



A message from the Executive Director, Tom Young

A big

Thank You

to all coaches and students for another great year of Math Team!

A special thanks to Associate Director, Sharin Park

and

what a super job by the problem writers!

and a tip of the hat to the Head of the Problem Writing Team (HPWT), Colin Gardner-Springer

Important nuts and bolts information

State Tournament: At the executive committee meeting in December, the committee decided to plan an in-person tournament. As a response to COVID, instead of gathering for a lunch banquet, teams can bring lunches to eat in their assigned team room. **We will not be providing lunches.** Masks will be required for all. No virtual participation will be allowed; if a team member tests positive for Covid, an alternate must be chosen to attend. If a team cannot muster enough participants, their spot in the tournament will be vacated. Individuals unable to attend the Invitational will vacate their spots in the Invitational. More information on state tournament procedures will be included in the information given to qualifying teams.

RECRUITMENT VIDEO Project (two submissions!)

I have a goal of increasing the number of participating schools and I'd like your help. I'd like to compile film footage of students and coaches participating in and talking about Math League. My thought is to edit the footage together and send it to ADs, principals, and superintendents in the state, advertising our great activity. We'd have to get the video to students somehow, also.

So, help by taking iPhone videos, or ask the film students in your school to make Math Team one of their projects. See a more detailed list of ideas for footage later in newsletter. Get Creative! Tell your story! Videos may go in the Coach in a Box. Go Math Team!

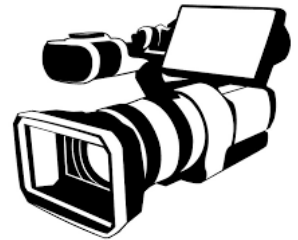
A message from Colin Gardner – Springer, Head of Problem Writing Team (HPWT)

Congratulations to everyone who participated in Math League this season! We hope you enjoyed the challenge and were able to add some new tricks and techniques to your problem solving repertoire.

Of course the season continues for those teams and individuals who qualified for the State Tournament; making it this far is a huge accomplishment! There will be some very tough problems to overcome at State; I'd encourage everyone to show up rested, then during the events relax, take your time, and enjoy the experience.

Despite being held in person, this year's Tournament events will follow the same constraints as during the regular season. Specifically, **all answers on the Individual, Team, and Invitational rounds are integers**, and calculator use is permitted during the Team round but prohibited on all other Events.

Finally, a special thanks to all coaches for their dedication to Math League, especially during the challenging past two years. Without you, none of this would be possible; thank you!



RECRUITMENT VIDEO Project Suggestions

1. Take footage of students solving an individual event. We will make a montage of several students solving problems and superimpose a timer in the corner.
2. Tell your story: Why did you get involved? What do you like about it? How do you deal with success and failure? What do you do for practice?
3. Describe and get footage of your Math League t – shirt if you have one.
4. What are your goals for the future? How will Math League help you attain them?
5. What are your goals for the League for this year?
6. What could be better about the League?

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 is launching 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 that 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 Math League team. Our “Coach in a Box” will provide many tools for a new 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 Impact of Math Team

The call went out in the summer of 2020 to Math League alumni to Share Your Story. Here is one alumnus who shared

Emilie Purvine

2002 Graduate of Mounds View HS

Undergraduate Degree: BS in Mathematics, University of Wisconsin

Graduate Degree: PhD in Mathematics, Rutgers University

Current Job: Senior Data Scientist for Pacific Northwest National Laboratory

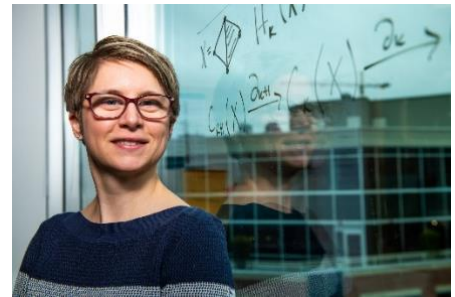


Photo credit: Andrea Starr | Pacific Northwest National Laboratory

The Impact of Math Team

I am a proud alum of the Mounds View High School math team from 2000-2002, and co-captain for the '01-'02 year.

I joined math team almost by accident. I had always been good at math, it came easy to me all through elementary and middle school, but it hadn't been a passion for me. Then along came 9th grade geometry and I absolutely loved it. My teacher was Mike Huberty, one of the math team coaches (although I didn't know that at the time), and he made the class really fun. So fun, in fact, that the following year I was jealous of my friends that were in geometry and asked them to give me extra copies of their worksheets! That's when one of them, probably annoyed by my constant requests for worksheets, introduced me to Dan Butler, the other math team coach, and I was promptly recruited for the team.

The longest lasting impact that math team has had on me is the role of mentoring in my life. Both Mr. Butler and Mr. Huberty were influential mentors for me. In fact, I went to college planning to be a high school math teacher, following in their examples. But that is not where my career ended up, I got too enticed by the mathematics!

I finished my undergraduate degree in Mathematics at University of Wisconsin and went on to earn a PhD in Mathematics at Rutgers University. Throughout both of those experiences, and other enrichment programs during my educational years, I encountered many more fantastic mentors. And because of all their examples I have chosen to make mentorship a core part of my job. I am a data scientist and mathematician at Pacific Northwest National Laboratory.

I'm incredibly lucky to have found a workplace that values mentoring of interns and early career staff and encourages me to perform outreach to students by going to universities or conferences and giving talks about my work or sitting on panel discussions about non-academic careers.

