Grade 1-8

Semi-Private Class and Open Lecture

Course Syllabus

August 2020

2020-2021 Course Syllabus

Part 1 Semi-Private Class Syllabus

Semi-private (SP) tutorials provide students a systematic enhancement of curriculum math. The course manual includes both standard-level exercises and advanced-level exercises for each topic. The class size for each SP tutorial is between 1 to 4 students.

The course manual will be distributed by email one week before the tutorial. Students need to work on the problem sheet (or pre-read the exercise if you find them challenging) before each class. The course-manual material comes from various resources, including IXL, Jump Math, Singapore math, IB curriculum, Waterloo CEMC courseware, sample contests, etc.

Part 1 shows the syllabus of semi-private tutorials for Grade 1-8. Remark: topics are subject to adjustment to meet students' level.

3 rules for the semi-private online class:

- o   Rule 1: Accept the class invitation if you plan to participate.
- o   Rule 2: Pre-read and prepare the course manual carefully before the class.
- o   Rule 3: Do the homework! Send me your questions online
  https://sallybanana.com/banana-math

Grade 1-2 Semi-Private Course Syllabus (March 2020-August 2020)

Section 1	Counting and Number Patterns, Additions (Grade 1-2 level)
Section 2	Subtractions, Mixed Operations (Grade 1-2 level)
Section 3	Comparing and Ordering (Grade 1-2 level)
Section 4	Fractions (Grade 1-2 level)
Section 5	Place Values, Estimation and Rounding (Grade 1-2 level)
Section 6	Two- and Three- dimensional shapes (Grade 1-2 level)
Section 7	Money and Time (Grade 1-2 level)
Section 8	Data and Graph, Logic Reasoning (Grade 1-2 level)
Section 9	Units of measurement (Grade 1-2 level)
Section 10	Geopolitical Measurement (Grade 1-2 level)
Section 11	Probability and Statistics (Grade 1-2 level)
Section 12	Understanding multiplication (Grade 1-2 level)

Milestone review (Grade 1-2)
By the end of the class, students should be able to have the following skill set.
Curriculum Level:
- 9 x 9 Multiplication Table
- Number Patterns and Counting (even or odd, skip-counting, counting pattern up to 1000)
- Comparing and Ordering (Comparing numbers up to 1000, greatest and least)

- Patterns (growing, repeating)
- Addition Subtraction up to three digits
- Place Values (up to thousands)
- Estimation and Rounding (nearest ten, hundred or thousands)
- Logic Reasoning, Money, Time
- Data and graph (tally charts, coordinate plane, Venn diagram)
- Unit of measurement (compare size, weight and capacity, thermometer, convert metric units of volume/mass)
- Two or three-dimensional shapes
- Geometric measurement (perimeter, area)
- Fractions
- Introduction of probability and statistics
- Mixed operation (up to 100)

Enhancement Level (IB curriculum or one level up)
- Roman numbers
- Multi-step inequality
- Multiplication (Long method, box method, lattice method)
- Division up to 12
- Equations and variables

Contest Level (Optional)
- Kangaroo contest (Grade 1-2)
- Caribou (Grade 1-2)
- Singapore math (Level 1-2)

Grade 2-3 Semi-Private Course Syllabus (September 2020-February 2021)

Section 1	Number Theory (Grade 2-3 level)
Section 2	Multiplication (Grade 2-3 level)
Section 3	Division (Grade 2-3 level)
Section 4	Additions and Subtractions (Grade 2-3 level)
Section 5	Mixed Operations and Properties (Grade 2-3 level)
Section 6	Fractions (Grade 2-3 level)
Section 7	Geometry (Grade 2-3 level)
Section 8	Money and Time (Grade 2-3 level)
Section 9	Decimals (Grade 2-3 level)
Section 10	Units of Measurement (Grade 2-3 level)
Section 11	Time and Money (Grade 2-3 level)
Section 12	Data, Probability and Statistics (Grade 2-3 level)

Milestone review (Grade 2-3)
By the end of the class, students should be able to have the following skill set.
Curriculum Level:
- 9 x 9 Multiplication Table
- Number sense (Order, compare numbers up to 5 digits, Roman numerals, prime and composite numbers)

