Math SYLLABUS (1st ~ 8th Grade, Advance, SAT/ACT)

Math -- 1st Grade

Prerequisite for this class
1. Kindergarteners or 1st graders in regular school
2. At least 5 years old

Duration of the class – 1 hour/week

Syllabus
1. Numeration (0 through 99)
2. Addition (2 digits; no renaming)
3. Subtraction (2 digits; no renaming)

Math -- 2nd Grade

Prerequisite for this class
1. Completed 1st grade math in Chinese School
2. 1st or 2nd graders in regular school

Duration of the class – 1 hour/week

Syllabus
1. Introduce simple number theory.
2. Addition (2 digits; with renaming)
3. Subtraction (2 digits; with renaming)
4. Multiplication (1 digit multiply by 1 digit and 2 digits multiply by 1 digit)
5. Division (1 digit divide by 1 digit and 2 digits divide by 1 digit)

Math – 3rd Grade

Prerequisite for this class
1. Completed 2nd grade math in Chinese School
2. 2nd or 3rd graders in regular school

Duration of the class – 1 hour/week

Syllabus
1. Introduce simple number theory.
2. Multiplication of multiple-digit numbers
3. Division of multiple-digit numbers
4. Mixed operations
5. Apply the basic number theory and operations of natural numbers to solve word problems
6. Introduce the concept of fractions and operations of fraction.
7. Introduce some basic concepts of plane Geometry such as Length, Area, and Volume.

Math – 4th Grade

Prerequisite for this class
1. Completed 3rd grade math in Chinese School
2. Honor 4th graders in math in regular school

Duration of the class – 1 hour/week

***Textbook**:
PRE-ALGEBRA, Publisher: Holt, Rinehart and Winston, Inc., 1992 Authors:
Eugene D. Nichols, Bonnie H. Litwiller, and Paul A. Kennedy ISBN : 0030470684

Syllabus (from Chapter1 to Chapter8)

***Integers**
1. Comparing and Ordering Integers
2. Adding Integers
3. Subtracting Integers
4. Multiplying Integers
5. Dividing Integers

***Variables and Expressions**
1. Evaluating Expressions
2. Order of operations
3. Basic Properties and Mental Computation

4. Using the Distributive Property
5. Formulas: Perimeter, Area, and Average
6. Area Formulas: Parallelograms, Triangles, and trapezoids

***Equations and Problem Solving**
1. Equations and Inequalities
2. Solving Equations
3. Solving Addition and Subtraction Equations
4. Solving Multiplication and Division Equations
5. Inverse Operations
6. Solving Multi-Step Equations
7. Translating Word Expressions
8. Problem Solving: Writing an Equation

***Rational Numbers**
1. Factors and Multiples
2. Tests for Divisibility
3. Prime Numbers
4. Prime factorization
5. Exponents
6. LCM and GCF

***Fractions**
1. Equivalent Fractions
2. Multiplying Fractions
3. Multiplying Mixed Numbers
4. Using Reciprocals to Solve Equations
5. Dividing Fractions and Mixed Numbers
6. Fractions with Like Denominators
7. Fractions with Unlike Denominators
8. Subtracting Mixed Numbers

***Probability**
1. Ratio and Proportion
2. Ratio and Measurement
3. Probability
4. Independent and Dependent Events
5. Making Choices
6. Permutations

***Decimals**
1. Rational Expressions
2. Rational Numbers
3. Decimals and Fractions
4. Repeating Decimals
5. Estimating Sums and Differences
6. Scientific Notation
7. Estimating Products and Quotients of Decimals

***Percent**
1. The Meaning of Percent
2. Decimals and Percents
3. Estimating the percent of a Number
4. Finding the Percent of a Number
5. Interest
6. Discount
7. Solving Percent Equations and Proportions
8. Percent Increase and Decrease

Math – 5th Grade

Prerequisite for this class
1. Completed 4th grade math in Chinese School
2. Honor 5th graders in math in regular school

Duration of the class – 1 hour/week
***Textbook:**
PRE-ALGEBRA, Publisher: Holt, Rinehart and Winston, Inc., 1992 Authors:
Eugene D. Nichols, Bonnie H. Litwiller, and Paul A. Kennedy ISBN : 0030470684

Syllabus (from Chapter9 to Chapter16)

