A message from the Executive Director, Tom Young

Hello all!

Newsletter #5 for the 2022 – 2023 season. In it, notice these items:

1. State Tournament Results
2. Summer Math Camp Dates, Teachers, and Topics
3. Summer Coaches Conference
4. **Request for volunteers to serve on a committee to examine our practices and suggest changes.**
5. **Legislation to create scholarships for Math League students! See page below!!!!!**

Allow me to highlight an item:

4. **Request for volunteers to serve on a committee to examine our practices and suggest changes.**

The continued success of the league is something I reflect on often. While most schools have a vibrant math team, there are some schools that struggle to fill a full team of eight. This 2022- 2023 season, there were 28 teams with fewer than eight students. As a coach, I remember how sometimes it was difficult to get new students involved. Perhaps it is time for a facelift in the league to make it more appealing to freshman and sophomores. **I am looking for volunteers to serve on a committee to examine our practices and weigh changes that will make the League more vibrant and appealing to students.**

The committee will meet from 8am to 4pm Thursday July 20th at Augsburg. Room TBD.

To help the committee, we will be sending a survey to all coaches to suggest ideas. One idea that I will pursue for next year is the creation of a Math League "Escape Room in a Box." My vision is that each team would receive a box (briefcase?) with an escape room theme to use as the coach sees fit. A recruiting tool, perhaps?

Send ideas by responding to the survey! Remember we want to create a culture of coolness!
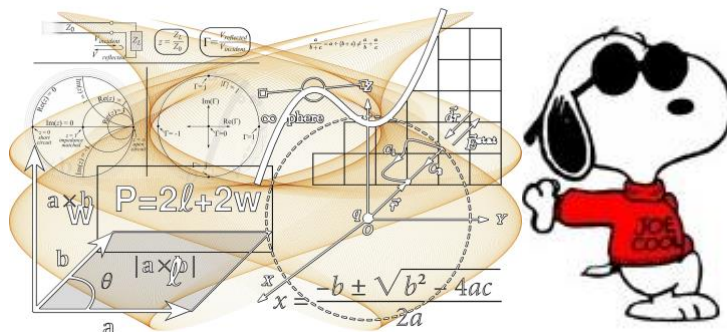
State Meet Team Results

Class A
Marshall School	St Louis River	57
Schaeffer Academy	Hiawatha	57
St. Agnes School	Tri-Metro	56

Class AA
International School MN	Canterbury	76
Orono HS	Metro Alliance	68
Mankato West HS	MN Valley	64

Class AAA
Wayzata HS	Southwest Suburban	114
Edina HS	Southwest Suburban	98
Century HS	Big 9	94

Overall Individual Champion: Henry Zheng

Math Bowl Champion: Sneha Kundu

First female winner!!

ALL STATE TEAM

As the academic year comes to a close, we reflect on the successes of the MN All State Math Team. This year, we participated in several prestigious competitions across the United States, including CMIMC at Carnegie Mellon University, PUMAC at Princeton University, and the Stanford Math Tournament.

This spring, we sent three teams composed of 18 students from 12 high schools to Carnegie Mellon University for CMIMC. The students enjoyed mini-events hosted by MN All State Math Team Alum Andy Nedimeir as well as getting to meet Po Shen Loh on his "home turf." Special congratulations to Austin Wang '26 Mounds View and Kaining Zhang '26 Blake for finishing in the top 10% in Geometry and Combinatorics respectively.

The following weekend, we sent two teams to Princeton University for PUMAC. At PUMAC, our students competed against teams from all over the world, including Korea, India, and New Jersey. Our competitors got to tour campus with head problem writer Frank Lu (All State Alum '20 Minnetonka) who showed us all the buildings he knew on campus—the math building, the physics building, and his dorm.   Minnesota Gold triumphed over our regional rivals from Chicago who we will meet again in a few short months at ARML. Special congratulations to Matthew Chen who finished 2nd overall in Geometry and was a finalist at this contest.

Finally, on Easter Sunday, four teams from the MN All State team competed virtually in the Stanford Math Tournament. Rounds of this contest are still ongoing, so results have yet to be announced, but the students enjoyed this unique contest—particularly the calculus round which most contests omit. Thanks to continued support from Augsburg University for hosting our team.

Looking ahead, we have one more major contest for the year, as well as the selection of the 2023-2024 team in May and June. Please share our application with your students and send them to us if they have any questions.

We are incredibly proud of all your students' accomplishments this season and are excited for what the future holds for the MN All State Math Team.

Minnesota All-State Math Team

Coaches Matt Eggert & Zach Sheffert

Legislation to create scholarships for Math League students!!

Four State Senators (Hoffman, Abeler, Kupec, and Gustafson) have introduced legislation to offer scholarships to Math League students.

The bill asks for sixty $5000 scholarships to be awarded in each of the next four years to students with 3 years of experience in the League and who attend a Minnesota college.

