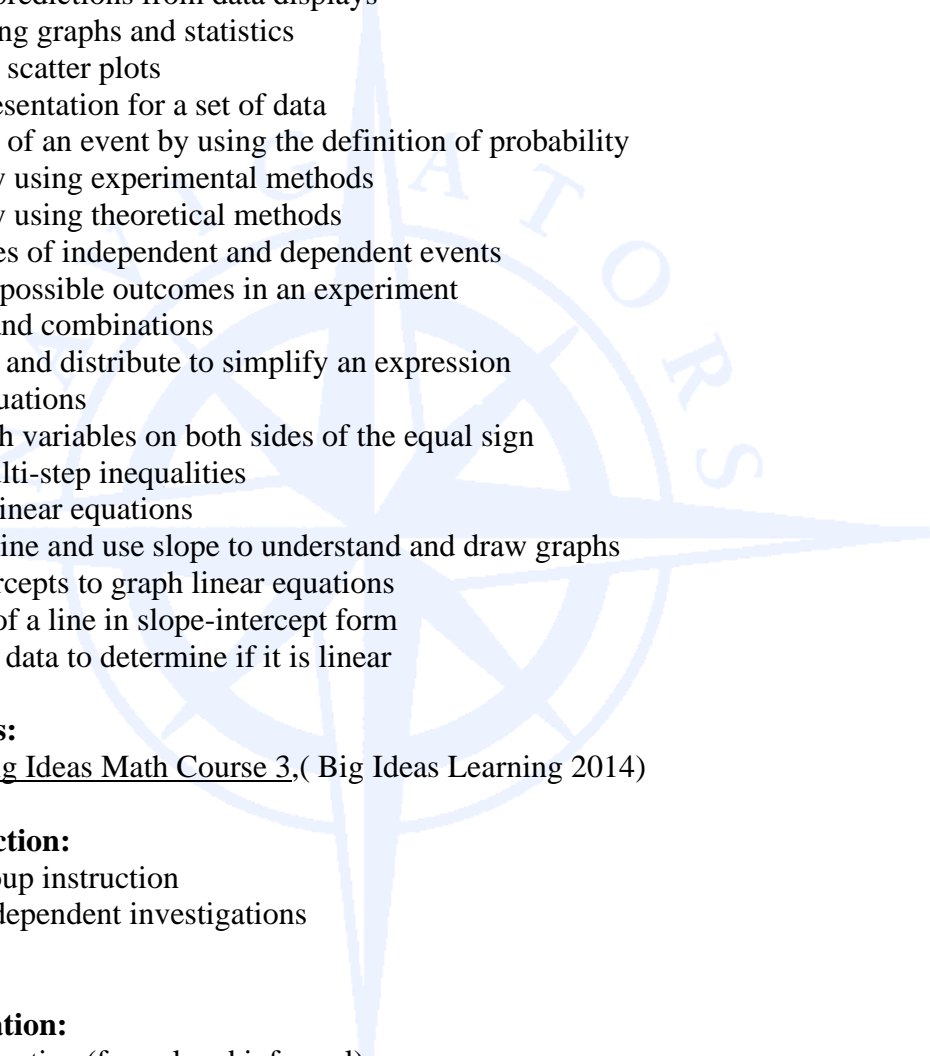Evaluate expressions with negative exponents and evaluate the zero exponent
Apply the properties of exponents
Express large and small numbers in scientific notation and compare two numbers written in scientific notation
Find square roots
Estimate square roots to a given number of decimal places and solve problems using square roots
Make comparisons between and find dimensions of scale drawings, models and actual objects

Become familiar with the concept of scale by making a scale drawing
Find the perimeter and area of rectangles and parallelograms
Find the perimeter and area of triangles and trapezoids
Find the surface area and volume of prisms, pyramids and cylinders
Verify the properties of transformations
Describe transformations using coordinates
Apply the Pythagorean Theorem
Organize data in line plots, stem-and-leaf plots
Find appropriate measures of central tendency
Display data in bar graphs, histograms and line graphs
Analyze and make predictions from data displays
Recognize misleading graphs and statistics
Create and interpret scatter plots
Select the best representation for a set of data
Find the probability of an event by using the definition of probability
Estimate probability using experimental methods
Estimate probability using theoretical methods
Find the probabilities of independent and dependent events
Find the number of possible outcomes in an experiment
Find permutations and combinations
Combine like terms and distribute to simplify an expression
Solve multi-step equations
Solve equations with variables on both sides of the equal sign
Solve and graph multi-step inequalities
Identify and graph linear equations
Find the slope of a line and use slope to understand and draw graphs
Use slopes and intercepts to graph linear equations
Write the equation of a line in slope-intercept form
Collect and analyze data to determine if it is linear

Text and Materials:
Boswell, Larson, Big Ideas Math Course 3,(Big Ideas Learning 2014)

Methods of Instruction:
Large and small group instruction
Small group and independent investigations
Online Activities

Methods of Evaluation:
Summative and formative (formal and informal)
Observation