

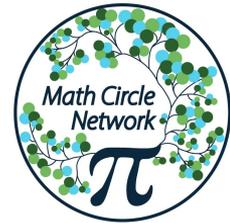


SIGMAA-MCST

Math Circle Virtual Resource and
Networking Fair



SIGMAA Math Circles for Students and Teachers



- ❖ We are the special interest group of the MAA on Math Circles!
- ❖ We also support the Math Circle Network and other Math Outreach organizations, which have members throughout the world.
- ❖ Our broad mission is to unite, inform and supercharge the Math Circle community! [Join us!](#)

Leadership team:

Chair: Gabriella Pinter

Chair-elect: Nick Rauh

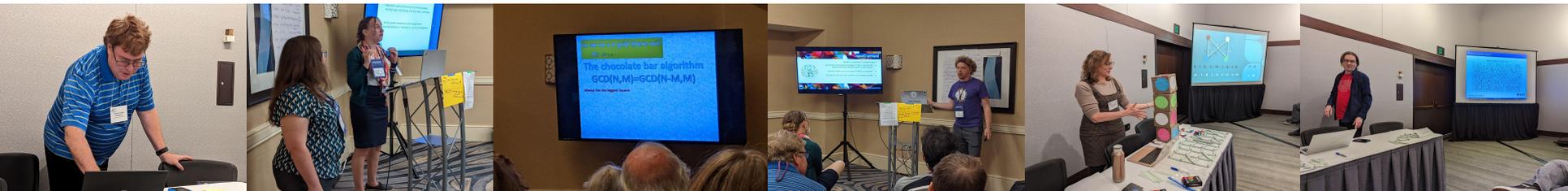
Past Chair: Lauren Rose

Secretary/Treasurer: Tom Stojsavljevic

Program Coordinator: Jeffrey Musyt

Web Editor: Ed Keppelmann

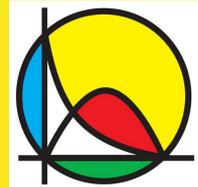
JMC Associate Editor: Tom Clarke



SIGMAA-MCST Activities

- ❖ Special sessions at the Joint Mathematics Meetings (JMM) and MathFest
- ❖ JMM 2023 Special Session: *Math Circle Activities as a Gateway into Mathematics* (20 speakers and standing room only!)
- ❖ MathFest 2023 Contributed Paper Session: *My Favorite Adapted Math Circle Topic* - submit an abstract at <https://www.maa.org/node/1301332/> (April 30)
- ❖ Minicourses: *How to Run Math Circles for Students and Teachers*
- ❖ *Rubik's Cubes, Pirate Treasures, and Mathematical Joy* in MAA FOCUS
- ❖ Slides, materials for presentations starting in 2011 at our website: <http://sigmaa.maa.org/mcst/>





JRMF Community Math Circle

Monthly Math Circles on zoom led by a community of volunteers since January 2022

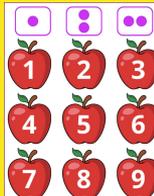
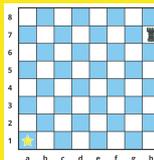
Collaboration with the Julia Robinson Math Festival (JRMF)

Test and use the apps for games and puzzles developed by JRMF



Preparation for sessions:

- Weekly leadership meeting
- Activity workshops by JRMF
- Facilitator training before the sessions
- Students grouped by age and experience
- After session discussions, feedback



bit.ly/cmcc-learn

Join us - we are always looking for new facilitators!

Navajo Nation Math Circles



Community
Leaders

Mathematical
family

Wonderful
Students



Program Components

- Public Math Festivals
- Two-Week Baa Hózhó Summer Math Camp
- Mathematical Visitor program
- Teacher Workshops
- Teacher Mentoring
- Summer Teacher Program

