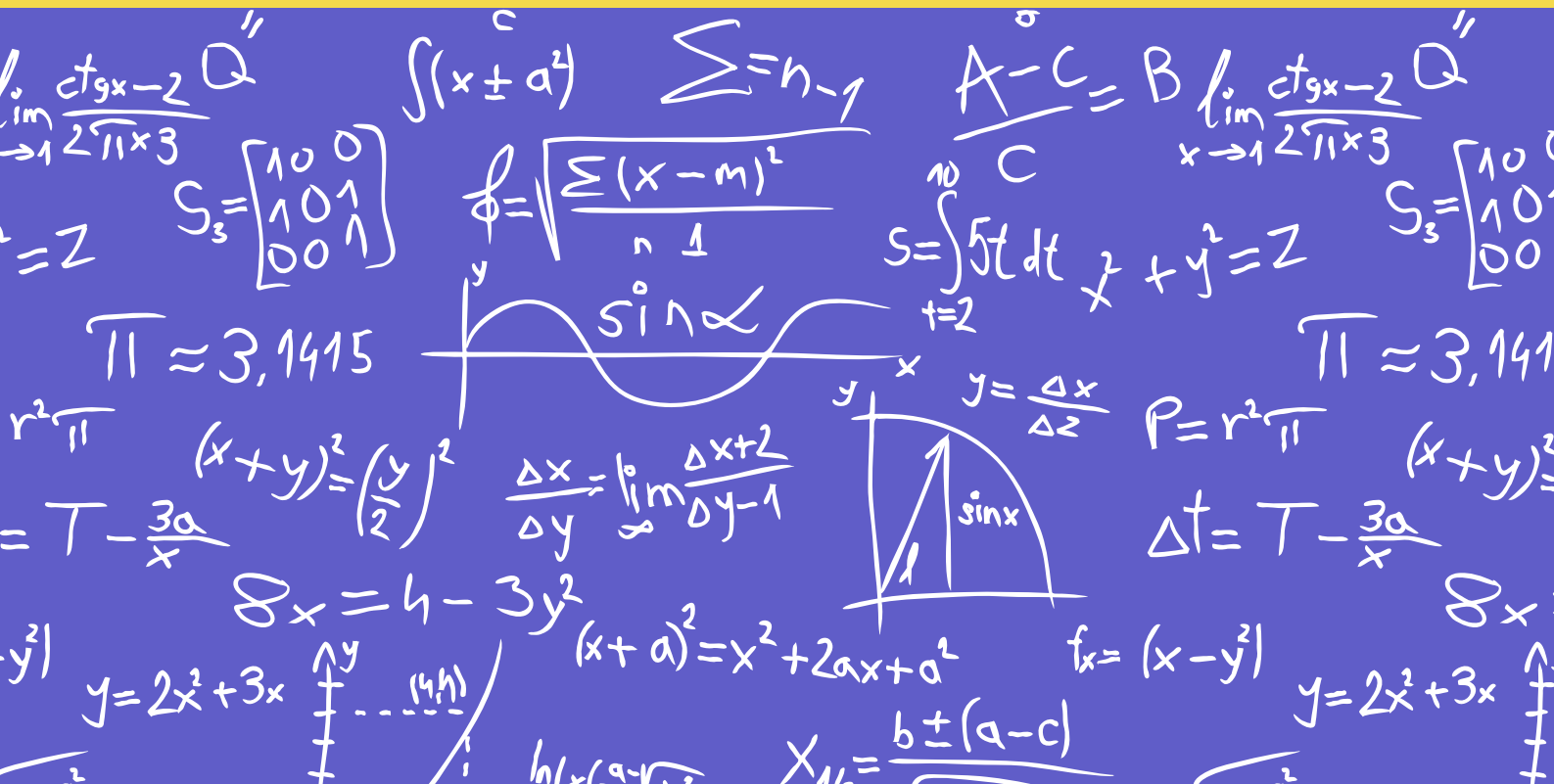


Adapted Measure of Math Engagement Professional Development Companion Piece



This resource is designed as a companion piece to the Understanding Black and Latina/o Students' Math Engagement: Sharing Year 1 Findings presentation. This resource is organized into 5 key topics:

Student-Teacher Relationships

Working With Peers

Family and Community Supports

Understanding Math Concepts

Feeling Motivated to do Math

Student-Teacher Relationships

When asked about Black and Latina/o students' math engagement, **student-teacher relationships was the most common topic discussed.**

Black and Latina/o students felt that they had a positive relationship with their math teacher when their teacher **expressed care and provided support.**



Students shared that they are much more likely to engage in math class if they can **connect with their math teacher.**

Another key to strengthening student-teacher relationships is **meeting your students where they are**, providing the right amount and kind of support for them to engage fully in your class.