- Mixed operation (add, subtract multiply and divide natural numbers)
- Multiplication (Long method, box method, lattice method)
- Division up to 10
- Estimation and Rounding (nearest ten, hundred or thousands)
- Logic Reasoning, Money, Time
- Data and graph (tally charts, coordinate plane, Venn diagram)
- Unit of measurement (compare size, weight and capacity, thermometer, convert metric units of volume/mass)
- Two or three-dimensional shapes
- Geometric measurement (perimeter, area)
- Fractions
- Introduction of probability and statistics
- Mixed operation (up to 100)

Enhancement Level (IB curriculum or one level up)
- Roman numbers
- Multi-step inequality
- Multiplication (Long method, box method, lattice method)
- Division up to 12
- Equations and variables

Contest Level (Optional)
- Kangaroo contest (Grade 2-3)
- Caribou (Grade 2-3)
- Singapore math (Level 2-3)

Grade 3-4 Semi-Private Course Syllabus (March 2020-August 2020)

Section 1	Number Theory, Logical reasoning (Grade 3-4 level)
Section 2	Addition and Subtraction (Grade 3-4 level)
Section 3	Multiplication and Division (Grade 3-4 level)
Section 4	Fraction (Grade 3-4 level)
Section 5	Money and Measurement (Grade 3-4 level)
Section 6	Decimal Numbers (Grade 3-4 level)
Section 7	Time and Temperature (Grade 3-4 level)
Section 8	Perimeter and Area, Coordinate plane (Grade 3-4 level)
Section 9	Two- and Three-Dimensional Shapes (Grade 3-4 level)
Section 10	Locations and Movements, Patterns and Sequences (Grade 3-4 level)
Section 11	Data Management and Probability (Grade 3-4 level)
Section 12	EQAO assessment, review and enhancement (Grade 3-4 level)

Milestone review (Grade 3-4)
By the end of the class, students should be able to have the following skill set.

Curriculum Level:

- Number sense (Order, compare numbers up to 5 digits, Roman numerals, prime and composite numbers)
- Mixed operation (add, subtract multiply and divide natural numbers)
- Multiplication (Long method, box method, lattice method)
- Division up to 12
- Variables expression and function
- Pattern and sequence (geometric pattern)
- Time, Money, Unit of measurement
- Geometry (level 3-4)
- Fraction and decimals
- Probability and statistics (mean, mode, median, combination)

Enhancement Level (IB curriculum or one level up)

- Operation with fraction and decimals
- Number theory
- Solving equation with whole numbers
- Data and graph (stem-and-leaf plots)

Contest Level (Optional)

- Kangaroo contest (Grade 3-4)
- Caribou (Grade 3-4)
- Singapore math (Level 3-4)
- Thales (Grade 3)
- Byron-Germain (Grade 3)
- Math League (MLA Level 4)
- MLA Algebra Course (Level 4-5)

Grade 4-5 Semi-Private Course Syllabus (September 2020-February 2021)

Section 1	Number Theory, Addition and Subtraction (Grade 4-5 level)
Section 2	Multiplication and Division (Grade 4-5 level)
Section 3	Mixed Operation (Grade 4-5 level)
Section 4	Fractions (Grade 4-5 level)
Section 5	Money, Time, Temperature (Grade 4-5 level)
Section 6	Decimal Numbers (Grade 4-5 level)
Section 7	Geometry (Grade 4-5 level)
Section 8	Location and Movements (Grade 4-5 level)
Section 9	Geometry (Grade 4-5 level)
Section 10	Patterns and Sequences (Grade 4-5 level)
Section 11	Variable Expression (Grade 4-5 level)
Section 12	Data Management and Probability (Grade 4-5 level)

Milestone review (Grade 4-5)

By the end of the class, students should be able to have the following skill set.