<https://navajomathcircles.org/>



Mathematics News Snapshots

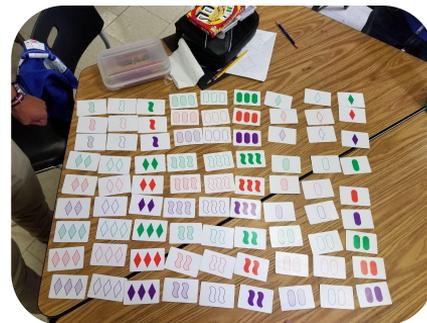
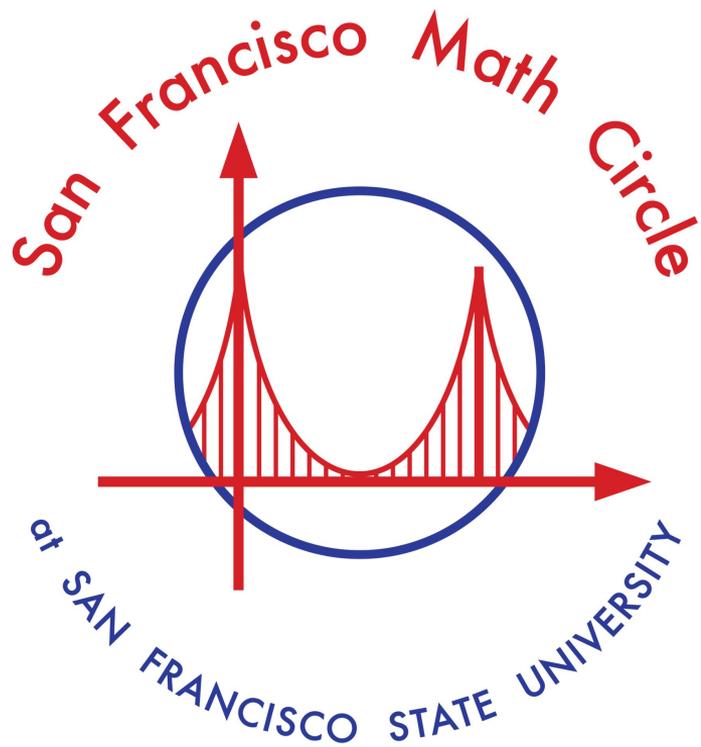
Bridging the gap
between school
and contemporary
mathematics

<https://mns.org.il>

<https://www.youtube.com/watch?v=uGnbpgLp1EI&feature=youtu.be>

<https://youtu.be/8uanD3PG4UQ>

The screenshot shows the homepage of the Mathematics News Snapshots website. At the top, there is a navigation bar with the logo "Mathematics News snapshots" and links for "Home", "About", and "Contact Us". Below the navigation bar is a large, colorful graphic featuring mathematical symbols like pi, infinity, and numbers, along with geometric shapes and equations. The main content area is titled "About the Project" and contains a grid of 20 article thumbnails. Each thumbnail has a title, a small image, and a right-pointing arrow. The articles include: Fermat's Last Theorem, The Kepler Conjecture, Catalan's Conjecture, The Map Coloring Problem, Origami: Where Art And Math Join Forces, Fibonacci Numbers: Myths and Facts, The Digits of Pi, The Mobius Strip and its Applications, A Surprising Discovery about the Digit 1, Random Walks, Soap Bubbles, The Art Gallery Problem, Goldbach's Conjecture: A Million Dollar Question, Mathematics, Music, Illusions and Paradoxes, Thou Shalt Not Covet Thy Neighbor's Cake, The Art and Math of Tiling, Prime Numbers - the Search and the Discovery, The Amazing Rubik's Cube, From the Complex Plane to the Infinitely Beautiful, Mathematical Matchmaking, Non Round Wheels - Can it be?, Developable Rolling Solids, The Million Dollar problem: is P = NP?, and The Monty Hall Problem. At the bottom of the page, there is a footer with the logo "Mathematics News snapshots" and a small text block: "© 2007-2017 The Mathematics News Snapshots Project. All rights reserved. The Mathematics News Snapshots Project is a registered trademark of the Mathematics News Snapshots Project. All other trademarks are the property of their respective owners." There is also a small text block at the bottom right: "© 2007-2017 The Mathematics News Snapshots Project. All rights reserved. The Mathematics News Snapshots Project is a registered trademark of the Mathematics News Snapshots Project. All other trademarks are the property of their respective owners."



San Francisco Math Circle is a project of the Center for Science and Math Education (CSME) at San Francisco State University.

SFMC offers after-school classes and camps for 2nd-8th grade students.

