NWCS Summer SAT Math

**Time:** 1:00pm – 3:30pm

**Number of Session:** 6 (July 1, 3, 5, 8, 10, 12)

NWCS SAT math provide a best test preparation coverage on the SAT topics, as well as in-depth test drill. The course goal is to help each student make a significant improvement within a short period of time. We aim at achieving the goal through intensive in-class exercise and group discussion. The examples we used in this course are carefully selected: 1) They are very classical and represent the SAT math style well. 2) Teacher will teach students what is the key in solving the example questions, and test-taking techniques will be mentioned when analyzing the questions. 3) Teacher will also mark the difficulty of each example question, which helps students at different math ability levels.

The summer SAT math course intends to work with students on the following four topics.

Topic 1. Core and Fundamental Algebra - Analyzing linear equations and systems of linear equations to solve word problems - Building linear equations and inequalities to solve relational problems - Using relationship between linear equations and inequalities and their graphs to solve word problems

Topic 2. Advanced Algebra - Creating algebraic expressions - Solving quadratic and other nonlinear equations - Graphing exponential, quadratic and other nonlinear equations

Topic 3. Data Analysis - Using ratios, percentages, and units to analyze relationships - Representing and analyzing quantitative data

- Applying probabilities based on context

Topic 4. Geometry basics - Solving problems involving area and volume - Applying definitions and theorems of lines, angles, triangles and circles - Working with right triangle, the unit circle and simple trigonometric functions

**Organization of class sessions:**

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*Each quiz usually lasts about 30 minutes*
This course is designed to help students begin to learn Algebra. Targeted students are elementary to middle school students. It is a great opportunity for students to refresh and sharpen their knowledge/skill in the pre-algebra area, and get familiar with an algebraic thinking in problem-solving. This course targets students who have finished NWCS's Enrichment 4 class, or its equivalent level. Students who complete this camp will be able to explore the Algebra world further, and take on new challenges.

The class size will be limited to 12 students with the intention of creating more opportunities for class room discussion and teacher-student interaction.

The purpose of the class has three aspects:

1) help students transition smoothly from arithmetic to algebraic mindset;
2) challenge students with real-world problems that require algebraic thinking;
3) enhance students' problem solving skill by a series of intensive exercises.

Class Organization

The 2.5 hours class will be typically ordered in the following way.

* Quiz and warmup (10 minutes)
* Homework analysis (20 minutes)
* New lecture (75 minutes)
* In-class practice and group discussion (45 minutes)

(break time included)

Textbook:

https://www.singaporemath.com/New_Elem_Math_Textbk_1_p/nemt1.htm
This 6 x 2.5 hrs/day camp will cover the following topics

(subject to change in order to tailor the material for the actual class of students)

Session 1: Diagnosis and review number theory

Session 2: Fundamental concepts and operations - arithmetic problem solving and real numbers

Session 3: From Arithmetic to Algebraic thinking (1) - Algebraic expressions

Session 4: From Arithmetic to Algebraic thinking (2) - Open sentences and equations

Session 5: From Arithmetic to Algebraic thinking (3) - Rate, ratio, and percentage

Session 6: Review, final test and analysis
NWCS Summer Advanced Algebra for Middle School

**Time:** 7:00pm-9:00pm Every Wednesday & 10:00am-12:00pm Every Saturday.

**Number of Session:** 8 (June 26th – July 20th)

Advanced Algebra for Middle School is designed to help students to review and deepen the understanding of middle school Algebra. It targets the students who finished the Enrichment 4-Algebra class and/or who have the basic knowledge of Algebra. The class size will be limited to 12 students with the intention of creating more opportunity for class room discussion and teacher-student interaction.

The purpose of the class is three folded:
1) provide a thorough review of the most important Algebra concepts learned in the past one year;  
2) challenge the student with more advanced algebraic problem;  
3) enhance the problem solving skill by intensive in-class exercise and group discussion.

**Organization**
The 2 hours class will be typically ordered in the following way.
- Quiz (5-10 minutes)
- Discuss the homework and quiz (15- 20 minutes)
- New lecture (50- 60 minutes)
- Classroom exercise and group discussion (30-40 minutes)

**Textbook:**
The class teaching material is based on the "New Elementary Mathematics 2" by Singapore Math - [http://www.singaporemath.com/New_Elem_Math_Textbk_2_p/nemt2.htm](http://www.singaporemath.com/New_Elem_Math_Textbk_2_p/nemt2.htm).
This is the same book used for the Enrichment Math 4- Algebra. Additional study material will be provided by the teacher.

