

**Department:** Mathematics

**Course Name:** Algebraic Theory and Geometry

**Course Description:**

Algebraic Theory and Geometry is a continuum of Pre-Algebra with an emphasis in Algebra I preparation. Concepts are introduced with emphasis on algebraic theory followed by practical application. All operations with real numbers and variables are fine-tuned. Solving of 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