- We offer classes at SFSU that are open to the public
- We also partner with local schools to offer classes specifically for students at those schools

For our current Spring 2023 term:

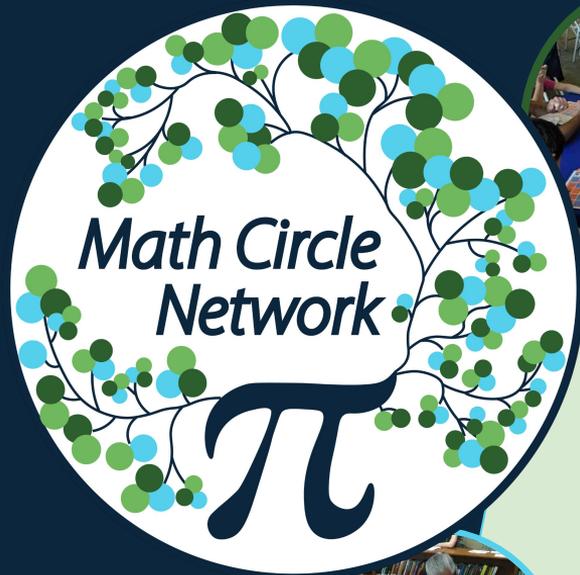
- 13 in-person classes
- Over 225 students
- 18 facilitators (most current SFSU undergraduate / graduate students)



Website: <https://www.sfmathcircle.org>

- Info about SFMC classes and camps
- SFMC's approach to math and math education
- SFMC activities
 - Feel free to use / adapt them however you want!
 - If possible, we would appreciate it if you would contact us (info@sfmathcircle.org or dklein@sfmathcircle.org) to let us know if you're using our activities. (We're also happy to discuss any questions you might have about how to facilitate our activities.)



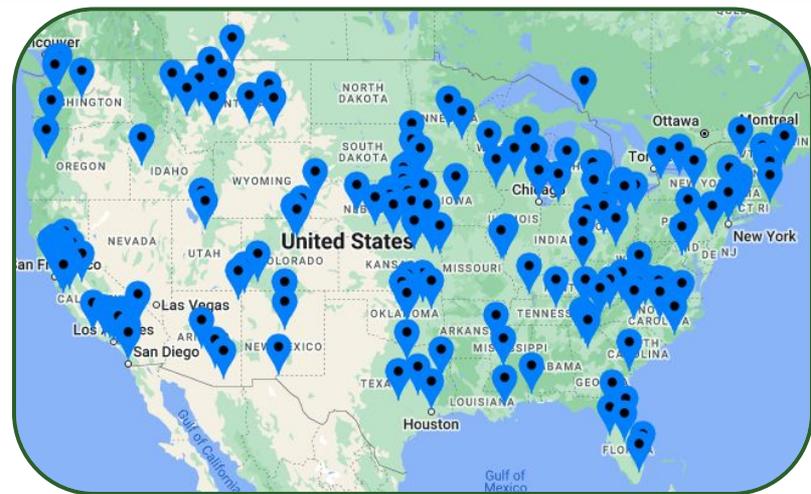


Our vision is for every student and teacher in the United States to have access to a Math Circle.

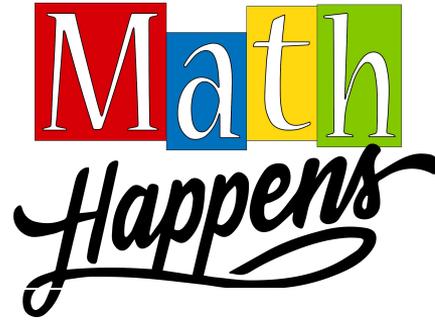
The mission of the Math Circle Network is to build, connect, and support local communities focused on the enjoyment of mathematics. We believe that Math Circles are powerful bridges among K-12 schools, higher education institutions, out-of-school programs, and families. We provide free resources for all Math Circles, with a special focus on supporting Math Circles that reach underrepresented or underserved students and their teachers.



- Over 200 active Math Circles across US
- Support for starting a Math Circle
- Free consultations & organizer resources
- Network calendar of upcoming events
- List & map of facilitators and mentors
- Database of 100 Math Circle activities
- Activities & accompanying resources
- Searchable by content & audience
- Multiple activity collections



A screenshot of the 'Activity Database' website. It features a search bar with three filters: 'Search by title', 'Search by author', and 'Search by Math Circle'. Below the search bar are three filter sections: '+ Grade' (with checkboxes for 1st-2nd, 3rd-5th, 6th-8th, 9th-12th, College Level, and For Teachers), '+ Topics', and '+ Supporting Materials'. Two activity cards are displayed. The first is '5 Squares Problem' by Javier Haro and Scott Kim, featuring a green geometric shape made of squares. The second is 'Bubbling Cauldrons' by Gord Hamilton, Javier Haro, and Spencer Bowen, featuring two red bubbling cauldrons.



www.mathhappens.org



We are Putting the “M” in STEM

We can pay for staff time and provide supplies for

Tabling and Math Rooms

We also offer and support for

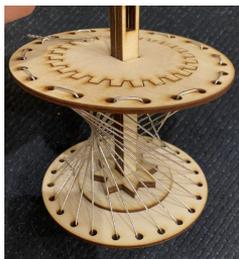
Micro-Internships and Outreach Projects

We are Looking for Partners!

