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Multiplying Options for Success: Solving our National Math Crisis

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Math is needed to develop new technologies, as well as understand, and create new science discoveries. It's also the base of key life skills like financial literacy, problem-solving, and critical thinking. Declining math scores and diminished math skills threaten our nation's economy, security, and global competitiveness. Math declines also exacerbate educational inequities, continuing to widen the opportunity gap for millions of youth across the U.S.

Afterschool is a powerful solution for our young people.

In 2022, the National Assessment of Educational Progress (NAEP), reported the biggest decline in math scores in over 30 years.[1]

Only 26% of 8th graders and 36% of 4th graders scored proficient in math.[2]

Today, the average American student is 9 weeks behind in reading but an alarming 15-24 weeks behind in math.

The Challenge

Traditionally, in classrooms, STEM disciplines are presented in a siloed approach through equations with minimal real-world connections. This approach causes students to struggle to understand why math is interesting, useful, or important for their everyday lives.[3]

Math also has an equity issue with women representing only 29% of the mathematical sciences workforce. Black,LatinX, Native American individuals together account for only 14.2% of the mathematical sciences workforce.[4]

Math Skills are in High Demand

Strong math skills are in high demand, and companies are struggling to find qualified candidates to fill open positions.[5]

And, while 62% of K-12 students nationally say they're interested in STEM jobs, a third feel that their school is doing a bad job of preparing them for these careers.[6]

Emerald,
Million Girls Moonshot
2022 Flight Crew

"I was really scared to pursue STEM because I didn't feel like I was good enough. I wasn't confident in my work nor confident in myself, but through my afterschool experience I was able to grow and learn that anyone can get into STEM."

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2. Mervosh, S. & Wu, A. (Oct. 2022). "Math Scores Fell in Nearly Every State, and Reading Dipped on National Exam." New York Times.
3. Hughes, B. (April 2023). "New Research Shows Overwhelming Support for Improving Math Education." Bill and Melinda Gates Foundation Blog.
4. National Science Foundation. (2021). Women, Minorities, and Persons with Disabilities in Science and Engineering. Retrieved from https://ncses.nsf.gov/pubs/nsf21321/
5. Business Roundtable. 2023. "The Skills Gap Explained."
6. Langreo, L. (July 2023). "Students Want STEM Careers, But Think Schools Are Doing a 'Poor Job' Preparing Them" EdWeek.

Math in Afterschool and Summer

AN OPPORTUNITY TO ELEVATE MATH SKILLS AND INTEREST IN STEM CAREERS

Out-of-school time (OST) learning spaces provide the opportunity to approach math in a fun and intriguing way. Students actually gain greater comprehension and more positive attitudes about mathematics when learning in social settings with contextual, real-world approaches instead of memorization and textbooks.[7]

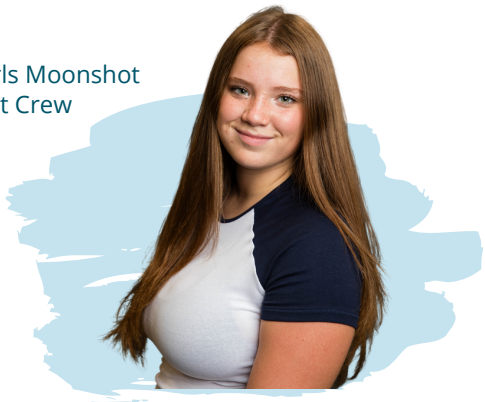
Operating outside of the traditionally siloed and disciplinary in-school approach, OST programs are poised to approach math concepts using real-world examples, in more social settings, and through an interdisciplinary lens. Here are a few powerful ways afterschool and summer programs can solve our math problem.

SPARKING EXPERIENTIAL LEARNING

Experiential, project-based learning - the type of learning found in afterschool - is an effective way to teach STEM skills. More active learning supports better comprehension and knowledge in math. Experiential learning involves hands-on activities that allow students to apply mathematical concepts in practical contexts, increasing a student's communication skills, critical thinking, and creativity. [8]

Henrietta and Nikhita, Million Girls Moonshot, 2022 Flight Crew

"For me, my STEM afterschool program was transformational. I found my voice. I found my confidence."



Adeline, Million Girls Moonshot 2023 Flight Crew

"Math helps you to critically think and find solutions that aren't readily apparent... School sometimes fails to be as engaging as afterschool, which can spark a competitive drive in you and just be fun and more interesting."

BUILDING YOUTH CONFIDENCE

Students with lower mathematics self-efficacy have a declining interest in STEM careers, highlighting the need to bolster a students' confidence.[9] Afterschool educators who support students with math have been shown to help young people overcome their fears and anxieties.[10]

BRIDGING GAPS & SUPPORTING INDIVIDUAL STUDENT NEEDS

Afterschool STEM programs can mitigate the impact of student math outcomes due to teacher shortages by offering skill-building opportunities that help make up for lost time in the classroom.[11] With smaller student-to-teacher ratios and flexible pacing, OST programming is better suited to support individualized student needs, thereby addressing learning loss, accelerating learning, and expanding opportunities for student success.[12]

Mayumi, Million Girls Moonshot, 2023 Flight Crew

"My high school's math team allowed me to discover topics of math that are not taught in the classroom. I was able to meet kids my age who were passionate about the same subject, and explore what I loved!"

7. Koskinen, R., & Pitkaniemi, H. (Feb. 2022). Meaningful Learning in Mathematics: A Research Synthesis of Teaching Approaches. International Electronic Journal of Mathematics Education. 2022, 17(2), em0679
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