



A message from the Executive Director, Tom Young

Hello all!

This first newsletter of the 2022–2023 season is a little bit late. My apologies.

Two meets are already finished; meet three comes up fast because of winter breaks. If you do not have school on Monday the 19th you are able to administer the meet on the Thursday or Friday prior.

So far, the new year seems to be going quite well. I thank Colin Gardner-Springer and the problem writing team for finding a great blend of accessible and difficult problems. Students are having success and at the same time are being challenged. This is what we hope for. Remember, a missed problem is an opportunity for learning!

I thank you for being a coach! It is your passion for mathematics that you pass on to your students. And, students reciprocate that passion.

But passionate coaches retire. Sometimes, when coaches retire, schools do not replace them. This leads to schools dropping Math League as a program. I hate to see schools leave the League because a new coach isn't found. If you are nearing retirement, try to help guide a new person to take over the role. If we can assist in any way, reach out to Sharin and me.

Getting new coaches is part of how we keep the league thriving. We have 20+ new coaches this year and 3 new schools that have never participated. A round of applause for them!! The three new schools qualified for our "Coach in a Box" program. I hope the experience has been rewarding!

Getting new schools is my focus for the future. Currently we have 165 schools in the League out of 400+ high schools (private, public, and charter) in the state. Our goal is to bring Math League to as many schools as we can. My hope?

Two Five Oh by Two Oh Two Five.

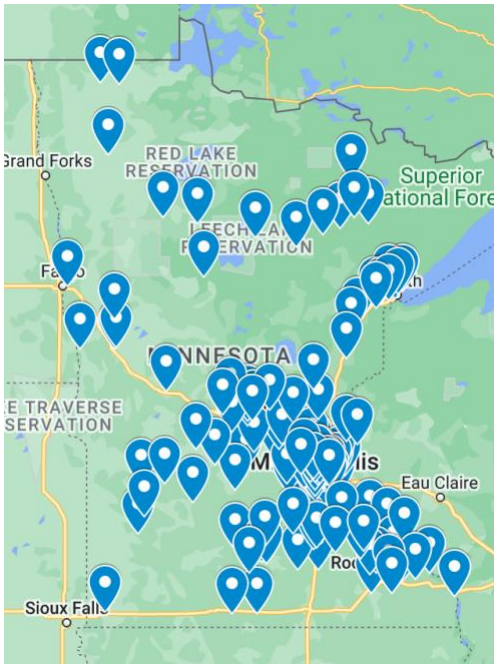
That's a lofty goal. Any help, leads, ideas for recruitment, and volunteering, would be welcome.

As Wayne Roberts, our founder, once said, "we have a good product." Help us find ways to add schools without subtracting our focus from the current year. If we divide our efforts across the state, we can be successful in integrating more schools into the League. We have the power to do so! (Can you forgive a new grandfather for corny yet heartfelt sentiments?)

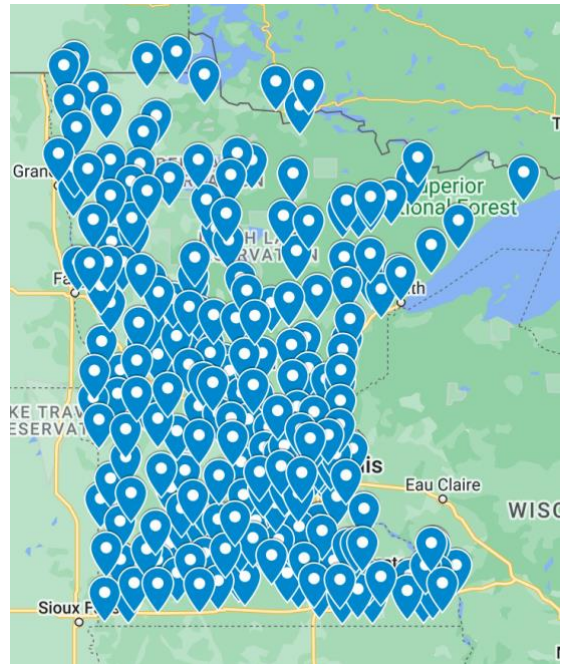
As a visual, see the next page for a map of the schools that do and don't belong to the League.