I might have gotten on the math path without math team, but I don't think it would have become a *passion* without math team. I also don't think I would have learned the skill of solving never-before-seen problems by identifying familiar sub-problems and assembling solutions piece-by-piece as early and completely as I did in math team. This skill helps me today in my job as I tackle real world problems from computer network analysis, computational chemistry and biology, and knowledge systems modeling by finding the mathematical nuggets and advancing the theory towards a solution.

Spreading the word about Math League

Greetings from Rena Erickson, our Social Media Manager.

Here's a list of things that would help in spreading the word about Math League in the virtual world:

- * Following the League's pages on Facebook, Instagram, and Twitter
- * Liking & commenting on posts (makes me feel good & it helps with the algorithms)
- * **Sending pictures of your team to mnhsmlsm@gmail.com**
- * Sending math-related articles/videos that are social media-friendly.
- * **Sharing stories about YOU, coaches making the League possible.**

Thanks for helping me share the awesomeness that is Math League.

Rena

Summer Coaches Conference 2022

Hall of Fame Induction **Dates: August 11 - 12**

We've had to postpone our 40-year celebration due to the pandemic. We are planning to hold a celebration this August honoring our new Hall of Famers and toasting to another 40 years!

Make plans to attend!!

2022 Summer Math Institute

June 26 – July 1 Residential Camp for 10th – 12th graders

June 27 – July 1 Day Camp for 7th – 9th graders

The League plans to offer two one-week programs of the Summer Mathematics Institute in 2022. So far, it's full speed ahead!!

One would be for students entering grades 7-9 in fall of 2022. **The topic would be Infinity.** The other would be for students entering grades 10-12 in fall of 2022. **The topic would be Writing and Solving ARML Power Contest Questions.**

Stay tuned!

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, 2022

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

ALL STATE TEAM UPDATE

This winter the Minnesota All-State Math Team (MN Math Team) will participate in three tournaments: the Harvard-MIT Mathematics Tournament (HMMT February 2022) and two flavors of the Carnegie Mellon Informatics and Mathematics Competition (CMIMC): CMIMC Math 2022 and (for the first time) CMIMC Programming 2022.

Harvard-MIT Mathematics Tournament (HMMT February 2022)

[HMMT February 2022 \(hmmt.org\)](http://hmmt.org) will be held online the weekend of 18-20 February, with Friday Night Events (games, puzzles), the tournament itself on Saturday, and Sunday Education Events (lectures). The problems in HMMT February are proof-based (yes, you must show your work) and thus generally considered more difficult than the more-conventional HMMT November tournament. The format certainly rewards those who closely read the proofs when studying. The MN Math Team has three 8-person teams competing. Linden Lee of Mounds View came in 3rd place in the Geometry contest. Way to go Linden!

Carnegie Mellon Informatics and Mathematics Competition–Math (CMIMC Math)

[CMIMC Math \(cmimconline.org\)](http://cmimconline.org) was held online Saturday, 26 February. The competition consisted of three Individual Rounds (Algebra and Number Theory, Geometry, Combinatorics and Computer Science), a Team Round, and a Theoretical Computer Science Round. The MN Math Team had three 6-person teams competing. Linden Lee was in the top 10 for Algebra/Number Theory and Combinatorics/Computer Science events. The MN Gold team of Jerry Zhang, Matthew Chen, Evan Erickson, Luke Patefield, Linden Lee, and Andrew Zhang placed in the top 10 teams.

Carnegie Mellon Informatics and Mathematics Competition–Programming (CMIMC Math)

[CMIMC Programming \(cmimconline.org\)](http://cmimconline.org) will be held online the weekend of 18-20 March. The competition consists of an AI Round (code written in Python 3) and an Optimization Round. The MN Math Team has three 3-person teams competing.

2022-23 MN Math Team & ARML

MN Math Team practices and team selection follow the mid-March Math League State Tournament. Selection of invitees in grades 6-12 is based on multiple criteria, including Math League scores, AMC 10/12 scores, AMC 8 and MATHCOUNTS scores (for younger mathletes-in-training) and, frankly, enthusiastic commitment: if you're interested, we encourage you to sign up by completing [this form](#). Current MN Math Team mathletes (including seniors) should complete the form too. A team of 64 mathletes will compete in the American Regions Mathematics League (ARML) national contest the weekend of 3-4 June (hopefully in-person at the University of Iowa)

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 #31 Puzzler:

From <https://www.math-only-math.com/fun-brain-math-puzzles.html>

8. In a certain code INKER is written as GLLGT and GLIDE is written as EJJFG. How will JINKS be written in that code?

- (a) GFOMU
- (b) HGMMU
- (c) HGOGH
- (d) HGOMU

Solution

INKER --> **GLLGT** the pattern is -2,-2,+1,+2,+2

GLIDE---> **EJJFG** the pattern is -2,-2,+1,+2,+2

so similarly,

JINKS--->**HGOMU** has same pattern i.e. + -2,-2,+1,+2,+2

Therefore the correct answer is "**HGOMU**".

Newsletter #32 Puzzler:

From 2019 Caucasus Mathematical Olympiad problem #1

In the kindergarten there is a big box with balls of three colors: red, blue and green, 100 balls in total. Once Pasha took out of the box 30 red, 10 blue, and 20 green balls and played with them. Then he lost five balls and returned the others back into the box. The next day, Sasha took out of the box 8 red, 18 blue, and 48 green balls. Is it possible to determine the color of at least one lost ball?