Senate File 2217 (SF2217) has currently been referred to the Higher Education committee.

Here was our rationale:

The Minnesota State High School Mathematics League is a nonprofit dedicated to challenging Minnesota students to deepen their problem-solving skills through extracurricular mathematics. The League looks to create sixty $5000 scholarships for a total of $300,000 each year for the next 4 years.

We feel a scholarship program would benefit students, high schools, Minnesota colleges, and the state of Minnesota in general.

The benefits for the students would be:
- 1. Access to financial support for their college education, reducing their financial burden.
- 2. Increased motivation to excel in mathematics, which could have a positive impact on their future careers.

The benefits for the Minnesota state high school mathematics league would be:

- 3. Increased reputation and recognition as a supportive organization of math education in the state.
- 4. Potential increase in participation in the league's programs, as students may be more incentivized to excel in mathematics.

The benefits for the colleges in the state of Minnesota would be:

- 5. Increased interest from high-achieving math students thereby attracting a stronger pool of applicants.
- 6. Potential increase in collaboration and partnerships with the league, leading to more resources and opportunities for students.

The benefits for Minnesota in general would be:

- 7. Increased support for education, which could have a positive impact on the state's future workforce.
- 8. Increase in the number of high-achieving math students staying in the state for college, contributing to the state's economy.

Allocating the scholarships

We would allocate the scholarships as follows: Each class of teams (A, AA, AAA) would be ranked by their team scores. The top twenty teams in each class would each receive a scholarship to be awarded to a senior attending a Minnesota college. If the school did not have an eligible senior, the scholarship would then fall to the next school in ranking.

Needs to be done

1. Letters (or emails) of support need to be written to your state legislator!!

Here is a sample letter:

I support legislation to create a scholarship fund for Minnesota State High School Mathematics League participants. I ask for your vote on Senate bill SF2217 and/or House bill _____-

My name is _____ _____ and I live at _____. You are my state senator/representative for District _____

The scholarship fund will help the league and the state in many ways. It helps the league recruit and retain participants. The financial burden for students would be eased.   It reinvests in the state college and university system, awarding money only to those students who attend a state university. Students would be more likely, I feel, to stay in the great state of Minnesota.

Please help us support excellence in mathematics in Minnesota!

With regards,

Signature _____

2. Progress of the bill can be found at:

[Progress of Math Team Scholarship Bill](#)

Summer Coaches Conference 2023
Topic: Giving Math League a Facelift
Dates: July 27 - 28

With the challenge of making Math Team more appealing to students, the topic of the conference will be how to give Math Team a facelift. Conversation items include: topic list, number of topics per meet, how a meet is run, getting more schools and students involved

Make plans to attend!!

Thursday night social is dinner and a ball game at the St. Paul Saints stadium!

2023 Summer Math Institute

June 25 – June 30 Residential Camp for 10th – 12th graders
June 25 – June 30 Residential Camp for 7th – 9th graders

The League plans to offer two one-week concurrent residential programs of the Summer Mathematics Institute in 2023. It's full speed ahead!!

The first is for students entering grades 7-9 in fall of 2023.
Instructors:
Deb Fagan and Meg Bierwirth.
Topic: From Archimedes to Katherine Johnson to Po-Shen Loh to YOU!

The second is for students entering grades 10-12 in fall of 2023.
Instructors:
Dr. Ken Suman and Mike Hilst
Topic: Geometry in the MSHSML

MSHSML
SUMMER MATH CAMP
JUNE 25-JUNE 30, 2023

Augsburg University
Overnight Residential Only
Cost: $750

Eureka! From Archimedes to Katherine Johnson to Po-Shen Loh to YOU!

Join mathematicians on the problem solving quest! In this camp you will learn about the "A-ha" moments from mathematicians in the past and the present, and will be invited to join in the quest of discovering the math behind each problem.

Who: Students should be entering grades 7-9 in the Fall of 2023

Instructor: Deb Fagan & Meg Bierwirth

Intriguing Geometry and Relevant Problem Solving

We will investigate topics in geometry that are intriguing, not covered in textbooks and are highly relevant to problem solving. How familiar are you with the (i) Pythagorean area theorem, lunes and Leonardo da Vinci; (ii) the reciprocal Pythagorean theorem and the ladder theorem for areas; (iii) tangent circles, the arbelos and sangaku problems; (iv) centroids, center of gravity and barycentric coordinates; (v) the carpets theorem for overlapping geometric figures; and (vi) Ceva's theorem and the general area method?

