



# COMMUNITY ENGAGEMENT SHOWCASE

**Math Literacy Program: Bridging Communities Through Math Outreach**  
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**Community Partners: Fern Bacon Middle School, Miwok Middle School, Hiram Johnson High School,  
 Luther Burbank High School, First Star Academy, Cardiovascular Wellness Program, Margaret McDowell Manor**



## Program Description

The purpose of the Math Literacy Program is multi-fold:

- [1] to build students' **confidence in mathematics**, and related literacies so that they can excel in their current classrooms,
- [2] to increase students' **mathematical skills** so they have the best future opportunities in education and the workplace,
- [3] to provide students with opportunities to **(re)learn foundational mathematical concepts** in hands-on ways that can alleviate the fear of mathematics.

Community partners with whom we worked include:

- First Star Academy: During 2023-2024 academic year, MLP mentors facilitated 12 one hour-long sessions on different hands-on fun math activities for youths in the foster care.
- Expanding Your Horizon Conference: This conference brings middle school girls to campus to experience fun-filled STEM activities. MLP mentors facilitated 3 sessions on different math activities such as Fractals, Spot it, and Logic puzzles. Additionally, MLP mentors ran a Career booth where they taught origami to 129 middle school girls.
- Introduce a Girl to Engineering Day for Middle School Girls: Mentors worked with 50 middle school girls on 4 mathematical puzzles.
- Fern Bacon Middle School: MLP is collaborating with a 7th and/or 8th grade math class since Fall 2019. We regularly visit classroom to work together with hands-on middle school curricular mathematics.
- Miwok Middle School: Mentors worked with 150 7th-graders from 5 sections on a logic puzzle game "Smileys."
- Margaret McDowell Manor: Mentors worked with 40 seniors on geometry game "Can you Spot it!," and other math games at 3 different sessions.
- Cardiovascular Wellness Program: Mentors presented two sessions on Math Games and the Brain to seniors.
- Carlton Senior Living: Mentors hosted a table with different math puzzles.
- Pi-Fest 2024: MLP hosted Pi-Fest on March 14, 2024 displaying 16 different pi-themed activities. Over 200 Sac State students attended the event.

## Program Highlight(s)

- Actively extended **math outreach efforts** throughout the community, serving individuals from **kindergarten** to **college-level students** and beyond.
- Successfully expanded outreach to include **seniors** in facilities, providing enriching **math experiences** to a new demographic.
- Organized **40 outreach events** during the 2023-2024 academic year, engaging approximately **700 middle school students, 200 high school students, 500 Sac State students, and 180 seniors.**
- Demonstrated **inclusivity** and **accessibility** by engaging learners from diverse generations and backgrounds, promoting **cognitive skill improvement.**
- Fostered partnerships with departments such as **Gerontology** and the **Cardiovascular Wellness program**, enriching programming with diverse perspectives and addressing holistic participant needs.
- Cultivated a **sense of belonging** by welcoming students from all majors interested in exploring math creatively and enjoyably.
- Empowered Sac State students through training to teach math engagingly, emphasizing the belief in the **enjoyment** and **making sense of mathematics** for all.

## Cultivating Authentic Partnerships

This program is committed to expanding access to math education for underrepresented students by creating an inclusive environment that fosters student ownership in the problem-solving process, whether they are acting as teachers or learners. MLP further bolsters each student's self-assurance by nurturing their inquisitiveness, promoting effective problem-solving, and building their self-efficacy. Mentors are trained in communication, teamwork, and diversity appreciation. They learn active listening, conflict resolution, and mutual support. Workshops and mentorship instill accountability and reliability for effective partnership collaborations, ensuring successful interactions with diverse community members. MLP offers different forms of community outreach:

- 1) Hands-on math activities, games, and puzzles on non-curricular mathematics
- 2) Hands-on K-12 curricular mathematics
- 3) Professional development of Sac State students
- 4) Celebrating voices in mathematics poster displays

To maintain and enhance the programming capabilities of this program, the program director has been leveraging their service learning courses, specifically MATH 107C and MATH 193. To tackle equity concerns regarding student access to community engagement and partnerships, the Program Director is actively collaborating with campus organizations. Together, they are developing initiatives to ensure students have ample opportunities to participate in events hosted on campus. By forging these partnerships, they aim to bridge any gaps in accessibility, thereby fostering inclusive participation and fostering a sense of belonging among all students.

