



LIGHTS ON MATH IN MARYLAND RECOMMENDATIONS



Lights On Math in Maryland

October 26, 2023

ABOUT LIGHTS ON MATH IN MARYLAND

On October 26, 2023, as part of the National Celebration of Lights On Afterschool, a group of diverse stakeholders gathered at Morgan State University to answer an urgent question - What do we do about Math?

The statistics are real and dire. The challenge is not entirely pandemic related, declining math

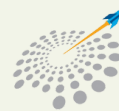
achievement has been. This has been an ongoing trend in the data from well before the impact of learning loss - though math seems to be the subject area with the least recovery.

The event, hosted by Morgan State University's Center for Excellence in Mathematics and Science and sponsored by the Annie E. Casey Foundation, was attended by K-12 educators, afterschool program providers, a state school board member, a legislator, representatives from higher education, parents, and students. Lieutenant Governor Aruna Miller provided a keynote address. Miller spoke passionately about the importance of math to her personally and the state's commitment to building strong pipelines to support Maryland's growing STEM Economy. [A video](#) from John Seelke, Incoming President of the Maryland Council of Teachers of Mathematics and Instructional Specialist, Secondary Mathematics at Montgomery County Public Schools, provided innovative ideas that schools and school districts can use. Dr. Darryl Williams, Professor of Practice at the School of Education & Urban Studies at Morgan State University, [spoke to strategies to excite students, teachers, and families about mathematics](#). Ellie Mitchell, Director of the Maryland Out of School Time Network, shared some of the staggering statistics for Maryland and [opportunities for OST \(afterschool and summer programs\) to be part of the solution](#).

After the presentations, four small groups worked to define the challenges further and develop actionable solutions and recommendations for the road forward.

The conversation's overarching theme was building authentic relationships with students to help students see themselves as "math people." The emphasis is important because students' perceptions of themselves as learners - how they feel about math may be the precursor to addressing challenges. "Math is too hard. I can't do math. I'm not a math person." These are commonly internalized messages that students tell themselves and frequently hear from friends, siblings, and family members. To overcome these narratives, teachers and adults that support young people need to be aware of them and then work to plant and grow new narratives.

ACTIONABLE RECOMMENDATIONS



MILLION GIRLS MOONSHOT

MOST is focusing on Math this year as part of our participation in the [Million Girls Moonshot](#) initiative.

1. BUILDING TRUSTING RELATIONSHIPS WITH STUDENTS

The pandemic highlighted the importance of school attendance for social, emotional, and academic development. Some students continued to thrive in online settings, but for many, interpersonal relationships are foundational for learning. With schools largely back to in-person instruction, more attention should be paid to [developing trusting and supportive relationships with students](#). The traditional structures of school that require grades and standardized tests as benchmarks can sometimes interfere with building a positive feedback loop. When students experience failure, that can quickly spiral into discouragement and create a disincentive to participate or try harder. Students lose hope. To bring back the spark, we must incorporate tried, true, and innovative strategies to reframe students' learning journeys. A few ideas that were generated at the forum include:

- Engage students early in dialogue about how they feel about math, their previous experiences with math, and how they see math playing a role in their lives. Connect math to various careers and help students see math as part of their career exploration. For example, math teachers can ask students to write their math biographies.
- Move away from repetitive and rote assignments in favor of incorporating more hands-on, engaging, and relevant math problems and problem-solving.
 - Games and gamification
 - Leverage student's love and native use of technology
 - Incorporate movement and physical activity
 - Applied connections to students' interests (sports, music, etc.)

An important caveat is that technology offerings must be vetted for quality to ensure they aren't just digital replications of less mindful activities on paper.

- Create opportunities for Maryland teachers to share effective lesson plans, tools, and ideas. One opportunity might include expanding [the Maryland Open Source Textbook \(MOST\)](#) to include K-12 resources (see [Virginia](#) for an example), prioritizing math instructional materials.
- Provide students with quick and actionable feedback that helps them see where they can learn from their mistakes and failures. Often, students have to wait until assignments and tests are graded to realize they are struggling with specific concepts. Lower stakes quick feedback mechanisms can help students course correct quicker. Similarly, when students make progress - celebrating intermediate wins can build positive momentum. Providing opportunities for students to rework and reflect on incorrect answers to recover credit or points can deepen learning and build math resilience.

