A message from the Executive Director, Tom Young

Wayne Roberts, our founder in 1980 (and Executive Director and problem writer for 30 years!) must be proud that the MN State HS Mathematics League has lasted 40 years. That's right – this is our 40th season of bringing extracurricular mathematics competitions to schools in Minnesota. Wow!

Our goal is to bring great mathematics to students who have unique talent and interest in mathematics. Our influence on students and teachers is deep. We have a long legacy!

The League continues to grow and evolve. The Board voted this fall to enact a weighted scoring system for determining top students in division standings and in state standings. See more on that later in the newsletter. Section assignments were made for the following two years. Those are listed later, too. Dana Koletar, our Associate Director, also emailed the section assignments to coaches a couple of weeks ago.

Stay tuned as the year progresses for the two summer activities that we coordinate: *The Summer Math Institute and the Coaches Conference.* **We hope to have a big splash for the 2020 Coaches Conference. If we find financial sponsors for the Conference, it could be REALLY big!**

Speaking of Sponsors: We are looking for business contacts that can help us support your team individually, your division, or the League in general. If you have a contact person, send the information along to Luke Olson at lolson@sspps.org

As always, my heartfelt thanks for all you do to help Minnesota students embrace the joy of mathematics!

2019 Summer Math Institute Pictures

In his book, The World of Mathematics, Vol 3, James Newman states, "The most painful thing about mathematics is how far away you are from being able to use it after you have learned it. ... In mathematics it is possible to acquire an impressive amount of information as to theorems and methods and yet be totally incapable of solving the simplest problem."

It is impossible to overstate the importance of problems and the necessity for improving one's problem solving ability. But, unfortunately, few non-standard problems are presented in a typical mathematics classroom. I have always felt that the MSHSML tries to fill this void with problems 3 and 4 in each Individual Event and the problems presented in the Team Event.

We all know that individual student success with these problems has room for improvement. But if improvement is to be made, it is important that students take time to look at and study the solutions. George Polya, author of How To Solve It and Mathematical Reasoning, believes that "problem solving is a practical art, and, like swimming or skiing or playing the piano, one can learn it only by imitation and practice."

So take some time to look at the solutions of problems from past years' Meets and Tournaments so that you might imitate them and hopefully improve your problem solving skills and scores in this, our 40th year.

Important changes voted on by Board members at September 29th Board Meeting

- Weighted scoring will be used to rank the top students across the state and also the top students in each division.
- Coaches will be able to see the students' raw score and weighted score on the scoring website.
- The team score will be the sum of the raw scores of its 8 scoring team students (4 students per event, 2 events per student) as per the League Manual. Teams that do not follow the League guidelines will be penalized. (NOTE: this is not a change but a point of clarification)
- Section ranking of teams will be based on ordinal scoring, just like the ordinal scoring in divisions.
- Ordinals will be assigned based on team raw score.
- Changes will go into effect this year, 2019 – 2020

More specifically, the Board members adopted these proposals:

WEIGHTED SCORING:
Weighted scoring will be used to rank students statewide AND students within each division, according to the following formula:

If correct,   (weighted *Question Score*) = (*Raw Score*) + $\ln \frac{1+(number\ of\ students\ attempting\ the\ question)}{1+(number\ of\ students\ correctly\ answering\ the\ question)}$

Else zero

At both levels, the numbers of students attempting and correctly answering the question will be based **only on the scoring teams**. That is, student statewide rankings will be based on all scoring members of all teams in the state. Division rankings will be determined based on scoring team members from teams within their division.

ORDINAL SCORING
Ordinal scoring will be used to determine section winners. At-large invitations would still be determined by raw score.

2019 Summer Coaches Conference Wrap – Up

David Patrick from Art of Problem Solving led several productive sessions on Thursday. Everyone should look up Liars Bingo at

https://aimathcircles.org/wp-content/uploads/2017/04/MTCircular-In-Session-WS2015.pdf

What a great activity!!!