We know you are already using a variety of strategies to build strong and positive relationships with your students! What new relationship-building strategies do you wish to try? What can you start doing?



How do you make sure **ALL students** feel welcomed in your classroom?

Actionable Insights



Build **intentional time** into classes to **get to know students** on a **personal level**.



Create a **supportive environment** in classrooms by **empowering** students to ask for help and answer questions.



Be **consistent**: offer regular opportunities (including “office hours”) to connect and answer student questions.



Create a **virtual classroom** resource library where students can connect with supports teachers have vetted.

Resources

- See Search Institute's Developmental Relationships Framework for relationship building strategies on expressing care, providing support, challenging growth, sharing power, and expanding your students' possibilities.
- Check out Search Institute's Developmental Relationships in Math Toolkit to further learn about relationship building strategies and activities in math learning spaces.
- See Along for free guide to research-based practices to support you in building relationships with your students.

Working With Peers

The theme of working with peers includes how students' relationships with their peers, both in and out of the classroom, either **supports or hinders math engagement** through actions like assisting with homework and offering encouragement.



When asked about Black and Latina/o students' math engagement, **working with peers was the second common topic discussed.**

For both math teachers and Black and Latina/o students, our research highlights the important role of **social connections and relationships** (for example, "social" engagement) in discussions about math engagement.



Think about the students in your classroom, what are the **existing peer relationships**?



How can you leverage existing peer relationships to **foster students' math engagement** (for example, seating arrangements)?

Actionable Insights



Acknowledge students for helping or supporting others in math; a simple word of encouragement can go a long way.



Navigating peer relationships can be tricky. **Give autonomy to students and respect their preferences for working with others during teamwork.**



Acknowledge that some students genuinely prefer to work alone, especially if they perceive other students to be too distracting.



Role model working with friends/peers by **collaborating with other educators** on collaborative assignments.

Resources

- Review Digital Promise's middle and high school math strategies handbook for evidence-based practices on integrating peer teaching into your classroom.
- Take a look at Cornell University's Center for Teaching Innovation's blog post that highlights collaborative learning considerations and strategies for introducing it into your classroom.
- Check out PowerUp What Work's guidance on creating peer collaborative learning sessions that align with Common Core Practice Standards.

Family and Community Supports

Our third most mentioned topic related to math engagement is **family and community supports**.

Every student is embedded in **webs of relationships** that can support their math engagement.



We view these family and community supports as **assets**. For example, family expectation for students to be successful could be a motivating factor that supports math engagement.

Bloomington has several resources that leverage Black and Latina/o students' family and community assets to support their math engagement, including: cultural-specific student clubs and safe spaces, language support, and cultural liaisons.



Think about all the things that students bring into the classroom, **how can their unique identities, cultural backgrounds, and community resources** help you engage them in the classroom?

Actionable Insights



Connect with families about their students' math engagement and **support them** in helping their students.



Acknowledge parental support, even if some may not assist with homework due to reasons like discomfort with math or busy schedules; their emotional and other forms of support are still **valuable and valid**.



Connect with families **through virtual or in-person communication**, utilizing methods such as school community building days, classroom office hours, emails, or phone calls. Identify and use linguistically and culturally appropriate communication with families.

Actionable Insights Cont.



Address barriers to parental involvement by implementing measures at the school or district level, such as language interpretation services, community events, and accessible materials.



Introduce students to **math role models** that resemble your students' backgrounds.



Uplift each **student's community assets** that they have direct or indirect access to beyond your classroom.



Actively intervene when you hear people (even students themselves) say stereotypes that are harmful to your students' math engagement.

