Understanding Black and Latina/o Students' Math Engagement

Sharing Year 1 Findings

The Adapted Measure of Math Engagement Project

Spring 2024

Bloomington Public Schools

Child Trends

Search Institute

McREL International

National Science Foundation

Thank you for being here!

We are sharing key findings from Year 1 of a research project being conducted at Bloomington Public Schools that provides insight into **how middle and high school Black and Latina/o students engage in math**.

Agenda and Objectives

1. Overview of the project
2. Five major findings about how Black and Latina/o students experience math engagement
   - Student-Teacher Relationships
   - Working With Peers
   - Family and Community Supports
   - Understanding Math Concepts
   - Feeling Motivated to Do Math
3. Wrap up and and next steps

The Research Project

What?

Who?

How?

Our goals are to…

- Understand Black and Latina/o students' engagement in math;
- Create a survey of student engagement to better capture Black and Latina/o student's experiences; and
- Understand how students' math engagement supports academic and socio-emotional outcomes.

The Research Project

What?

Who?

How?

This is a community-engaged research project being conducted *with* Bloomington Public Schools.

- One student and one teacher representative is on the research team from each of the five Bloomington middle and high schools.
- There are also researchers from three non-profit research organizations: Child Trends, Search Institute, and McREL International.
- We (students, teachers, researchers) met regularly to plan, collect data, discuss findings, and make other research decisions.

The Research Project

What?

Who?

How?

We collected a variety of data in Spring 2023 to better understand Black and Latina/o students' math engagement:

- **Math engagement survey** (i.e., the Math and Science Engagement Survey) administered to all middle and high school students (Approximately 2,000 surveys)
- **Focus groups** with middle and high school students (N = 50 in 9 groups)
- **Interviews** with middle and high school math teachers (N = 8)

The Research Project

What?

Who?

How?

This project is taking place from Fall 2022 to Spring 2025. We plan to share findings at the following points:

- Year 1 findings will be shared in Spring 2024 (now!)
- Year 2 findings will be shared in Fall 2024
- Year 3 findings will be shared in Fall 2025

Year 1 Findings

Note that all names have been changed to protect student, teacher, and school identities. Race/ethnicity and gender were self-described by each participant.

Student–Teacher Relationships

Student–Teacher Relationships

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

- This aligns with research that shows **teachers** are one of the most important factors that shape students' math engagement.
- The way teachers *deliver* math content is as important as the content itself. Positive student-teacher relationships are the *conduit* for learning.

Student–teacher relationships was mentioned in 6 out of 8 teacher interviews and all 9 of the student focus groups.

Student-Teacher Relationships

Black and Latina/o students felt that they had a positive relationship with their math teacher when their teacher:

Expressed Care

Provided Support

According to the *Developmental Relationships Framework*, other important approaches to strengthening student-teacher relationships include:

- **Challenge Growth:** Encourage your students to keep getting better and learn from mistakes.
- **Share Power:** Treat your students with respect and give them say.
- **Expand Possibilities:** Connect your students with people and resources that broaden their horizon.

Expressing Care

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

A foundational part of building student-teacher relationships is to **Express Care**, or show your students that they matter to you.

"And she, like, **cares to get to know you** not just, like, on a school level but also, like, she cares to get you know-- to get to know you **as a person**, like, outside of school."

- London, a Black female student at Helen Rodríguez Trías High School

Expressing Care

On the flip side, if students cannot sense that you care about them, it is much harder for them to engage in your math class.

"Probably **[the teacher] being mad from the other class**. It kind of, like, brings you down, like **you did something wrong but you had nothing to do with it**."

- Amari, an African American female student at César Milstein Middle School

Providing Support

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

"**I try to support them**. I try to **be there for them as a human** first. At the end of the day, if they find safety and support in my classroom and they enjoy being in my space, then they're absorbing more being in my room than they would be acting out and not being in my room."

