



**Math  
program**



## Daily Math Class

Students have a daily math class for one hour, with Monday-Thursday being curriculum math and Fridays being math circles.

Our math levels would correspond to grades in other schools, however, at Helios we prefer to talk about Level 5 math instead of fifth grade math. This helps students understand that they are learning math that is “the right level for them” no matter what grade they are in.

Students in a regular leveled math class should fully master at least that level of math curriculum, and be ready for placement in the next math level in the fall. Students are re-evaluated for placement every year before stable math groups begin.



# Placement

Students are placed into the math level that best fits their knowledge level. We want students to be appropriately challenged in their math class.

We evaluate and place students into their appropriate math levels at the beginning of the year based on their demonstrated readiness, MAP testing, classroom observations, and teacher evaluations.

For AoPS levels, in addition to the students' mathematical knowledge, we evaluate the students' readiness by focusing on their ability to problem-solve, show their thinking, and their reading and writing readiness.

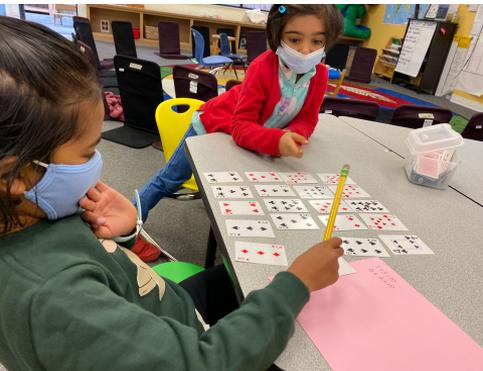
Within a math group, teachers adapt daily activities to the observed learning needs of their students, which may include teaching content from another level. Math group placement generally does not change during the school year.



## K-6 Math Curriculum

At the kindergarten through 6th-grade level, we use the Singapore Math curriculum. This curriculum is particularly suited for gifted learners as it's paced and sequenced for increased depth and complexity:

- It covers fewer topics per grade level, but at a greater depth, and emphasizes mastery of each concept before moving on.
- It focuses on conceptual understanding before memorization of procedures and algorithms
- It emphasizes developing good problem solving and thinking skills by increasing problem-solving challenges
- It actively promotes multiple representations (pictures, words, numbers, manipulatives) and connections between them as part of making meaning and communication in mathematics.



# Singapore math FAQ

What is covered in each level of Singapore Math?

- See [this document](#) for the K-6 math content

What is spiraling and how is it different from repeating content every year?

- Every year the same general topic might be repeated, but with a different conceptual emphasis. See [this document](#) for an example.

How is Singapore Math related to Common Core?

- Singapore Math incorporates Common Core standards at or before the assigned level. It also includes some learning goals not included in Common Core. [This document](#) describes where each concept is taught in Levels 1-5.

## What's Next

After completing the Singapore K-6 math program, our curriculum switches to the Art of Problem Solving for PreAlgebra, Algebra, Geometry and beyond. To be successful in an AoPS class, students need:

- Strong problem-solving skills
- Understanding that math is about more than just procedures and algorithms
- Ability to explain - show their mathematical thinking verbally and in writing
- Good reading and listening comprehension
- Readiness for 30-40 minutes of math homework per night

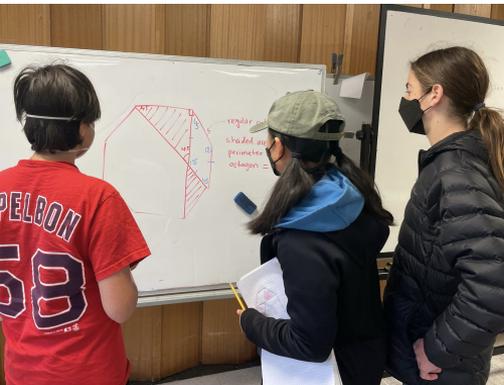
# Art of Problem Solving Math

After the students complete the Singapore math sequence, they move onto the Art of Problem Solving curriculum, which consists of

- PreAlgebra
- Introduction to Algebra
- Algebra and Applications
- Geometry

In contrast to traditional math curricula, AoPS students are exposed to concepts by working through problems, with the method/algorithm presented after the student has grappled with the problem.