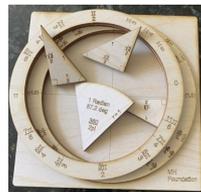
**Please Contact:
Lauren Siegel**

lsiegel@mathhappens.org

MathHappens @ Explora, Albuquerque, NM



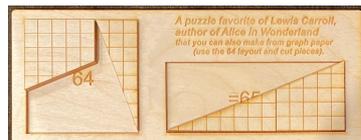
Math
Happens
No Paper Pencil
or Screens



Gerrymandering

$\frac{2}{3}$ for RED MOVE one Piece $\frac{2}{3}$ for ORANGE

Politics



Ingredients for Success:

- 1) You
- 2) A display or an activity
- 3) A Public Event or Space



IS WHAT YOU MAKE IT!

Natural Math

since 1996

Looking for co-leaders and volunteers:

- Online math circle for 5-year-olds with parents
- Local circles and events in Research Triangle, NC

We can help your math project with:

- Research and development
- Game and experience design
- Curriculum design
- Publishing
- Community-responsive work



MC² MATH CIRCLES OF CHICAGO



Math Circles of Chicago (MC2) creates opportunities for all children across Chicago to develop a passion for Mathematics
MC2 achieves its mission by providing free, unique enrichment programs for 3rd – 12th grade students of diverse backgrounds

Math Circles plays a critical role in making advanced math enrichment opportunities accessible for Black and Latino students, and students from households with low incomes, so that every student can experience the benefits of learning, doing and loving math. Math Circles also enriches the lives of teachers by giving them the opportunity to sharpen their skills in a different setting while giving back outside the school day.

Our Core Values

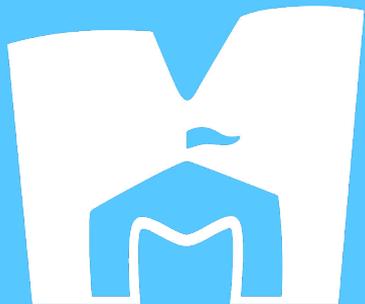
Math should be fun and empowering

Every child can and should do math

Every child deserves access to these experiences

Students should be the agents of their own learning

Math can and should be a collaborative endeavor



Julia Robinson Mathematics Festival





Our Offerings

- ◆ Activities with instructions, guides, and apps
- ◆ Workshops on our activities and engaging children in mathematics
- ◆ DIY Festival Planner & DIY Math Activities
- ◆ Event Planning over Zoom
- ◆ Virtual Volunteer Training over Zoom
- ◆ In-Person Volunteer Training
- ◆ Invite JRMF to Host Your Math Festival



Our Activities

- ◆ Fun and meaningful puzzles, games, and arts & crafts
- ◆ Designed to be tactile, visual, and body-kinesthetic
- ◆ Use a variety of manipulatives, including pattern blocks, number tiles, and jumping mats
- ◆ Foster collaboration and are accessible for all ages
- ◆ Created alongside math educators and mathematicians to reinforce the Common Core Standards for Mathematical Practice
- ◆ Help students build confidence, joy, and a positive identity around math



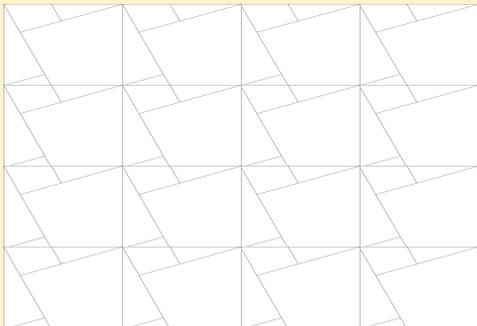


The Global Math Circle

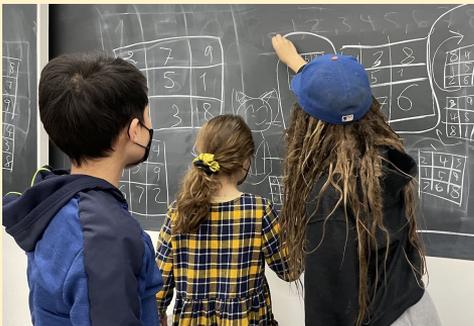
Mathematical exploration leading to deep understanding