2019 - 2020 and 2020 - 2021 Section Assignments

Class 3A Section 1	Class 2A Section 1	Class A Section 1
Century HS	Austin HS	Lake City
John Marshall HS	Faribault HS.	Chatfield HS
Mayo HS	Red Wing HS	Dover-Eyota HS
Lakeville North	Cotter	LaCrescent-Hokah HS
Northfield	Int. Sch of MN/Eagle Ridge	Lewiston-Altura HS
Farmington	Shattuck St.M	Plainview-Elgin-Millville HS
Lakeville South	MN Valley Lutheran	St Charles HS
Owatonna HS	Waseca	Wabasha/Kellogg HS.
8 teams	**8 teams**	**8 teams**

Class 3A Section 2	Class 2A Section 2	Class A Section 2
Shakopee Sr HS	Hutchinson HS	Fairmont HS
Eden Prairie HS	Delano	Blue Earth Area HS
Minnetonka Senior HS	St. Peter HS	Lake Crystal Wellcome Memorial HS
Edina HS	Dassel-Cokato HS	Luverne
Wayzata HS	Mankato West HS	Tri-City United HS
The Blake School	Mankato East HS	Stewartville
St Louis Park HS	Marshall HS	
7 teams	**7 teams**	**6 teams**

Class 3A Section 3	Class 2A Section 3	Class A Section 3
Park HS	Simley HS	New London-Spicer HS
East Ridge HS	South St Paul HS	MACCRAY
Eagan HS	Johnson HS	Lakeview HS
Eastview HS	Hill Murray HS	Holy Family Catholic
St Thomas Academy-Visitation	Como Park HS	Montevideo HS
Rosemount	Washington Tech HS	BOLD HS
Woodbury	Mahtomedi HS	North Community HS
Apple Valley	Highland Park	
8 teams	**8 teams**	**7 teams**

Class 3A Section 4	Class 2A Section 4	Class A Section 4
North St Paul HS	Minnehaha Academy	Providence Academy
Central HS	Mounds Park Academy	Hope Academy
Stillwater Area HS	Cretin-Derham Hall HS	Parnassus Preparatory Academy
White Bear Lake HS	Kennedy	Humboldt HS
Tartan HS	Roosevelt HS	St Croix Lutheran
St Paul Academy	Mound Westonka HS	Breck
Henry Sibley HS	Orono HS	Cathedral HS
Harding HS	Academy of Holy Angels	
8 teams	**8 teams**	**7 teams**

Class 3A Section 5	Class 2A Section 5	Class A Section 5
Champlin Park HS	Columbia Heights HS	Lourdes HS
Armstrong HS	Fridley HS	Zumbrota-Mazeppa HS
Maple Grove Senior HS	DeLaSalle HS	Cannon Falls HS
Osseo	Patrick Henry HS	Kenyon-Wanamingo HS
Rogers HS	St. Anthony Village HS	Triton HS
Mounds View HS	Totino-Grace HS	Pine Island HS
St. Michael Albertville	Edison HS	Goodhue HS
		Osceola HS
7 teams	**7 teams**	**8 teams**

Class 3A Section 6	Class 2A Section 6	Class A Section 6
Jefferson HS – Bloomington	Big Lake HS	Breckenridge HS
Minneapolis South HS	Princeton	Pelican Rapids HS
Southwest HS	Foley HS	Albany HS
Washburn HS	Monticello HS	Hillcrest Lutheran
Chanhassen/Chaska	Apollo HS	Atwater-Cosmos-Grove City HS
Hopkins HS	St, John's Prep	Park Rapids HS
Burnsville HS	Benilde-St Margaret's HS	Nevis HS
	Tech HS	Northern Cass
7 teams	**8 teams**	**8 teams**

Class 3A Section 7	Class 2A Section 7	Class A Section 7
Anoka HS	Hibbing HS	Barnum HS
Blaine HS	Chisago Lakes HS	Esko HS
Spring Lake Park HS	North Branch HS	Moose Lake HS
Coon Rapids HS	Cloquet HS	Mora HS
Irondale HS	Duluth Denfeld HS	Proctor HS
Roseville Area HS	Marshall School	Carlton HS
Cooper	Hermantown HS	East Central Secondary
7 teams	**7 teams**	**7 teams**

Class 3A Section 8	Class 2A Section 8	Class A Section 8
Moorhead HS	Bemidji	Badger HS
Brainerd	Alexandria Area HS	Greenbush-Middle River HS
Duluth East HS	Detroit Lakes HS	Mt. Iron-Buhl HS
Cambridge-Isanti HS	Fergus Falls HS	International Falls HS
Elk River	Sartell HS	North Woods HS
Sauk Rapids-Rice HS	Grand Rapids HS	Nashwauk-Keewatin
Andover HS	Rocori HS	Bagley
		Thief River Falls
7 teams	**7 teams**	**8 teams**
59 Teams	60 teams	59 teams

Fundraising Committee Report:

The League is always looking for sponsors who can help us with our mission. If you know of a company that we should contact, or know a person in a company that we should contact, email suggestions to Luke Olson at lolson@sspps.org

Some in-kind suggestions

Web site: our web site could use a new look and be streamlined better

Mentors/tutors: Local participating schools would welcome mentors/tutors for mathletes

Career counseling: mathletes would benefit from Career counseling

Monetary contribution suggestions

State-wide Transportation Fund: Increasingly, schools find busing costs to be onerous. Donations to a state-wide Transportation Fund for financially burdened schools would help keep schools in the League.