- Ideally, struggling students would receive some kind of one-to-one or small-group tutoring support. If the teacher cannot provide tutoring directly, the outside tutor must also build a long-term and trusting relationship with the students they serve where possible.
- Design and implement near-peer tutoring programs utilizing established best practices. A growing body of research supports the benefits of using near-peer tutors to improve outcomes for both the younger student receiving tutoring and the older student providing tutoring. The younger students can be more receptive to the approach of their near-peers, while the older students solidify their learning through teaching. Examples include High School students working with Middle School students or College Students working with High School students. University partnerships with school districts can provide college students as tutors and mentors and additional support and instructional resources for teachers in the classroom.



Lieutenant Governor Aruna Miller giving the a keynote address at the Lights on Math in Maryland event on Oct. 26.

- Create structures for students to ask questions through feedback systems (note cards, email/text apps) that allow for more anonymous or protected systems. Students can be shy or fearful of ridicule and may not always seek clarification when they get lost in materials.

[Explore additional research and references on utilizing peer approaches in math tutoring.](#)

2. PROVIDING QUALITY TEACHING PREPARATION & ONGOING PROFESSIONAL DEVELOPMENT

Many conversations at the event focused on the need for additional focus on math in teacher preparation programs, particularly for elementary school educators who must train to be generalists but don't always have the same comfort level with math as other subject areas. In addition to developing comfort with content, the discussions on teachers also focused on the need to recruit diverse math teachers, for teachers to be knowledgeable of culturally responsive pedagogy, and the importance of relationship development discussed in the first recommendation. Themes from the small group discussions include:

- Increase the amount of emphasis on math for elementary school pre-service teachers.

- Create pipelines to incentivize diverse students to pursue careers in math education. This goal aligns with the goals of Pillar 2 of the Blueprint for Maryland’s Future and may be addressed by the state and local implementation plans but should get further attention from MSDE, the AIB, and the Pillar 2 Advisory Board.
- Offer more centralized and ongoing math-specific professional development opportunities that address culturally responsive pedagogy.

[Explore additional resources and references to utilize Culturally Responsive Pedagogy in Math.](#)

3. OFFERING EQUITABLE ACCESS TO OPPORTUNITIES OUTSIDE OF TRADITIONAL IN-SCHOOL INSTRUCTION

Afterschool and summer programs have a strong research base suggesting that participation in high-quality programs over time can improve student outcomes, including higher graduation rates, more advanced educational attainment, and even better earnings. Participation in afterschool and summer programs has been shown to help close the math achievement gap, particularly for students experiencing poverty. Participants in our forum felt there were great opportunities to engage students in fun, hands-on, minds-on math learning through out-of-school time (OST) programs. OST programs offer:

- Learning that is free of the pressures of assessment and fewer time constraints.
- Positive relationships with caring adults and peers.
- Opportunities to provide enrichment and acceleration.
- More personalized instructional models with lower teacher-to-student ratios.
- Strong relationships with families.
- College and career readiness, including work experiences and apprenticeships.

Summer, in particular, provides the opportunity to provide more immersive math experiences and help students with credit recovery, acceleration, and dual enrollment/college credit earning. Summer may be the key to helping students truly recover from the pandemic. An analysis of the investment in Summer programs provided by the state to districts in 2021 found that districts that offered diverse types of summer learning opportunities and partnered with community-based organizations served the greatest number of students.

Unfortunately, overall, ongoing state funding for afterschool programs has been reduced, and while many districts have used ARP/ESSER funding for afterschool and summer programs, the funding cliff is coming. Access to high-quality afterschool and summer programs shouldn’t be limited to families with the means to pay - though often opportunities are fee-based.



