## Middle School Course Outline Subject: Mathematics

## Sixth Grade

## Introduction:

The sixth grade math program, Math in Focus (Singapore Math), helps students gain depth of understanding, fluency with skills, and confidence in problem solving.

## Content:

Positive and Negative Numbers, The Number Line:
Students will learn that a single number can be represented in many different ways. A number line will compare positive and negative numbers. Students will learn to identify prime and composite numbers. Students will then apply this knowledge to find the greatest common factor and least common multiple.

## Multiplying and Dividing Fraction and Decimals:

Students will learn how to divide fractions and multiply and divide decimals. Students apply multiplication and division skills to solve real-world problems involving fractions and decimals.

## Ratios and Rates:

Students will extend concepts learned with fractions to ratios and then to rates. Along with writing equivalent ratios and ratios in simplest form, they will solve ratio problems with two and three quatinities. Students will encounter three types of rates: unit rates, rates that vary over time, and average rates.

## Percent:

Students will learn to connect percent to concepts previously learned with fractions and decimals. Students learn to write equivalent fractions, decimals, and percents. Students will then work with the part, whole or percent relationship.

## Algebraic Expressions:

Students will learn how to write algebraic expressions to represent various situations. Students learn to use variables to represent unknown quantities. Students then learn how to evaluate algebraic expressions.

## Equations and Inequalities:

Students will use inverse operations to "get the variable alone" on one side of an equal sign to solve an equation. Students will learn to write inequalities. They use substitution
to evaluate simple equations and solve real-world problems by writing and solving both equations and inequalities.

## Coordinate Plane:

Students will identify and plot points on the coordinate plane and calculate the lengths of line segments, including sides of polygons.

## Area of polygons:

Students derive formulas for areas of triangles, parallelograms, trapezoids, and regular polygons. They will use the formulas to find areas, and given an area, identify unknown dimensions.

## Approach:

Through direct instruction, cooperative group work, independent work and games students develop various strategies and techniques to understand and solve math problems.

## Materials:

Math in Focus text, Chromebook, notebook and games.

## Evaluation:

Quizzes and chapter assessments are the basis for students' trimester grades.

## Middle School Course Outline

Seventh Grade

## Subject: Pre-Algebra

## Introduction:

The seventh grade math curriculum is based on the National Standards of the National Council of Teachers of Mathematics (NCTM). The stimulating curriculum promotes critical thinking and problem solving, and builds respect for the wide variety of successful strategies. Emphasis is placed on cooperative learning, as well as individual exploration, development, and mastery.

## Content:

## Numeration:

Students gain understanding of number properties and comparisons between Whole
Number sets. Students gain mastery of base ten numbers and utilizing Scientific Notation.

## Operations and Computation:

Students master multiplying and dividing fractions, mixed numbers, decimals, and positive and negative numbers. Students gain proficiency in using variables in equations and how inverse operations are utilized to solve.

## Statistics and Probability:

Students will study picturing numerical data, pictographs, circle graphs, mean, median, and range. In addition, students will explore permutations, combinations, and the probability of an event, the odds in favor and against, and mutually exclusive events.

## Geometry:

Students will become familiar with different geometric figures. Students learn the basics of geometric construction with a compass and straightedge.

## Measurements:

Students will explore two-dimensional figures for area calculations. Volume calculations for three-dimensional figures, surface area of three-dimensional solids, mass and density are explored in standard and Metric measurements.

## Patterns, Functions and Algebra:

Equations are solved using transformations, with emphasis on equations with decimals and fractions. Illustration with variables on both sides of the equation, as well as inequalities, is explored. Students are introduced to algebraic graphing on the number line and Cartesian plane.

## Materials:

Pre-Algebra (Holt McDougal), Larson/Boswell, and other math manipulatives and websites are used as needed.

## Evaluation:

Unit Assessments, teacher observations, daily journals work, student goal and self-assessment (portfolios), and alternative performance assessment are the basis for trimester grades.

## Middle School Course Outline Eighth Grade

## Subject: Algebra I

## Introduction:

The eighth grade math curriculum is based on the National Standards for the National Council of Teachers of Mathematics (NCTM). The stimulating curriculum promotes critical thinking and problem solving, and builds respect for the wide variety of successful strategies. Emphasis is placed on cooperative learning, as well as individual exploration, development, and mastery.

## Content:

## Numeration:

Students will learn to master the use of number properties to solve and prove algebraic transformations. Students will gain mastery in making comparisons among all types of Rational Numbers and be introduced to Irrational Numbers.

## Operations and Computation:

Students will master all operations over Rational Numbers, especially the use of inverse operations to solve linear and quadratic equations and inequalities.

## Statistics and Probability:

Students will explore concepts about sample space, events of random experiments and the probabilities of compound events. Representing the statistical data by means of a stem-and-leaf plot and box-and-whiskers plots will be included.
Geometry:
Students explore the use of lines and the Cartesian plane to graph solutions to linear equations and inequalities. Students are also introduced to the parabolic graph of a quadratic equations and inequalities. Also, trigonometric tables involving sine, cosine, and tangent are explored.

## Measurements:

Students will study direct variation from a graph or a table of values. They will identify the domain and range for a linear relation when given a set of ordered pairs.

## Patterns, Functions and Algebra:

Functions, equations, and inequalities of the first and second degree are presented. Solution sets of linear equations are represented graphically using the coordinate plane. Linear and quadratic functions are explored. Algebraic fractions and irrational numbers in equations are also introduced.

## Materials:

Algebra I (McDougal Littell), Larson/Boswell, and other math manipulatives and websites are used as needed.

## Evaluation:

Unit assessments, teacher observations, daily journals work, student goal and self-assessment (portfolios), and alternative performance assessment are the basis for their trimester grades.

## Middle School Course Outline <br> Eighth Grade

## Subject: Geometry

## Introduction:

The eighth graders who are placed in Geometry have completed a full year of Algebra I. The Geometry curriculum is based on the National Standards for the National Council of Teachers of Mathematics (NCTM) and reinforces concepts and computational skills learned in the previous grades. The stimulating curriculum promotes critical thinking and problem solving, and builds respect for the wide variety of successful strategies. Emphasis is placed on cooperative learning, as well as individual exploration, development, and mastery.

## Content:

The Geometry course explores a full year of High School Geometry through more intensive cooperative learning and individual initiative and exploration. The emphasis is on production assessment, the student creation and cultivation of self interest projects that require depth of mathematical investigation.

## Materials:

Geometry (Holt McDougal), Larson/Boswell, various web sites, and other math manipulatives are used as needed.

## Evaluation:

Unit Assessments, teacher observations, daily journals work, student goal and self-assessment (portfolios), and alternative performance assessment.