- Meg, a math teacher at César Milstein Middle School

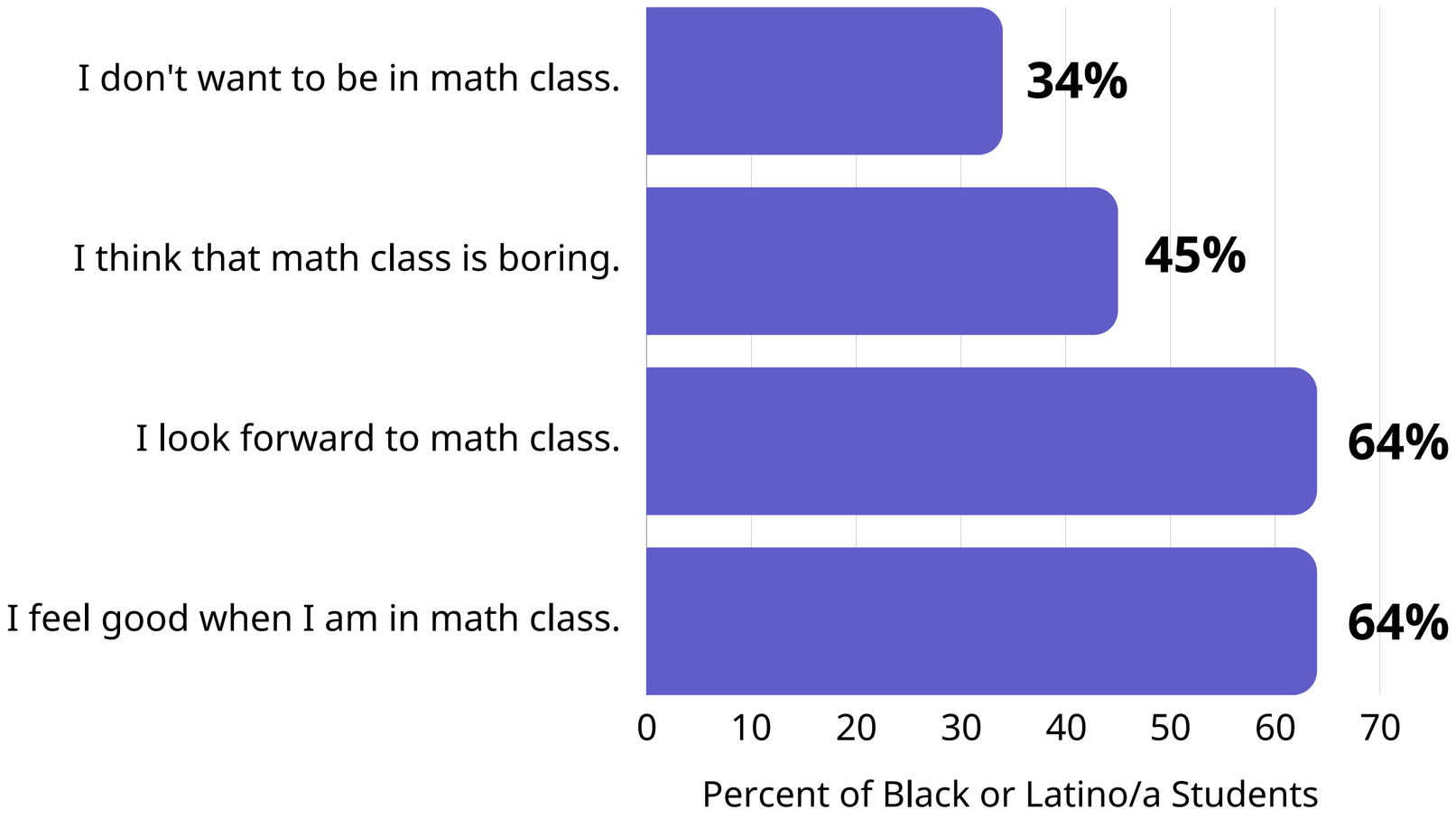
Providing Support

Alternatively, **students shut down and chose to disengage** when they feel like they are not getting the support they need from their math teacher.

“You're like, I feel like I don't want to ask my math teacher too much questions because like **by the second question I ask, she like gets like irritated**.”