Curriculum Level:

- Whole number, decimals, integers, rational numbers
- Mixed operation (add, subtract multiply and divide whole numbers/decimals)
- Number theory (GCF, LCM)

- Fractions and mixed numbers (add, subtract and multiply fractions)
- Mixed operation with fractions
- Basic finance knowledge
- Unit of measurement, time, money, consumer math
- Coordinate planes
- Expression and properties, one-variable equations, two variable equations
- Two-dimensional figures (circle, polygons, etc.)
- Symmetry and transformation
- Geometry (level 4-5)
- Statistics and probability (mean, median, mode, range, combination and compound events)

Enhancement Level (IB curriculum or one level up)

- Expression and properties, one-variable equations, two variable equations
- Probability of opposite, mutually exclusive and overlapping events, experimental probability

Contest Level (Optional)

- Kangaroo contest (Grade 4-5)
- Caribou (Grade 4-5)
- Singapore math (Level 4-5)
- Fibonacci (Grade 5)
- Math League (MLA Level 4)

Grade 5-6 Semi-Private Course Syllabus (March 2020-August 2020)

Section 1	Number Theory, Addition and Subtraction (Grade 5-6 level)
Section 2	Multiplication and Division (Grade 5-6 level)
Section 3	Decimals (Grade 5-6 level)
Section 4	Fractions and Percent (Grade 5-6 level)
Section 5	Money, Time, Temperature (Grade 5-6 level)
Section 6	Measurement (Grade 5-6 level)
Section 7	Geometry (Grade 5-6 level)
Section 8	Location and Movements (Grade 5-6 level)
Section 9	Proportional Relationship (Grade 5-6 level)
Section 10	Patterning (Grade 5-6 level)

Milestone review (Grade 5-6)

By the end of the class, students should be able to have the following skill set.

Curriculum Level:

- Whole number, decimals, integers, rational numbers
- Mixed operation (add, subtract multiply and divide whole numbers/decimals)
- Exponents
- Number theory (GCF, LCM)
- Fractions and mixed numbers (add, subtract and multiply fractions)
- Mixed operation with fractions

- Ratio, rate and percent
- Unit of measurement, time, money, consumer math
- Coordinate planes
- Expression and properties, one-variable equations, two variable equations
- Two-dimensional figures (circle, polygons, etc.)
- Symmetry and transformation
- Geometry (level 5-6)
- Statistics and probability (mean, median, mode, range, combination and compound events)

Enhancement Level (IB curriculum or one level up)
- Proportions
- Exponents and square roots
- Constructions (angle bisector, midpoint, perpendicular bisector of segment)
- Probability of opposite, mutually exclusive and overlapping events, experimental probability

Contest Level (Optional)
- Kangaroo contest (Grade 5-6)
- Caribou (Grade 5-6)
- Singapore math (Level 5-6)
- Fibonacci (Grade 5)
- Pythagoras (Grade 6)
- Math League (MLA Level 5-6)
- Gauss (Grade7)

Grade 6-7 Semi-Private Course Syllabus (September 2020-February 2021)

Section 1	Data Management and Probability (Grade 6-7 level)
Section 2	Number Theory (Grade 6-7 level)
Section 3	Integers (Grade 6-7 level)
Section 4	Fractions and Percent (Grade 6-7 level)
Section 5	Money, Time, Temperature (Grade 6-7 level)
Section 6	Measurement (Grade 6-7 level)
Section 7	Geometry (Grade 6-7 level)
Section 8	Location and Movements (Grade 6-7 level)
Section 9	Proportional Relationship (Grade 6-7 level)
Section 10	Exponent (Grade 6-7 level)
Section 11	Algebra (Grade 6-7 level)
Section 12	Finance (Grade 6-7 level)

Milestone review (Grade 6-7)

By the end of the class, students should be able to have the following skill set.

Curriculum Level:
- Exponents and square roots
- Understand two-variable equations
- Linear function
- Scientific notion
- Ratios, rates and proportions
- Pythagorean theorem
- Unit of measurement, time, money, consumer math
- Coordinate planes
- Expression and properties, one-variable equations, two variable equations
- Two-dimensional figures (circle, polygons, etc.)
- Symmetry and transformation
- Geometry (level 6-7)
- Statistics and probability (mean, median, mode, range, combination and compound events)

Enhancement Level (IB curriculum or one level up)
- Proportions
- Exponents and square roots
- Constructions (angle bisector, midpoint, perpendicular bisector of segment)
- Probability of opposite, mutually exclusive and overlapping events, experimental probability