There's opportunity there!

Go Math Team!



Schools in League



Schools not in League

A message from Colin Gardner – Springer, Head of Problem Writing Team (HPWT)

Welcome to another season of Math League in Minnesota!

From a problems perspective, this year's big change is that calculators are no longer permitted during any round. We think this keeps the focus on developing problem solving abilities, and allows for a broader range of problems to be offered since we're no longer restricted from presenting interesting problems which would be trivial with a modern advanced calculator.

Thank you coaches for your commitment to the Math League in Minnesota. It's wonderful to see our numbers growing year over year. Please continue to reach out within your school and district to ensure that everyone who would benefit gets exposed to challenging math problems.

Finally, congratulations to Matthew Chen, Sam Kretzschmar, Andrew Zhang, and Katherine Zhu, the only four students to correctly solve the very challenging problem C4 on Meet 1! Well done!!!

Best of luck to all over the remainder of the season, and thanks again.

Colin Gardner-Springer

On behalf of the 2022-23 Problem Writing Team:
Don Barry, Michael Swenson, James Walker, and Roy Zhao

Coach in a Box Initiative

An initiative to find more Math League participants in High Schools in Minnesota.

The Minnesota State High School Mathematics League has launched the initiative “Coach in a Box” to expand the number of students who reap the benefits of participation.

Currently, 166 high schools and over 2,500 students participate in the Math League. We know that there are many more students across the state who would benefit, grow in their confidence, and understand more mathematics, if there was a team at their school. We have seen enthusiastic coaches start a team, find those students, and create a culture of mathematical “coolness.”

Our approach is to incentivize coaches and schools to create a new Math League team. Our “Coach in a Box” will provide many tools for a new school’s coach to find success while coaching a team. The “Coach in a Box” will provide:

- \$500 stipend for the coach for the 1st year
- \$500 grant to the school to assist with team development for the 1st year
- \$250 stipend for a coach from another school to mentor the new coach for the 1st year
- Resources and materials for the new coach to use to navigate the League procedures and topics
- Resources and materials for the new coach to use to recruit students and create a culture of coolness
- A thumb drive which houses the resources
- Access to a website that also houses the resources

If we can find enthusiastic coaches, students will follow!

If you are interested in starting a new team or donating to the effort, please contact Tom Young, the League’s Executive Director.

Email: tomyoungmathman@gmail.com or 763-568-0118

Go Math Team!

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 #33 Puzzler:

Source: Baltic Way 2018, Problem 6

Let n be a positive integer. Elfie the Elf travels in \mathbb{R}^3 . She starts at the origin: $(0, 0, 0)$. In each turn she can teleport to any point with integer coordinates which lies at distance exactly \sqrt{n} from her current location. However, teleportation is a complicated procedure: Elfie starts off *normal* but she turns *strange* with her first teleportation. Next time she teleports she turns *normal* again, then *strange* again... etc. For which n can Elfie travel to any point with integer coordinates and be *normal* when she gets there?

Solution provided at

<https://artofproblemsolving.com/community/c6h1734233p11252783>

We color a point (a,b,c) with white/black if $a + b + c$ is even/odd respectively. The Elf's first move will be at a point (x, y, z) with $x^2 + y^2 + z^2 = n$, and easy to observe that (x, y, z) 's color depends on the parity of n (white/black when n is even/odd, as $n = x^2 + y^2 + z^2 = x + y + z \pmod{2}$). As $(0,0,0)$ is even, if n is even then the elf only goes through white points, yet she'll never be on a black point. If n is odd, then the elf's points' colors alternate (1st move is black, 2nd white, 3rd black and so on). As she gets normal after an even number of jumps, she will not be on black points while being normal. Thus, there is no such n .

Newsletter #34 Puzzler (2019 European Cup Junior division problem 1)

https://artofproblemsolving.com/community/c3248_european_mathematical_cup

Every positive integer is marked with a number from the set $\{0, 1, 2\}$ according to the following rule: if a positive integer k is marked with j then the integer $k + j$ is marked with 0 . Let S denote the sum of the marks of the first 2019 positive integers. Determine the maximum value of S .

Proposed by Ivan Nova