***Analyzing Data**
1. Misleading Graphs
2. Using Data from Graphs and tables
3. Measures of Central Tendency
4. Stem and Leaf Plots
5. Box and Whisker Plots

***The Number Line**
1. The Set of Real Numbers
2. The addition Property of Inequality
3. The Multiplication Property of Inequality
4. Solving Inequalities
5. Conjunctions
6. Disjunction

***The Coordinate Plane**
1. Coordinate Graphs
2. Graphing Linear Equations
3. The Standard Form of a linear Equation
4. The Slope of a Line
5. Graphing Equations and Inequalities
6. Translations

***Square Roots and Right Triangles**
1. Square Roots
2. Using Square Roots
3. The Pythagorean Theorem
4. Similar triangles
5. The tangent Ratio

***Polynomials**
1. Adding Polynomials
2. Subtracting Polynomials
3. Multiplying Binomials
4. Using the Distributive property
5. Special Products
6. Common factors
7. Factoring a trinomial

***Equations in Geometry**
1. Angles and Angle Measures
2. Parallel and Perpendicular Lines
3. Triangles
4. Polygons
5. Circumference and Area
6. Circle Graphs

***Volume and Surface Area**
1. Surface Area and Volume
2. Volume of a Rectangular Prism
3. Surface Area of a rectangular Prism
4. Volume of a Cylinder
5. Volume of a Pyramid
6. Volume of a Cone
7. Volume and Area of a Sphere

Math – 6th Grade

Prerequisite for this class

1. Completed 5th grade math in Chinese School
2. Honor 6th graders in math in regular school

Duration of the class – 1 hour/week

***Textbook:**

ALGEBRA 1, Publisher: Holt, Rinehart and Winston, Inc., 1992 Authors:
Eugene D. Nichols, Mervine L. Edwards, etc. ISBN :0030054192

Syllabus (from Chapter1 to Chapter8)

***Introduction to Algebra**

1. Algebraic Expressions.
2. Grouping Symbols.
3. Exponents
4. Formulas from Geometry
5. The commutative and Associative Properties.
6. The distributive Property.
7. Combining Like Terms.

***Operations with Real Numbers**

1. The Set of Real Numbers.
2. Opposites and Absolute Value.
3. Addition on a Number Line.
4. Adding Real Numbers.
5. Subtraction of Real Numbers.
6. Multiplication of Real Numbers.
7. Division of Real Numbers.
8. Mixed Operations.
9. Like Terms.
10. Removing Parentheses.

***Solving Equations**

1. Solving Equations by Adding or Subtracting or by Multiplying or Dividing.
2. Using two properties of Equality.
3. Equations with variable on both sides.
4. Equation with Parentheses.
5. Problem Solving.

***Applying Equations**

1. Translating English to Algebra.
2. Problem solving: Two or more Numbers, Consecutive Integer Problems, Perimeter and Angle Measure.
3. Equations with Fractions, with Decimals.
4. Percent Problems.

***Inequalities and Absolute Value**

1. The Addition, Subtraction, Multiplication and Division Properties of Inequalities.
2. Conjunction and Disjunction.
3. Combining Inequalities.
4. Problem Solving.
5. Equations and Inequalities with Absolute Value.

***Powers and Polynomials**

1. Multiplying Monomials.
2. Powers of Monomials.
3. Dividing Monomials.
4. Negative Exponents.
5. Scientific Notation.
6. Simplifying Polynomials.
7. Addition, subtraction and Multiplication of Polynomials.

***Factoring Polynomials**

1. Introduction of Factoring.

2. Greatest Common Monomial Factor.
3. Factoring Trinomials.
4. Combined Types of Factoring.
5. Solving Quadratic Equations by Factoring.
6. Problem solving.

***Rational Expressions**
1. Simplifying Rational Expressions.
2. Multiplying and Dividing Rational Expressions.
3. Adding and Subtracting Rational Expressions.
4. Dividing Polynomials.
5. Complex Rational Expressions.