Students focus on deep conceptual understanding instead of memorization of procedures and algorithms, learn problem-solving strategies instead of single-use tricks, and learn to think deeply about mathematics, to show their thinking, and to check their work.



# Homework Policies

At the AoPS levels, students are expected to complete 30-40 minutes of nightly math homework. This allows them to apply the concepts learned in class, investigate new concepts before coming to class for discussion, and increase their fluency.

## What's Next

Some advanced students complete the AoPS Algebra and Geometry sequence while still at Helios. For those students, we have available advanced math classes such as:

- Advanced Algebra
- Analysis

Advanced students may also study topics not found in the typical math sequence, such as:

- Counting and Probability
- Number Theory
- Another math topic a student might want to pursue on their own

EVERY DAY  
IS A GOOD  
DAY TO  
LEARN.



## AoPS Math FAQ

Can my child take an AoPS class outside of school and will you count it?

- If your child takes an AoPS class outside of school (either online or through AoPS Academy), we will need an official transcript showing the student has successfully completed the class.

I heard that Art of Problem Solving is a curriculum that is aimed at mathematically advanced students. My child is just regular in math, are you sure this is the right curriculum for them?

- Emphatically yes! While originally written as a curriculum for students intending to participate in math contests and the like, AoPS has been successfully used for classroom math, both at Helios and at other schools. The focus on deep conceptual understanding and problem solving benefits all students!



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## Overview of Math Circles

Math Circles are complex, open-ended math challenges that students solve as a group.

Students work together to define mathematical questions, notice patterns, and test solutions, often discovering multiple approaches to the same problem. Students are doing the real-world work of mathematicians; beyond writing and solving symbolic math problems, they generalize, prove, and investigate unusual mathematical questions.

While many schools in the Bay Area offer a version of a Math Circle as an enrichment activity, Helios includes it in the regular curriculum.



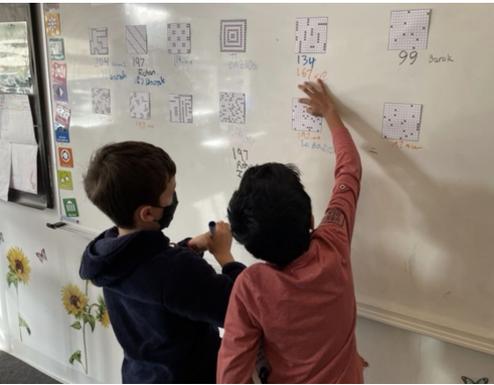
# Weekly Math Circle

All students, from kindergarten to advanced math have a math circle on Fridays.

At all levels, students are encouraged to investigate a math problem and then ask their own mathematical questions and “what ifs” related to the problem they solved.

In upper levels, math circle topics often span several weeks, with student groups doing a deep investigation of a problem and presenting their solutions to the class.

We view math circles as an integral part of our math curriculum, not as an enrichment or after-school activity.



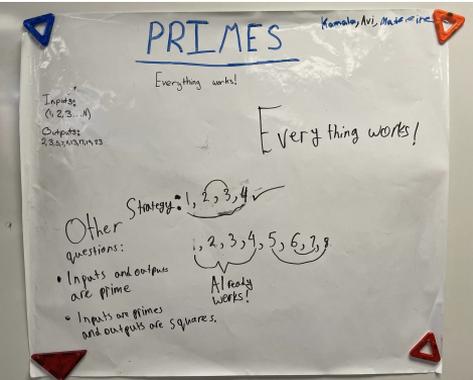
## Extra-curricular Math

In addition to our classroom math program, Helios offers some extra-curricular math opportunities in the form of math competitions. Middle school students interested in preparing for competitions can join the Math Team Exploration.

The following math competitions may be administered at Helios throughout the year:

- AMC 8
- Math Kangaroo
- Bay Area Math Olympiad (BAMO)
- MOEMS at the elementary and middle school level

Depending on student interest and availability, Helios sometimes also fields a MATHCOUNTS team.



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