**Sessions**
This 4-week course will cover the following topics:

Session 1: One-variable linear equation and its application to solve real problem

Session 2: Algebraic operation, Algebra manipulation - expanding and factorization

Session 3: Exponents and Indices

Session 4: One-variable quadratic equation and its application to solve real problem
Session 5: Rate, Ratio, Percentage and their application in financial transaction

Session 6: System of equations and its application

Session 7. The X-Y coordinate plan; Linear and quadratic equation in graph

Session 8: Solving inequity
Advanced Geometry for Middle School is designed to help students to review and deepen the understanding of middle school Geometry. It targets the students who already have the basic knowledge of Geometry. The class size will be limited to 12 students with the intention of creating more opportunity for class room discussion and teacher-student interaction.

The purpose of the class is three folded:
1) provide a thorough review of the most important Geometry concepts
2) challenge the student with more advanced problem;
3) enhance the problem solving skill by intensive in-class exercise and group discussion.

**Organization**
The 2 hours class will be typically ordered in the following way.
- Quiz (20 minutes)
- Discuss the homework and quiz (20 minutes)
- New lecture (80 minutes)

**Textbook:**
The class teaching material is partially based on the "New Elementary Mathematics 2" by Singapore Math -
Additional study material will be provided by the teacher.

**Session**
This 4-week course will cover the following topics:

Session 1: Basic of geomentry

Session 2: Reasoning and proof

Session 3: Basics of triangle

Session 4: Congruent and similar triangles

Session 5: Right Triangle and trignomentry
Session 6: Circles

Session 7: Polygons

Session 8: Solid figures
**NWCS Summer Advanced Algebra 2 for Middle School**

**Time:** 7:00pm-9:00pm Every Wednesday & 2:00pm-4:00pm Every Saturday.

**Number of Sessions:** 8 (August 21st – September 14th)

Algebra II builds on the skills and concepts you learned in Algebra I. One of the key concepts is the idea of functions: functions are fundamental building blocks for the development of higher mathematics. It targets the students who finished Enrichment 4-Algebra. It is more advanced and it prepares students for high school.

This class is:
1) designed to help students review, improve, and build stronger math foundations;
2) challenge the student with more advanced problem beyond Algebra I;
3) enhance the problem solving skill by intensive in-class exercise and group discussion.

**Organization**
The 2-hour class will be typically ordered in the following way.
- Quiz (5-10 minutes)
- Discuss the homework and quiz (15-20 minutes)
- New lecture (50-60 minutes)
- Classroom exercise and group discussion (30-40 minutes)

**Textbook:**
The class teaching material is based on the "Algebra II" by McGraw Hill.
A screenshot of the cover page of the textbook is attached.

**Sessions**
This 4-week course will cover the following topics:

Session 1: Linear equation and inequalities

Session 2: Quadratic relationships

Session 3: Complex numbers

Session 4: Polynomial functions

Session 5: Relational and irrational functions
Session 6: Exponential and logarithmic functions

Session 7. Sequences and series

Session 8: Introduction to probability
NWCS Summer Math Olympic (AMC 8) Training Class

Time: 9:00 am to 12:00 pm (Weekday only)

Number of Sessions: 10 (July 15\textsuperscript{th} – July 26\textsuperscript{th})

Purpose

We intend to provide a training opportunity to students who want to get ready for a national math competition, i.e. AMC 8. ([http://amc.maa.org/e-exams/e4-amc08/amc8.shtml](http://amc.maa.org/e-exams/e4-amc08/amc8.shtml)).

The program takes 10 days. Training material will be within the scope of AMC 8.

- Short-term Goal: Help students to improve their performance (scoring) in AMC 8.

- Long-term Goal: Help students who have great passion to learn fundamental math concepts, and are eager to expose themselves to challenging problem-solving world at the level of elementary to middle school.

Students:

Students who have previously taken MO1 (Math competition for beginners from NWCS) or equivalent knowledge. The most important thing is student’s curiosity and passion to learn.

Course Plan

Day 1 – Number Sense and Number Theory

Day 2 – Fraction, Ratio and Proportion

Day 3 – Basic Geometry

Day 4 – Basic Algebra

Day 5 – Interim Review and Practice

Day 6 – Counting and Number Series

Day 7 – Probability and others
Day 8 – Comprehensive

Day 9 – Potpourri

Day 10 – AMC 8 test simulation & award

Every day we follow basic teaching principle:

- Give students preview of what they expect to learn for the day, in order to warm up the class;

- Teach students step by step using the simplest language, and have the students practice when they learn;

- Emphasize again what teacher has taught for the day, and give students more challenges as needed.