Math – 7th Grade

Prerequisite for this class
1. Completed 6th grade math in Chinese School
2. Honor 7th graders in math in regular school

Duration of the class – 1 hour/week

***Textbook:**
ALGEBRA 1, Publisher: Holt, Rinehart and Winston, Inc., 1992 Authors: Eugene D. Nichols, Mervine L. Edwards, etc. ISBN :0030054192

Syllabus (from Chapter9 to Chapter16)

***Applying Rational Expressions**
1. Rational Equations
2. Ratios and Proportions
3. Literal Equations
4. Problem Solving: Motion Problems
5. Problem Solving: Work Problems
6. Dimensional Analysis

***Relations, Functions, and Variations**
1. Coordinates of Points in a Plane
2. Relations and Functions
3. Values of a Function
4. Equations with Two Variables
5. Graphing Linear Equations
6. Direct Variation
7. Inverse Variation

***Analytic Geometry**
1. Slope of a Line
2. Equation of a Line: Point-Slope Form
3. Equation of a Line: Slope-Intercept Form
4. Line Relationships
5. Graphing Linear Inequalities

***Systems of Linear Equations**
1. Systems of Equations-Graphing
2. The Substitution Method
3. Problem Solving: Using two Variables
4. The Addition Method
5. The Multiplication with Addition Method
6. Problem Solving: Digit problems
7. Problem Solving: Age Problems
8. Problem Solving: Coin and Mixture problems
9. Problem Solving: Motion Problems
10. Systems of Inequalities

***Radicals**
1. Rational Numbers and Irrational numbers
2. Square Roots

3. Approximating Square Roots
4. The Pythagorean Theorem
5. Simplifying Radicals
6. Adding and Subtracting Radicals
7. Multiplying Radicals
8. Dividing radicals
9. Radical Equations

***Quadratic Equations and Functions**
1. The Square Root Property
2. Completing the Square
3. The Quadratic Formula
4. Choosing a Method of Solution
5. Problem Solving: Quadratic Equations and Geometry
6. Quadratic Functions
7. Quadratic Functions and the Discriminate

***Trigonometry**
1. Similar Triangles
2. Trigonometric Ratios
3. Trigonometric Tables
4. Right-Triangle Solutions
5. Problem Solving: Applying Trigonometry

***Probability and Statistics**
1. Probability of an Event
2. Probability: Compound Events
3. Mean, Median, and Mode
4. Statistical Graphs
5. Range and Standard Deviation

Math – 8th Grade

Prerequisite for this class
1. Completed 7th grade math in Chinese School
2. Honor 8th graders in math in regular school

Duration of the class – 1 hour/week

***Textbook:**
ALGEBRA 2, Publisher: Holt, Rinehart and Winston, Inc., 2004 Authors:
James E. Schultz, Wade Ellis, Jr., Kathleen A. Hollowell, Paul A. Kennedy. ISBN :0030700442

Syllabus (from Chapter1 to Chapter7)

***Data and Linear Representations**
1. Tables and Graphs of Linear Equations
2. Slopes and Intercepts
3. Linear Equations in Two Variables
4. Direct Variation and Proportion
5. Scatter Plots and Least-Squares Lines
6. Introduction to Solving Equations
7. Introduction to Solving Inequalities
8. Solving Absolute-Value Equations and Inequalities

***Numbers and Functions**
1. Operations with Numbers
2. Properties of Exponents
3. Introduction to Functions
4. Operations with Functions
5. Inverses of Functions
6. Special Functions
7. A Preview of Transformation

***Systems of Linear Equations & Inequalities**
1. Solving Systems by Graphing or Substitution

2. Solving Systems by Elimination
3. Linear Inequalities in Two Variables
4. Systems of Linear Inequalities
5. Linear Programming
6. Parametric Equations

***Matrices**
1. Using Matrices to Represent Data
2. Matrix Multiplication
3. The Inverse of a Matrix
4. Solving Systems with Matrix Equations
5. Using Matrix Row Operations

***Quadratic Functions**
1. Introduction to Quadratic Functions
2. Introduction to Solving Quadratic Equations
3. Factoring Quadratic Expressions
4. Completing the Square
5. The Quadratic Formula
6. Quadratic Equations and Complex Numbers
7. Curve Fitting with Quadratic Models
8. Solving Quadratic Inequalities

***Exponential and Logarithmic Functions**
1. Exponential Growth and Decay
2. Exponential Functions
3. Logarithmic Functions
4. Properties of Logarithmic Functions
5. Applications of Common Logarithms
6. The Natural Base, *e*
7. Solving Equations and Modeling