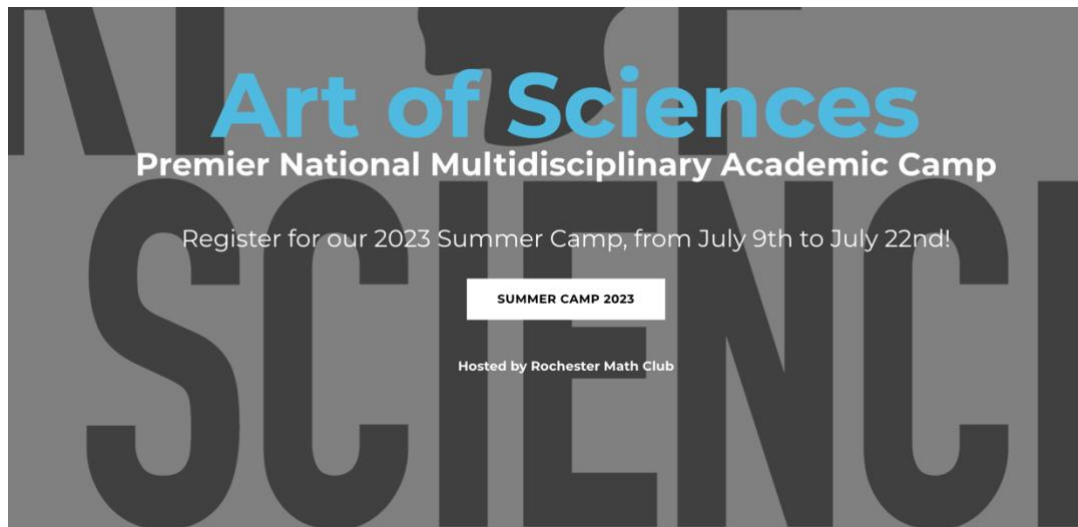**Who:** Students should be entering grades 10-12 in the Fall of 2023

Instructor: Ken Suman & Mike Hilst

APPLY AT THIS LINK: HTTPS://FORMS.GLE/NNJS1W4UVWNPNXSX6

2211 Riverside Avenue - CB 22
Minneapolis, MN 55454

mathleague@augsburg.edu
www.mnmathleague.org

Art of Sciences
Premier National Multidisciplinary Academic Camp

Register for our 2023 Summer Camp, from July 9th to July 22nd!

SUMMER CAMP 2023

Hosted by Rochester Math Club

Get ready to explore the Art of Sciences like never before!

Join us for an unforgettable multidisciplinary academic experience at the fifth annual Art of Sciences Summer camp, held from July 9-22, 2023 on the beautiful St. Olaf campus.
Designed for curious minds in grades 6 to 12, this academic camp is not your ordinary summer program.

Discover the wonders of mathematics, economics, photography, physics, biology, machine learning and AI, creative sound design, Python programming, business for youth, baking, and reading. With so much to explore, you're sure to find something that excites you.

But the learning doesn't stop there! The classes are followed by fun social activities in the evening, carefully planned and supervised by our friendly camp counselors. Indulge in sweet treats at the ice cream social, bond with new friends over s'mores, show off your skills at poker night, or unwind at movie night. Get active and enjoy the sunshine with ultimate frisbee, sand volleyball, swim, or frisbee golf.

This camp is open to students from all over the country, so you'll have the opportunity to make lifelong friends and experience a taste of Minnesota. Get all the information you need on our website, including details on our curriculum, instructors, schedule, and reviews from past years.

Don't miss your chance to join us for an amazing adventure into the Art of Sciences! Sign up now at https://www.rmc-academy.org/.

The Roberts Award Scholarship

The Roberts Award Scholarship(s) were established in honor of the League founder, Dr. Wayne Roberts of Macalester College.

The Scholarship(s) are offered to help offset the costs for students interested in attending an out-of-state math opportunity. They are offered once each year. A set amount of funds will be available each year, and multiple awards are possible.

Deadline to apply for this season is April 30, 2023

Applications can be found on our web site at: http://mnmathleague.org/?page_id=1033

===

===

Problem Corner

an effort to spur conversation

If you'd like to contribute a problem or send in a solution, email tomyoungmathman@gmail.com

Student solutions encouraged!

Newsletter #37 OEIS A047838

Define the organization number of a sequence of integers as follows: Start with the lowest number, and count the number of "steps" to reach the next larger number. Repeat until you reach the highest number, always keeping a running total. The sum of the steps is the organization number of the sequence.

For instance in the sequence 1, 2, 3, 4, 5 start with 1. It takes one step to go to 2, one step to go from 2 to 3, one step to go from 3 to 4, and finally one step to go from 4 to 5. A total of 4. Very organized!

Consider 3, 1, 5, 2, 4 start with 1. It takes two steps to go to 2, three steps to go from 2 to 3, four steps to go from 3 to 4, and finally two steps to go from 4 to 5. A total of 11. Very disorganized! There are other ways to be just as disorganized.

What is an example of a most disorganized row from a Sudoku puzzle? 1,2,3,4,5,6,7,8,9 is very organized

The solution would have an organization number = 39

Puzzler #38

$$1 + 4 = 5$$
$$2 + 5 = 12$$
$$3 + 6 = 21$$
$$8 + 11 = \, ?$$