Detailed sequence:

1st hour - Introduce basic concepts, explain in-depth of techniques in specific areas;

2nd hour - Provide students hands on opportunity, teacher gives guidance and helps students diagnose their mistakes to improve learning results;

3rd hour - Reiterate fundamental concepts from different perspectives, summarize what have been taught;
NWCS Summer Math Olympic (AMC 10/12)

**Time:** 6:30 pm to 9:00 pm

**Number of Sessions:** 6 (July 23, 24, 25, 30, 31 & August 1)

**Purpose**

Over past years, we have seen many advanced students struggling with hard problem-solving on AMC 10/12 (http://www.maa.org/math-competitions/amc-1012). We want to help these students by providing them with a systematic training program, to increase their chance to achieve excellent performance that they well deserve in AMC 10/12 tests.

**Students:**

No restriction on student’s current grade level, but the student should be very comfortable with AMC 8 level of test already.

**Course Plan**

The training program will take 6 sessions to introduce problem-solving techniques from basic to intermediate level across four major math competition topic areas.

1. **Geometry** - useful properties and key patterns of triangle, polygon, circle, cube, and other important objects, apply coordinate system and complex number concepts to solve complicated geometry problems.

2. **Algebra** - powerful manipulations, various equations and functions, polynomial theorems.

3. **Number Theory** – fundamental theorems, and their applications.

4. **Combinatorial** - advanced counting patterns, probability scenarios.
NWCS Summer Computer Programming (Java Intensive)

Time:  6:30 pm to 9:00 pm

Number of Sessions:  6 (July 9, 10, 11, 16, 17, 18)

Course Description

The course is designed to guide students to review the programming basic and practice coding for small functions. The 6-session course with 2.5 hours each session intends to help students ramp up basic knowledge of Java programming quickly, master common coding tricks, inspire students to think “programmatically” when they solve interesting problems. The course is designed as “Java Intensive”, so students will get enough opportunities to get hands-on experiences with programming in Java and effectively become familiar with Java language by using Eclipse to create small applications.

After taking the 15-hour course, students will learn how to setup Java development environment and get ready to create basic level of Java application. Students will also learn math counting and its application to computer programming. The level in this course is close to intermediate.

Course Requirements

Every student needs to bring a laptop with Java development tool (i.e. Eclipse) installed. Students who want to take this course are passionate about computer technology.

To make sure students receive good quality of study results, students will be interviewed before their registrations can be accepted.
**Summer English Writing & Reading For Grade 4th - 5th**

**Time:** 9:00 am–11:00 am

**Number of Sessions:** 10 (July 8th – July 19th)

This Summer Camp Workshop is designed to enrich children’s understanding and application of higher level grammar and develop their overall English communication skills. As a summer camp, the learning is done through the art of engaging and experiencing activities that they can relate to; studies have proven that children’s learning and memory are enhanced when they are experiencing fun and hands-on relevant applications while learning.

**Learning Objectives:**

- Develop English reading, writing, and speaking skills.
- Build higher educated vocabulary (5th grade level standard)
- Practical applications of beginning-to-intermediate grammar functions.
- Create and practice conventional sentence fluency and paragraphing.
- Write the standard academic essay format, including a summary, an outline, and a final essay.

**Experiential Activities Overview:**

- Practice reading popular children’s stories in class.
- Review 5th grade level vocabulary study guides and participate in oral vocabulary quizzes.
- Daily writing journal entries (creative writing and personal narratives)
- Irregular Verb Ball Toss
- Practice Prepositions with Puppet Play.
- An adjective and adverb treasure hunt
- Jenga Asking Questions & Giving Replies Game
- Crazy Action Verbs Relay Game
- Word Scavenger Hunt (5th Grade Vocabulary)
- Pictionary, using the vocabulary they have been learning in this workshop
- Team class presentations of their written projects (project-based learning)

The instructor, Kurt Lehman, M.Ed.-TESOL, has his Master’s in Education and is a Certified ESL Teacher. He has been teaching English for over ten years in the U.S. and abroad, including universities in China. Mr. Lehman is currently teaches English 4-5, Reading & Writing at NWCS and is a Program Director of an after-school program for K-5 graders.

He has designed this English Summer Camp to be student-centered, which encourages and supports the children in their early learning development of the Washington State’s core curriculum state Standard English requirements. By fostering pro-active fun and high productivity in the classroom, it provides an optimal learning environment for the children. The parents are encouraged to audit the class anytime.