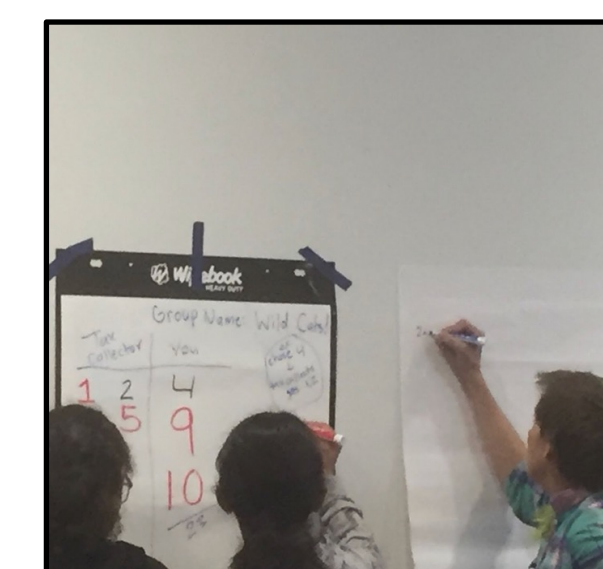
### MLP in Action



Mentors engaged in conversation about a math game with seniors.



Mentors hosted origami workshop for 129 middle school girls.



A mentor working with a youth.



Mentors tabled at the 6<sup>th</sup> Annual APIDA College Day.



Mentors facilitated Origami workshop.



Mentors facilitating maze puzzle at the IGED event.



Mentors engaged in conversation about math games with seniors.



Mentors facilitated a math and dance lesson with FYE.



Celebrating Voices in Mathematics Display.

## Community Impact

### A Quote from a Community Partner

Math teacher at Fern Bacon wrote, "you provide the hands-on activity for students to explore mathematics topics. The program provides the good amount of numbers of adults in the classroom that could provide 1-1 interaction that students needed. Also, a program provides the budget that supports the classroom materials that regular classroom teacher like me could not afford. Students will have a good experiences of how to generate the full definition of the mathematics vocabulary after they explore those topics themselves. The definition that they could use when they go to higher education. For me, a classroom teacher, the Math Literacy Program provides me opportunities to contribute to the higher level of students practices lesson plans. Professor Ghosh Hajra provided the lesson plans with good structured (Warm-up, main lesson, and exit ticket). An opened-ended questions provided students an opportunity to discuss and to explore."

### Campus Community Impact

One of the project impacts is developing a new perspective for students that mathematics is everywhere and there are different forms of mathematics beyond the curriculum. Math Literacy Program showcased that math is about problem-solving and creative thinking. MLP goes beyond academic instruction; it also serves as a platform for nurturing and honing professional skills among mentors. Through MLP, mentors not only impart mathematical knowledge but also cultivate essential professional attributes such as effective communication, leadership, adaptability, and mentorship itself.

### Quotes from Mentors

"I love doing puzzles, working with people, and thinking about math in different ways to really explore the subject. The Math Literacy Program has given me the opportunity to do all of these things as part of a team of kind, driven, and creative students."

"I got to lead a workshop during the Expanding Your Horizons event designed to build interest in STEM careers to middle school girls. There I learned about time management during lessons, presentation skills, and how to manage student engagement."

"I also want to mention that because of the MLP, I was invited to be part of an episode on the Building Justice podcast along with some other math majors, where we talked about inclusivity in the math major. The intersection of education and social justice is very important to me, and it was great to be a part of that dialog. In that way, MLP has also helped me feel a part of the STEM community at Sac State."

"The First Star Academy events were very beneficial to me. I'd only ever worked one-on-one as a tutor, so collaborating with the other MLP mentors to present a lesson to a whole group of high schoolers was a big deal to me. It was good to be able to experience that I could be pretty nervous and still perform adequately. It also showed me my strengths and weaknesses. I am always very prepared, but teaching to a group also requires thinking on your feet and adjusting your approach when things don't go according to plan. I think MLP has helped me get better at that. Across the semester, we began to implement vertical board work and other activities like the Math and Dance event that had students active on their feet instead of passive at their desks -- and that clearly had a positive effect on engagement. It was great to see that pedagogy in action."