The small groups suggested:

- Increase access to and sustainability for afterschool and summer.
 - Utilize Summer programs to more directly address gaps in math instruction and/or provide acceleration opportunities for students who are ready, particularly in the bridge between middle school and high school.
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- Utilize youth development approaches to offer fun and engaging mathematics-based learning embedded within STEM and Arts offerings.
 - Provide guidance, training, and professional development for the best practices in afterschool and summer program delivery and incorporating math intentionally in these spaces.
 - Encourage community-based partnerships with school districts- creating additional alignment between school and afterschool instruction to reinforce but not repeat or replicate school-day instruction.
 - Utilize afterschool and summer programs for teacher training and recruitment purposes.
 - Leverage afterschool and summer programs' strong relationships with families for additional engagement and support opportunities focused on math.

[Explore research on the efficacy of utilizing afterschool and summer programs to boost math achievement.](#)

4. FAMILY ENGAGEMENT

Family Engagement in the subject of math does not receive enough attention, though literature suggests it could play a critical role in supporting students' math achievement. Our learners grow up and experience schools and other opportunities in the context of their homes and communities.

The pros and cons of the shift to Common Core math have been hotly debated. Regardless of where one falls on that subject, it is easy to recognize that parents and family members often feel disconnected, confused, and unable to assist their students with even basic “new math.” One participant in the forum recalled the need to “crowd-source” help with their child’s elementary school math homework on Facebook. In some cases, families have a generational distrust of schools and may reinforce students' negative perceptions of math and math skills with their prior experiences.

Family engagement doesn't always have to be a heavy lift. Events are great ways to engage families and communities but are not the only strategy.



- Provide families with lots of information about the coursework for the year and create easy pathways for family members to ask questions and get support.
- Develop a Family Math Toolkit that all school districts can utilize to engage families with math concepts through family communication platforms, social media, and special events. The toolkit would include an easily accessed and well-publicized repository of vetted tools, resources, apps, and games to share with family members.
- Make sure families (not just students) are aware of extracurricular opportunities and additional help like coach class or tutoring - post on electronic systems as well as send home with paper.
- Collaborate with afterschool program providers on family engagement events and communication strategies - using supports to engage families who speak languages other than English.

[Explore additional resources and research on engaging families with mathematics.](#)

POLICY IMPLICATIONS

- Establish a statewide Institute on Math Teaching to support teacher professional development, including cohort model learning communities, observation, coaching, an easy-to-access repository of the best curricula resources, and augmenting pre-service math learning opportunities.
- Provide teachers with stipends/mini-grants to design/pilot innovative instructional strategies and share their findings statewide - including an emphasis on engaging family and community, and share these resources through an open platform.
- Expand access to afterschool programs and provide training and professional development to program providers to incorporate math learning within a youth development framework. Include funding to engage families and communities.

- Fund peer and near-peer tutoring programs and partnerships -evaluate, sustain, and expand the [Maryland Tutoring Corp](#), which was funded with ESSER III dollars and will run out of funding unless reauthorized. In the future, MSDE could create similar grant programs that support partnerships between school districts and higher education.
- Develop the Family Math Engagement Toolkit that helps school districts and community partners engage family members early and often on math - particularly to support students through meeting the CCR, testing, and graduation requirements.
- Fully assess and then create a three to five-year action plan to address equity in access to math instruction and enrichment opportunities.

CALL TO ACTION

If you or your organization find these recommendations compelling, here are actions you can take.

1. Write a letter or email stating your support for these recommendations. Ask our leaders: *What are the next steps for math in Maryland?*

Governor Wes Moore

[Contact the Governor:](#)
[Governor.maryland.gov Forms](#)
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State Superintendent Dr. Carrie Wright

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2. Host a conversation in your jurisdiction to get feedback on these recommendations and build on these strategies with additional ideas generated by students, community members, and educators. We would happily attend, share our findings, and continue the dialogue. Send a request for event support to emitcheill@mostnetwork.org.

3. Share your ideas directly with MOST (emitcheill@mostnetwork.org) so we can continue to collect information from around the state to inform the evolution of these recommendations and advocacy.