Start with an
accessible mystery



Work together to
explore and discover



Create proofs based on our
discoveries

$$2 = \frac{2}{3-2}$$
$$1 = \frac{2}{3 - \frac{2}{3 - \frac{2}{3 - \frac{2}{3 - \dots}}}}$$
$$2 = \frac{1-2}{3 - \frac{2}{3 - \frac{2}{3 - \dots}}}$$



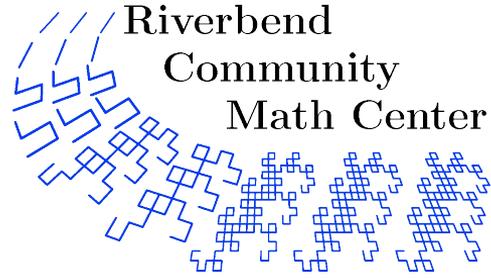
Leader Training Institute

Small, online class that is run like a math circle

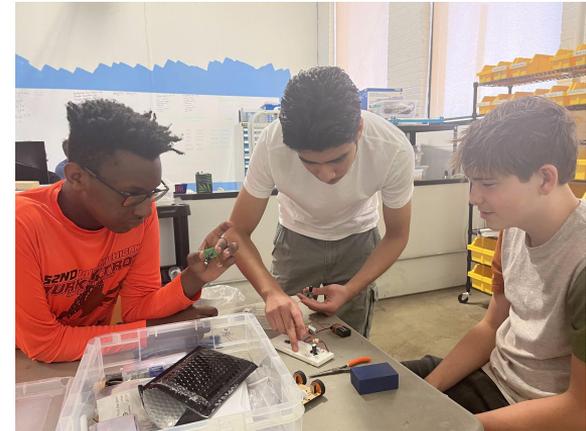
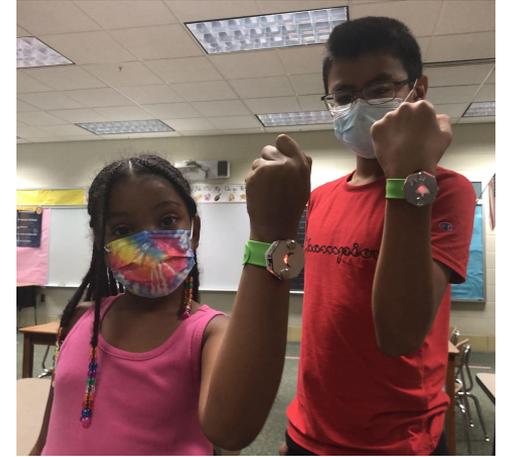
- **Create accessible mysteries**
- **Engaging, rigorous mathematics**
- **Inquiry-based problem-solving through productive questioning techniques**
- **Practice leading circles with kids and get feedback**

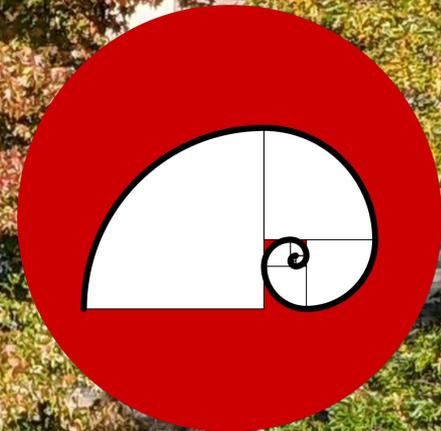


Training leaders to engage kids in problem solving and inquiry.