Contest Level (Optional)
- Kangaroo contest (Grade 6-7)
- Caribou (Grade >6)
- Singapore math (Level >6)
- Pythagoras (Grade 6)
- Math League (MLA Level 6-7)
- Gauss (Grade7)

Grade 7-8 Semi-Private Course Syllabus (March 2020-August 2020)

Section 1	Representing and Comparing Numbers (Grade 7-8 level)
Section 2	Operations (Grade 7-8 level)
Section 3	Ratios, Rates and Proportions (Grade 7-8 level)
Section 4	Bisectors and Properties of Shapes (Grade 7-8 level)
Section 5	Area, Volume and Angles (Grade 7-8 level)
Section 6	Transformations of Shapes (Grade 7-8 level)
Section 7	Representing Patterns (Grade 7-8 level)
Section 8	Equations and the Pythagorean Theorem (Grade 7-8 level)

Grade 8-9 Semi-Private Course Syllabus (September 2020-February 2021)

Section 1	Data Collection and Graphs (Grade 8-9 level)
Section 2	Data Analysis (Grade 8-9 level)
Section 3	Probability (Grade 8-9 level)
Section 4	Manipulating Algebraic Expressions (Grade 8-9 level)
Section 5	Linear Equations
Section 6	Analytic Geometry
Section 7	Measurement and Geometry
Section 8	Finance

Milestone review (Grade 7-9)
By the end of the class, students should be able to have the following skill set.
Curriculum Level:
- Operations with rational numbers
- Arithmetic and geometric number sequences
- Solve linear equations
- Exponents and square roots
- Understand two-variable equations
- Linear function
- Scientific notion
- Ratios, rates and proportions
- Pythagorean theorem
- Algebra (Grade 8)
- Geometry (Grade 8)

Enhancement Level (IB curriculum or one level up)
- Polynomials
- Circles

Contest Level (Optional)
- Gauss
- Kangaroo
- Euler/Lagrange
- AMC 8
- MLA level 7-8
- Caribou

Part 2 Open Lecture Course Syllabus

Open Lectures (OL) provide students short-term, seasonal and topic-based online tutorials. Course manual of open lectures covers both curriculum level and contest level exercises but is more focusing on a particular math topic. For instance, a review of probability, a recap of algebra, etc.

The course manual will be distributed by email one week before the tutorial. Students need to work on the problem sheet (or pre-read the exercise if you find them challenging) before each class. The course-manual material comes from various resources, including IXL, Jump Math, Singapore math, IB curriculum, Waterloo CEMC courseware, sample contests, etc.

Following gives a list of topics that will be distributed in the upcoming open lectures. Remark: topics are subject to adjustment to meet students' needs.

3 rules for the Open Lecture online class:

- o   Rule 1: Accept the class invitation if you plan to participate.
- o   Rule 2: Pre-read and prepare the course manual carefully before the class.
- o   Rule 3: Do the homework! Send me your questions online
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Grade 4-5 (September 2020-February 2021)

Fibonacci/Pythagoras Contest	3-5 Lectures	September-October 2020
MLA Contest	3-5 Lectures	November-December 2020

Grade 6-7 (September 2020 – February 2021)

Euler/Lagrange	6 Lectures	September-October 2020
MLA Grade 6-7	6 Lectures	November-December 2020
Gauss (L7)	6 Lectures	January-February 2020

Grade 3-4 (February 2020-August 2020)

Kangaroo Review	3-5 Lectures	February-March 2020
Review of Grade 3-4 Algebra	3-5 Lectures	March-April 2020
Review of Grade 3-4 Geometry	3-5 Lectures	April-May 2020
Thales/Bryon-Germain Contest	1-3 Lectures	May-June 2020
MLA Algebra	3-5 Lectures	June-July 2020
Finance	3-5 Lecture	July-August 2020

Grade 5-6 (February 2020 – August 2020)

Kangaroo Review	3-5 Lectures	February-March 2020
Review of Grade 5-6 Algebra	3-5 Lectures	March-April 2020
Review of Grade 5-6 Geometry	3-5 Lectures	April-June 2020
Probability and Statistics	3-5 Lectures	July-August 2020
Fibonacci/Pythagoras Contest	3-5 Lectures	June-July 2020
MLA Grade 5-6	3-5 Lectures	July-August 2020