- Emily, a Somali female student at Katherine Johnson Middle School

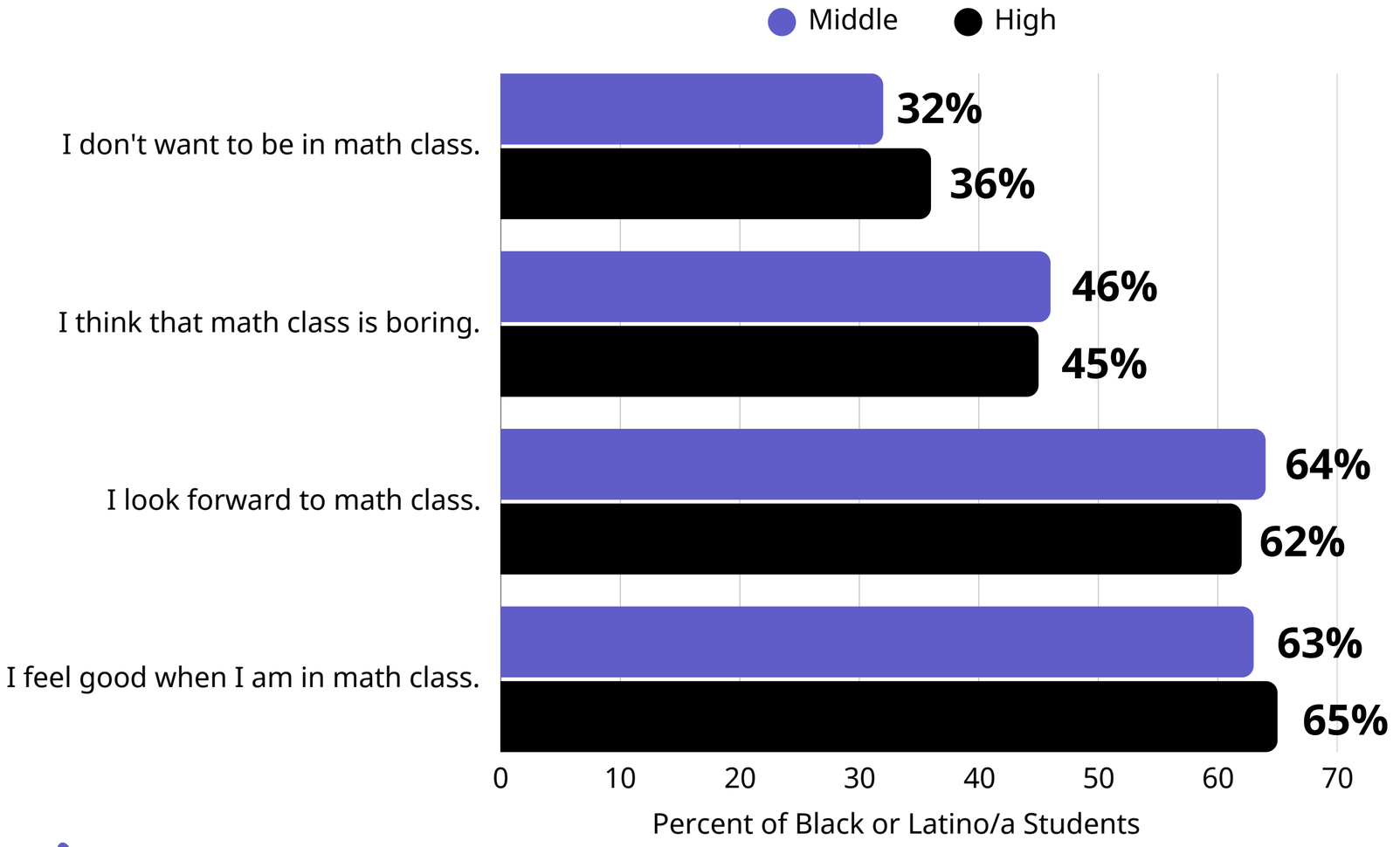
Student-Teacher Relationships



Nearly 2/3 of Black and Latina/o students **feel good when they are in math class** and a similar number of students **look forward to math class**.

Note that these items are not perfectly aligned with theme of student-teacher relationships. More data will be collected in Year 2.

Student-Teacher Relationships



On average, **middle and high school Black and Latina/o students felt similar** positive feelings towards their math classes.

Note that these items are not perfectly aligned with theme of student-teacher relationships. More data will be collected in Year 2.