- Math Circles at Notre Dame
- Prototyping Team
- Advanced Math Pathways





Bard Math Circle
bardmathcircle.org

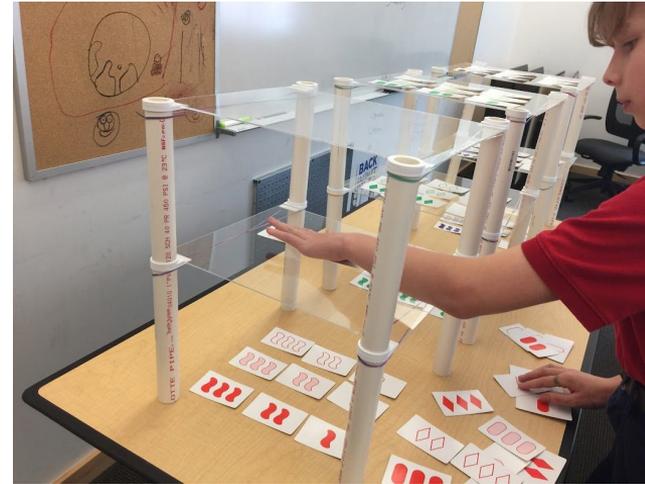
Triangle Math Teachers' Circle

- Founded in 2016 by Irina Kogan and Hector Rosario
- Purpose: Provide joyful math experiences for Triangle teachers
- Free monthly meetings during the school year
 - Past workshop leaders
 - Maria Droujkova
 - Gord Hamilton (online)
 - Ben Orlin (online)
- Yearly free day-long workshops
- Yearly summer immersion workshops through state organization (NCNMTC)
- Supported by grants, including AIM grant and NCNMTC



Triangle Math Teachers' Circle: Assets

- Great activities and meetings
- Relationships with Wake County Schools (10,000 teachers) and Durham Public Schools (2,000 teachers)
- 3 huge universities, many smaller ones and many tech related businesses.
- NC network of math teachers' circles



Triangle Math Teachers' Circle: Challenges

- Funding
 - Dollars
 - Access
- Attendance
 - No-show rate of 50%
 - About 10 teachers per meeting
- Leadership and organization
 - Asking teachers for their time and energy
 - Technology---web pages, social media
- Vision: Where are we going next?



Math *Mondays*





Math games in schools

Free program, easy to adopt

Gives kids a **positive weekly experience** of playing with math

Run by volunteers, using **existing packaged games** like Set & Rush Hour

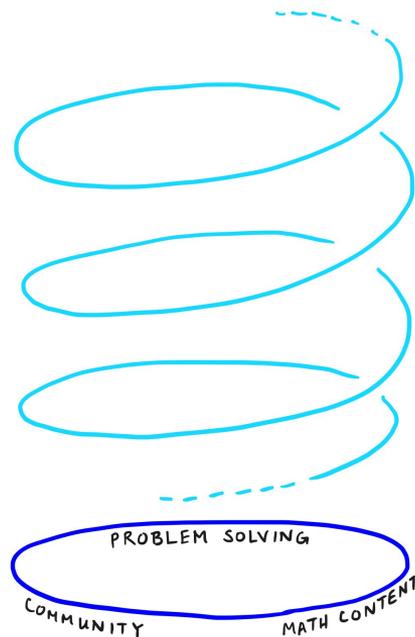
Being expanded into a **national program**, under mathcommunities.org

More info at: mathmonday.net, or email me at scott@scottkim.com



Journal of Math Circles

Editor in Chief: Brandy Wiegers
Central Washington University



<https://digitalcommons.cwu.edu/mathcirclesjournal/>

Mathematical Outreach through Math Circles

JMC Editorial Board

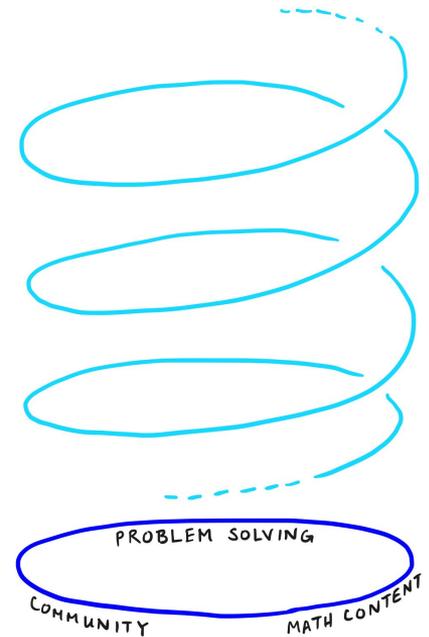
Editors in Chief:

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- Dan Zaharopol, Art of Problem Solving Initiative, Inc.