Resources

- Read through this short [infographic](#) designed by Regional Educational Laboratory Appalachia's Engaging Community to Promote Math Learning for strategies on school-community partnership.
- A common barrier to family engagement is the parents' own beliefs and mindset about math. Consider sharing Regional Educational Laboratory Northwest's [5-minute video](#) about How to Boost Your Middle Schooler's Math Confidence and Success.
- Check out Regional Educational Laboratory Pacific's [infographic](#) about how to bring community and family voice into your math classroom.

Understanding Math Concepts

The fourth topic is **understanding math concepts**.

This finding speaks to math competency as a **core foundation** for math engagement.



On the positive side, when students **understand math concepts** they described feeling confident and happy, which makes them feel more engaged in math.

On the negative side, when students **don't understand the content**, they described feeling frustrated, stressed, and falling behind, all of which are barriers to engagement.

Teachers and students mentioned several factors that made understanding math challenging which include: learning new concepts **too quickly**; math's sequential nature making it **challenging to catch up**; too much **homework**; and **stigma about making mistakes** and what others will think of them.



How do you **currently check** for understanding in your math classroom?



How do students respond when they **do understand**? How do you respond when students **do not understand**?

Actionable Insights



Conduct **daily pulse checks** on how quickly you're moving through lessons and units to make sure all your students feel like they're **able to follow along** and comprehend the material.



Offer opportunities for **1:1 or small group sessions** outside of class time for students who may need **extra support** in understanding the content.



Normalize **making mistakes** in your classroom environment. Creating an environment where it is normal to make mistakes can help the frustration from turning into stress and falling behind.

Resources

- Check out Equitable Math's A Pathway to Equitable Math [Instruction Toolkit](#) for ways to deepen your students' conceptual understanding through orchestrated math discussions that build on and connect multiple strategies.
- Review Institute of Education Sciences' [infographic](#) that shares a framework and additional resources for supportive conditions in mathematics.
- Read Great Mind's [blog](#) on how to guide students to a deep understanding of math concepts.

Feeling Motivated to Do Math

The fifth most discussed topic highlights how **motivation and engagement go together**.

When discussing motivation, students and teachers commonly talked about **expectations and how math related to their future**.



Students shared how expectations affected their motivation. These insights included: expectations were **external**; expectations were set by teachers, classroom environments, or family members; and expectations had both **positive and negative impacts on motivation**.

A key part of math motivation pertains to **how useful or relevant math is**. Some ways that students described this included: the importance of grades for getting into **college; their future career**; and wanting to have or be good with money.



What expectations do you have in your classroom that **support motivation** to do math?



What are some ways that you connect the math content in your classroom to your **student's everyday lives and futures**?

Actionable Insights



Collaborate with students to establish classroom expectations and norms regarding learning and engagement.



Provide opportunities for students **to have choices** in their learning within the classroom.



Collaborate with students to create **feedback pathways** for situations where teachers or students are not meeting expectations or norms.



Leverage **easy wins** in your classroom to boost student confidence and motivation in math.

Actionable Insights Cont.