***Polynomial Functions**
1. An Introduction to Polynomials
2. Polynomial Functions and Their Graphs
3. Products and Factors of Polynomials
4. Solving Polynomial Functions
5. Zeros of Polynomial Functions

Advance Math – Algebra II & Intro to Geometry
Prerequisite for this class
1. Completed 8th grade math in Chinese School
2. Honor 8th graders or higher in math in regular school

Duration of the class – 1.5 hour/week
***Textbook:**
ALGEBRA 2, Publisher: Holt, Rinehart and Winston, Inc., 2004 Authors:
James E. Schultz, Wade Ellis, Jr., Kathleen A. Hollowell, Paul A. Kennedy. ISBN: 0030700442
GEOMETRY, Publisher: McDougal Littell and Company, 1991 Copyright, 1997 impression,
Authors: Richard Rhoad, George Milauskas, Robert Whipple. ISBN: 0-86609-965-4

Syllabus (ALGEBRA 2: from Chapter8 to Chapter14)

***Rational Functions & Radical Functions**
1. Inverse, Joint, and Combined Variation
2. Rational Functions and Their Graphs
3. Multiplying and Dividing Rational Expressions
4. Adding and Subtracting Rational Expressions
5. Solving Rational Equations and Inequalities
6. Radical Expressions and Radical Functions
7. Simplifying Radical Expressions
8. Solving Radical Equations and Inequalities

***Conic Sections**

1. Introduction to Conic Sections
2. Parabolas
3. Circles
4. Ellipses
5. Hyperbolas
6. Solving Nonlinear Systems

***Discrete Mathematics: Counting Principles and Probability**
1. Introduction to Probability
2. Permutations
3. Combinations
4. Using Addition with Probability
5. Independent Events
6. Dependent Events and Conditional Probability
7. Experimental Probability and Simulation

***Discrete Mathematics: Series and Patterns**
1. Sequences and Series
2. Arithmetic Sequences
3. Arithmetic Series
4. Geometric Sequences
5. Geometric Series and Mathematical Induction
6. Infinite Geometric Series
7. Pascal's Triangle
8. The Binomial Theorem

***Discrete Mathematics: Statistics**
1. Measures of Central Tendency
2. Stem-and-Leaf Plots, Histograms, and Circle Graphs
3. Box-and-Whisker Plots
4. Measures of Dispersion
5. Binomial Distributions
6. Normal Distributions

***Trigonometric Functions**
1. Right-Triangle Trigonometry
2. Angles of Rotation
3. Trigonometric Functions of Any Angle
4. Radian Measure and Arc Length
5. Graphing Trigonometric Functions
6. Inverse of Trigonometric Functions

***Further Topics in Trigonometry**
1. The Law of Sines
2. The Law of Cosines
3. Fundamental Trigonometric Identities
4. Sum and Difference Identities
5. Double-Angle and Half-Angle Identities
6. Solving Trigonometric Equations

Syllabus (GEOMETRY: from Chapter1 to Chapter6 or more depend on students' level)

***Exploring Geometry**
1. Basic terms
2. Length and angles measurement
3. Co-linearity, parallel and perpendicular
4. Compliment and supplement angles, vertical angles

***Reasoning in Geometry**
1. Paragraph prove and 2-column prove
2. Definitions, postulates, theorems
3. Deductive structure, logic statement, reverse, inverse, contra-positive and alternate prove

4. Addition, subtraction, multiplication and division properties
5. Transitive and substitute properties

***Triangle Congruence**
1. Three basic ways to prove triangle congruence
2. CPCTC
3. Types of triangles, angle-side theorems, HL postulate

***lines in a plane**
1. Equal-distance theorem
2. Indirect prove
3. Parallel lines

*** Parallels and Polygons**
1. Introduction to polygons
2. Properties of quadrilaterals
3. Parallelogram and other special quadrilaterals: definitions and prove
4. More theorems for triangles
5. Polygons and regular polygons

***lines and planes in space**
1. Three-dimensional figures
2. Lines perpendicular to a plane: definition and prove
3. Basics of parallel planes

*** Similar triangles and misc.**
1. Similar triangles
2. Pythagorean Theorem
3. Areas and volumes
4. Basic of Coordinate Geometry

Math – SAT / ACT

. **Prerequisite for this class**
1. Completed 8th grade math in Chinese School
2. 8th or higher graders in regular school

. **Duration of the class** – 2 hour/week