Copy Editor: Brent Hancock, Central Washington University



JMC Core Values

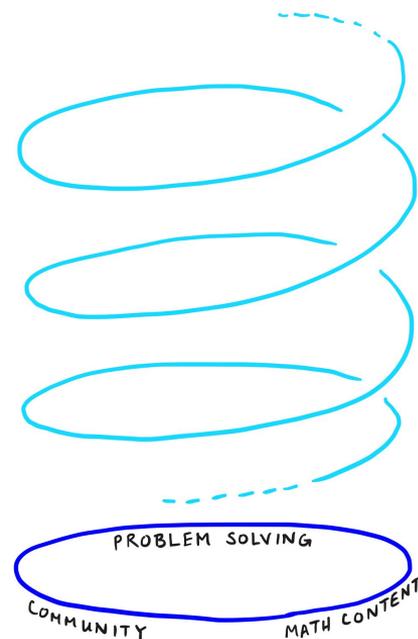
Exploring Worthwhile Mathematical Tasks¹

Math Circle tasks provide low-floor access to essential disciplinary questions, with high ceilings that connect to important, deep mathematical ideas.

Fostering Problem-Solving Habits of Mind^{2,3}

Math Circle problems are facilitated in ways that promote authentic mathematical experiences, where participants maintain agency in driving exploration of mathematics.

Building a Community of Mathematical Thinkers and Problem Solvers



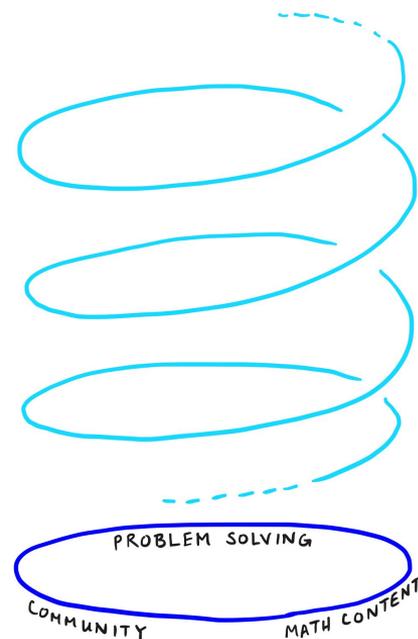
1. Cai, J., & Lester, F. (2010). Why is teaching with problem solving important to student learning. *National council of teachers of mathematics*, 13(12), 1-6.
2. Mason, J., Burton, L., & Stacey, K. 1982. *Thinking mathematically*. Addison-Wesley.
3. Selden, A., & Lim, K. H. 2010, October. Continuing discussion of mathematical habits of mind. In *Proceedings of the 32nd annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Columbus, OH: The Ohio State University.

3 article types

Lesson Plans. These papers are intended to support leaders of a Math Circle session or progression of sessions.

Outreach Programs. These papers are intended to support individuals or organizations in starting or sustaining Math Circle outreach programs.

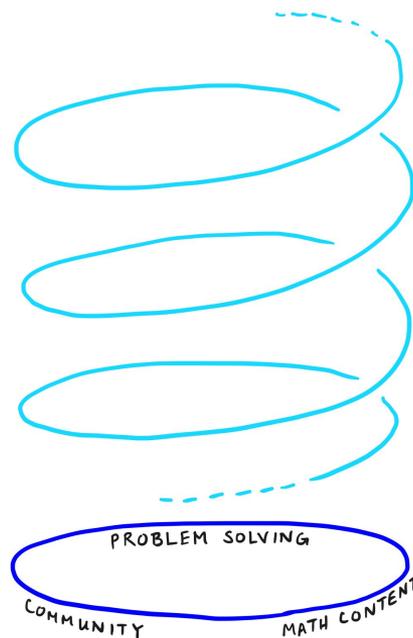
Professional Development. These papers are intended to support leaders of K-12 Math Circle teacher professional development





Journal of Math Circles

Editor in Chief: Brandy Wieggers
Central Washington University



<https://digitalcommons.cwu.edu/mathcirclesjournal/>

Stanford | Math Circle

Bringing pre-college students together with mathematically passionate instructors in an informal setting to work on problems and topics that encourage a sense of discovery and excitement about mathematics.

Currently online (2022-2023).

Offering weekly math enrichment. 27 sections, 700 students

- 1st-2nd grade (6 sections)
- 3rd-4th grade (8 sections)
- 5th-6th grade (7 sections)
- 7th-8th grade (4 sections)
- 9th-12th grade (2 sections)

Seeking additional guest instructors for 7th/8th grade and 9th-12th grade, and additional instructors for lower grades.

<https://mathcircle.spcs.stanford.edu/>