Actionable Insights

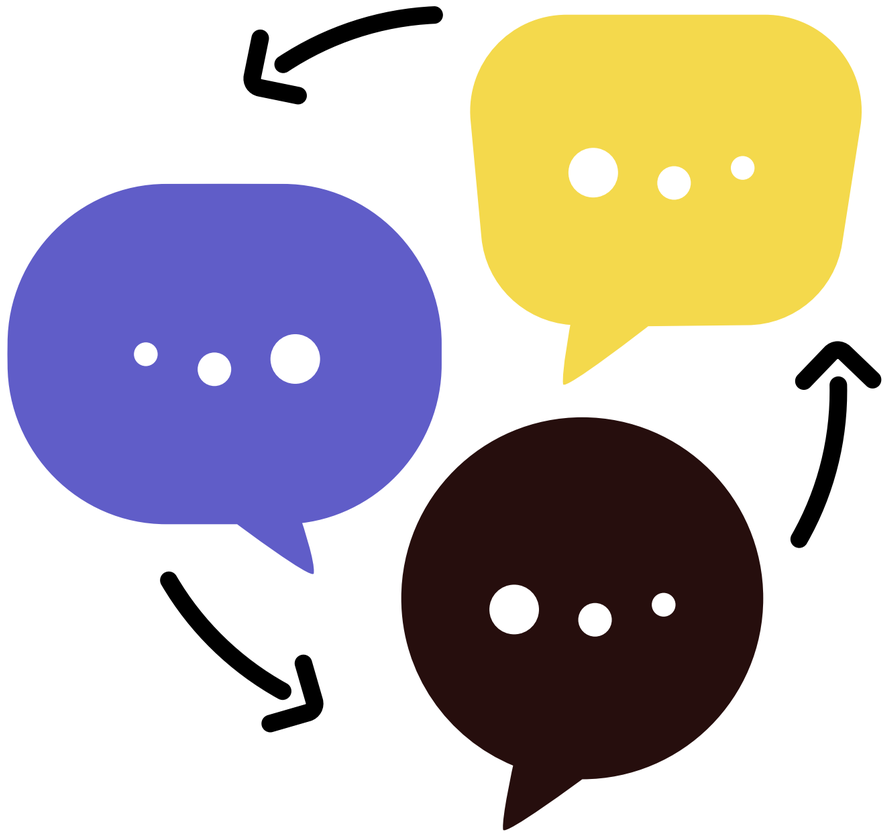
- **Build intentional time** into classes **to get to know students** on a **personal level.**
- Create a **supportive environment** in classrooms by **empowering** students to ask for help and answer questions.
  - Be **consistent**: offer regular opportunities (including “office” hours) to connect and answer student questions.
- Create a **virtual classroom resource library** where students can connect with supports teachers have vetted.

Insights are intended to directly support math teachers in their classrooms.

Small Group Discussion

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?



Working with Peers

Working With Peers

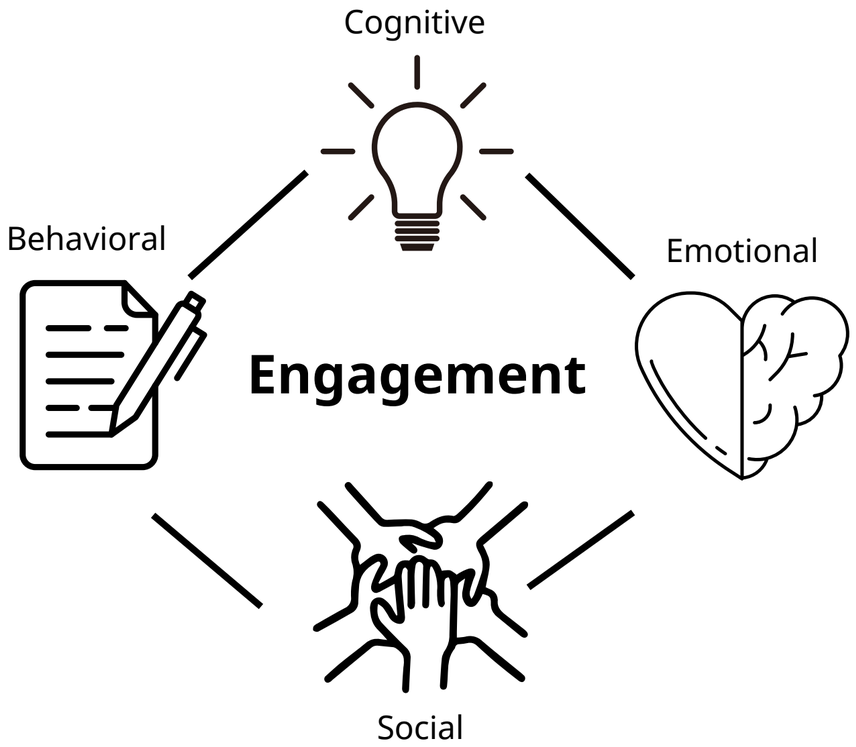
Working with peers explores how students working with their peers, both in and out of the classroom, either support or hinder math engagement through actions like assisting with homework, offering encouragement, emphasizing education's value, and potential peer pressure.