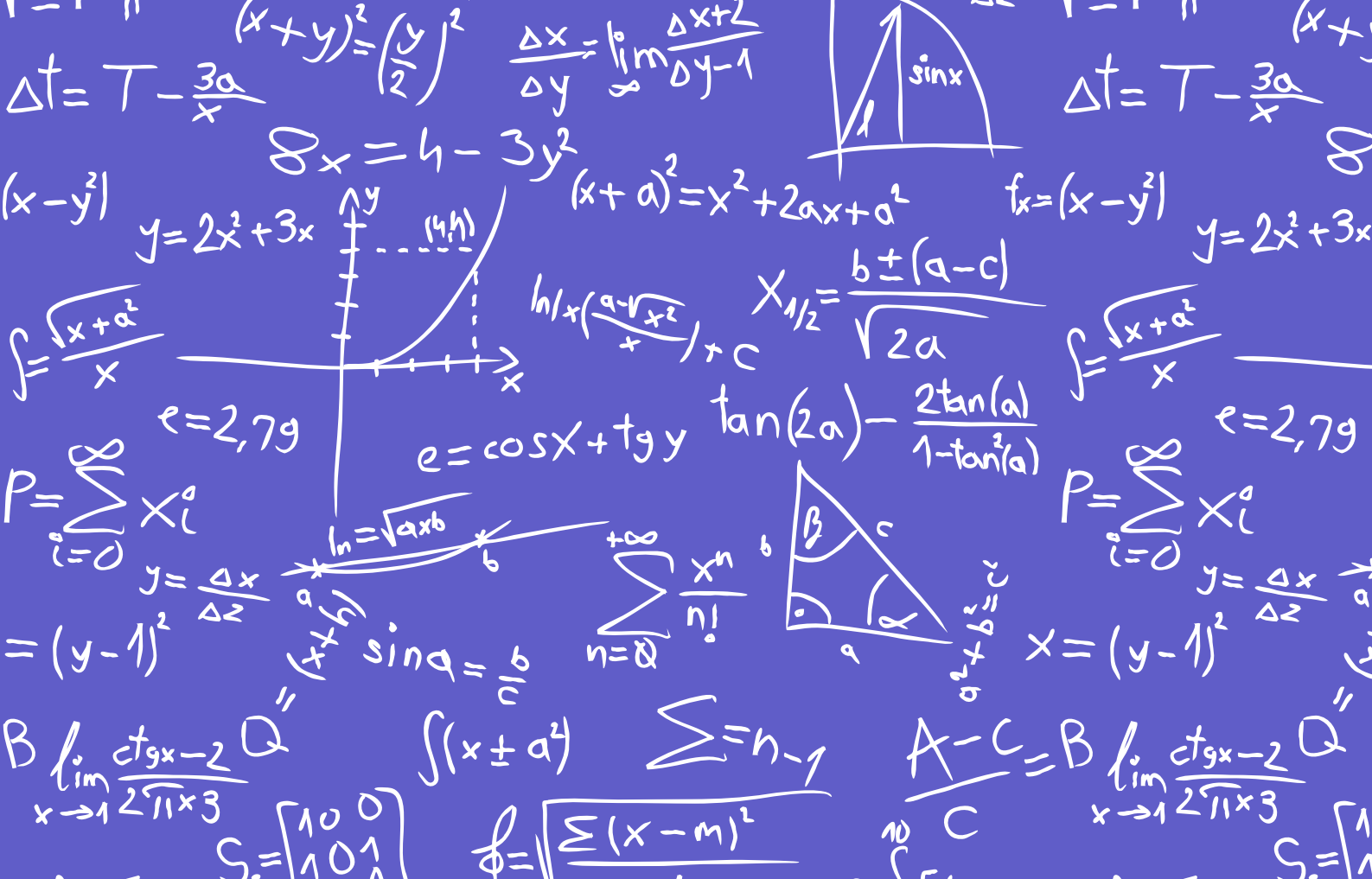
Provide in-class time for students to complete work and provide space to ask questions and check their understanding.



Collaborate with students to generate ideas for rewards or other motivators that can enhance their engagement in lessons.

Resources

- Check out Regional Education Laboratory Northwest's Building Positive Math Attitudes Training Series for research summaries, guides, and strategies to strengthen your students' math self-efficacy, sense of belonging, and growth mindset. A brief summary is here.
- Check out Alfred Posamentier's 9 Strategies for Motivating Students in Mathematics blog via Edupotia for ideas that could be easily applied to your math classroom.
- Leverage resources like I Am A Scientist to introduce diverse math role models that resemble your students' identities and backgrounds.



The research presented in this companion piece was conducted by the Adaptive Measure of Math Engagement research group.

The research group includes five students (Aubrey Caldwell, Antonio Chavira, Brianna Espy, Serrah Ssemukutu, and Diamond Tony-Uduhirinwa), five teachers (Nate Earley, Karina Meyer, Kathleen Morgan, Karla Rokke, and Ashly Tritch), and five researchers (Marisa Crowder, Samantha E. Holquist, Diane (Ta-Yang) Hsieh, Claire Kelley, and Mark Vincent B. Yu). Alyssa Scott and Laney Taylor also extensively contributed to this work.

This project is funded by the National Science Foundation, grant #2200437. Any opinions, findings, and conclusions or recommendations expressed in these materials are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.