T-shirts: local schools often create T-shirts and might welcome a sponsor. We also sell T-shirts for the State Tournament. Sponsors could add their logo to the shirts, perhaps.

Calculators: we allow any calculator for competition purposes. Some calculators have more functionality. Some local schools would welcome an update of their calculators.

Fees for students: students pay participation fees at schools; sponsor could defray that cost.

Food at Meets and at State Tournament: we have a luncheon with awards at the state tournament. Divisions have end of season banquets and meet treats.

All State Math team competitions: each year, we take All-Stars from Minnesota to several college and national competitions. We charge the students for transportation, room, and board.

Summer Math Institute: each year, we develop a summer camp for 40 – 50 students. We charge $600 to cover the costs of teachers, room, and board. Hopefully we can reach more students if the price is better.

The Wayne Roberts Scholarship fund: This fund provides grants to students to enroll in mathematical camps/seminars. Each year we try to increase the amount in the fund.

Summer Coaches Conference: each year, we put on a Summer Coaches Conference to help train our coaches. Often, we bring in a guest speaker to help coaches increase the depth of their mathematical knowledge. A sponsor could help pay for the speaker or help with the cost of the social event.

Sponsorship of the League, in general

Do you have other ideas? Send them to Tom Young at tyoung@district16.org

Summer Coaches Conference 2020:

Many activities are being planned, including Hall of Fame Induction and Alumni gathering. If you know of alumni who might be interested, send us contact information.

Officer Election Results at September 29, 2019 Board Meeting:

President Stacy Paleen, Secretary Reid Froiland, and Treasurer Jenna Innes were re-elected to serve 3 – year terms ending in 2022.

Facebook Feature: Team of the Month

We'd like to start featuring team photos on our Facebook page. If your team would like to be featured, send a photo and a blurb about your team to Dana Koletar at mathleague@augsburg.edu

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, 2020

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

State Fair Outreach

On the first Thursday of the State Fair, SciMathMN sponsors a STEM day. Our League requests a booth each year to reach out to fair-goers and raise our profile. To do this, we ask Math League students to work the booth and share the joy of Math League mathematics. Here are some pictures of the students interacting with the public. They did a GREAT job!

The 2 solutions to the Problem Corner from Newsletter # 13

Fill in the ten blanks in the following statements in such a way as to make all ten statements true.

The number of times the digit 0 appears in this puzzle is 1
The number of times the digit 1 appears in this puzzle is 7
The number of times the digit 2 appears in this puzzle is 3
The number of times the digit 3 appears in this puzzle is 2
The number of times the digit 4 appears in this puzzle is 1
The number of times the digit 5 appears in this puzzle is 1
The number of times the digit 6 appears in this puzzle is 1
The number of times the digit 7 appears in this puzzle is 2
The number of times the digit 8 appears in this puzzle is 1
The number of times the digit 9 appears in this puzzle is 1

OR

The number of times the digit 0 appears in this puzzle is 1
The number of times the digit 1 appears in this puzzle is 11
The number of times the digit 2 appears in this puzzle is 2
The number of times the digit 3 appears in this puzzle is 1
The number of times the digit 4 appears in this puzzle is 1
The number of times the digit 5 appears in this puzzle is 1
The number of times the digit 6 appears in this puzzle is 1
The number of times the digit 7 appears in this puzzle is 1
The number of times the digit 8 appears in this puzzle is 1
The number of times the digit 9 appears in this puzzle is 1

NEW PUZZLER: The UK prides itself on its maths. Tuesday September 24th, 2019 was National Puzzle Day. This Sudoku was listed as the Everest of numerical games. Dubbed "the world's hardest Sudoku puzzle," it was published by Arto Inkala, a Finnish mathematician

World's hardest Sudoku

SOURCE:

https://www.telegraph.co.uk/education/educationquestions/12128579/National-Puzzle-Day-Can-you-solve-these-10-difficult-brainteasers.html