CAAP Enriched Mathematic

We use math everyday even if we are not aware of it. Students learn mathematics by constructing meaning through ever-increasing levels of abstraction, starting with exploring their own personal experiences, understandings and knowledge. This course is not just aimed at students who are struggling with keeping with the mathematics taught in classes at school but also for students who want to get a richer, deeper grasp of mathematical concepts and be able to apply these concepts into many different applications in life. In addition this course will prepare students to reach an international competition level of mathematics, drawing materials from the Singapore, Shanghai and UK international mathematics competition.

Outcome:

- Students can individual makes sense of problem and persevere to solve them;
- Use abstract and quantitative reasoning to solve problems;
- Use patterns and relationships to analyze the problem situations;
- Develop problem solving skills in use to math to solve real life problems;
- Able to use the appropriate tools and strategies and notation to solve problems.
- Able to reach level high enough to enter an international mathematics competition with confidence

** Base upon the Chinese / Singapore School Mathematic levels for CAAP Math*

Course Content

The content and objectives of the course are in line with the objectives set by Singaporean National Mathematic system, drawing addition problems form the Mainland Chinese Mathematical System. The course will begins with revising over the basic concepts of mathematics, focus on training counting skills, calculation skills and measurement skills. As students get older there will be a strong emphasis on problems solving various strategies to solve problems. Other more complex form of calculations such as algebra, fractions, geometry, statistics, probability and decimals will gradually be introduced through the program. The aim of this course is not only to train students to be exceptional at their school mathematics but rather to train proficient mathematicians who are sharp at making accurate calculations and able to apply mathematics to a number of daily problems.

Class Structure

Each class will go for duration of 2 hours. Pre-K to grade 8 classes will be divided into 2 one hour sessions spread over two days. Grades 9-12 will have one two hour class per week. During the classes students will be taught math concepts a year above their level. In addition they will learn new techniques and theories which they do not learn in their regular math classes at school. The material used in the class will be drawn from textbooks used in Singapore and from the Mainland Chinese public school textbooks. Students will be given a number of addition problems to solve and math drills to enhance their calculation speed, logic and problem solving skills, so that they could enter an international math problem with confidence.

Course Framework

Age Group	Main Contents
K	Numbers and Numbers to 10; Number Bonds; Addition Within 10; Subtraction Within 10; Shapes and Patterns; Ordinal Numbers and Position; Numbers to 20; Addition and Subtraction Within 20; Length; Numbers to 40; Picture Graphs; Multiplication; Division; Time; Numbers to 100
G1	Patterns and Number Sequence Understanding Addition Understanding Subtraction Data and Graphs Addition Strategies Subtraction Strategies Time Numbers to 100 Measurement Addition and Subtraction Strategies to 100 Money Geometry Place Value Two-digit Addition and Subtraction
G2	Number Sense and Patterns Addition Strategies Subtraction Strategies Data and Groups Two-Digit Addition Two-Digit Subtraction Money Multiplication and Division Concepts Fractions Numbers to 100 Geometry Measurement and Time Three-Digit Addition Three-Digit Subtraction

G3	Place Value and Number Sense Addition Subtraction Multiplication Concepts and Facts More Multiplication Facts Division Concepts and Facts More Division Facts Measurement: Customary System Measurement: Metric System Measurement and Geometry Statistics: Data, Graphs, and Probability Fractions Fractions by One-Digit Numbers Multiply by One-Digit Numbers Divide by One-Digit Numbers
G4	Place Value and Number Sense Addition and Subtraction Algebra: Use Addition and Subtraction Statistics: Data and Graphs Multiplication and Division Facts Algebra: Use Multiplication and Division Multiply by One-Digit Numbers Multiply by Two-Digit Numbers Divide by One-Digit Numbers Geometry Geometry and Measurement Algebra and Graphing Fractions Decimals Decimals: Addition and Subtraction Probability
G5	Number Sense, Algebra, and Functions Statistics and Data Analysis Adding and Subtracting Decimals Fractions and Decimals Adding and Subtracting Fractions Multiplying and Dividing Decimals and Fractions Algebra: Integers and Equations Percent and Probability Geometry: Angles and Polygons Measurement: Perimeter, Area, and Volume
G6	Algebra and Functions Numbers Sense: Fractions Algebra and Number Sense: Proportions and Percentage Statistics, Data Analysis, and Probability Geometry and Measurement

G7	Working Mathematically; Percentage; Ratios, Rates and Scale Drawing; Using Calculators and Spreadsheets; Patterns and Algebra; Equations, Formulae and Inequalities
G8	The Number Plane; Graphs and Tables; Reasoning in Geometry; Area and Volume; Circles; Geometry Constructions and Congruent Figures; Statistics; Probability; Graph Theory
G9-10	**Algebra:** Expressions, Equations, and Inequalities; Functions, Equations and Graphs; Linear Systems; Quadratic Functions and Equations; Polynomial and Polynomial Functions; Radical Functions and Rational Exponents; Exponential and Logarithmic Functions; Rational Functions; Sequence and Series; Quadratic Relations and Conic Sections; Probabilities and Statistics; Matrices **Geometry:** Essential of Geometry; Reasoning and proof; Parallel and perpendicular lines; Congruent Triangles; Relationship within Triangles; Similarity; Right Triangles and Trigonometry; Quadrilaterals; Properties of transformations; Properties of Circles; Measuring length and Area; Surface area and volume of solids
G11-12	**Heart of Algebra:** Analyzing and fluently solving linear; equations and systems of linear; Creating linear equations and inequalities to represent relationship between quantities and to solve problems; Understanding and using relationship between linear equations and inequalities and their graphs to solve problems;

	Problem Solving and Data Analysis: Creating and analyzing relationship using ratios, proportional relationships, percentage, and units; Representing and analyzing quantitative data; Finding and applying probabilities in context; Passport to Advanced Math: Identifying and creating equivalent algebraic expressions; Creating, analyzing, and fluently solving quadratic and other nonlinear equations; Creating using, and graphing exponential, quadratic, and other nonlinear functions; **Additional to Math:** Solving problems related to area and volume; Applying definitions and theorems related to lines, angles, triangles, and circles; Working with right triangles, the unit circle, and trigonometric functions