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

Working with peers was mentioned in all 8 of the teacher interviews and all 9 of the student focus groups.

Working With Peers

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



"I would say **I'm usually a friend that's always helping people** since I enjoy math--doing math." – *Jamal, an African American male student at Walter Lincoln Hawkins High School*

Working With Peers

Highlighting the positive aspect of working with peers, students and teachers discussed instances where **students explained math problems to each other or collaborated on problem-solving**, which helped to promote students' math engagement.

"Sometimes I also feel like, like kids understand it better when it's coming from their friends. **Sometimes their friends can explain it better than the teacher can at times**."

– London, an African American female student at Helen Rodríguez Trías High School

Working With Peers

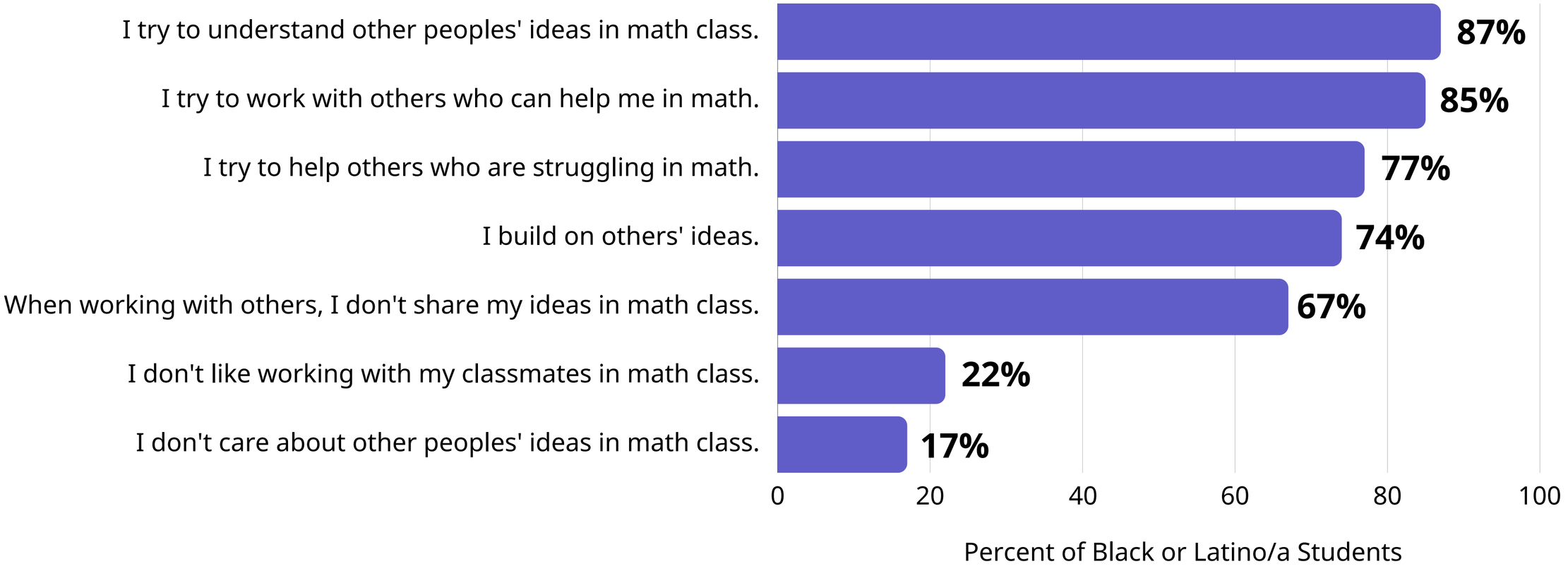
On the negative side, some students pointed out that **working with peers or friends negatively affected their math engagement**, particularly when peers became a **source of distraction**.

[How do friends help you engage in math or not?]
“They don't. They have like bad grades. They don't know anything about math. But then, like, if I’m, if I wanna do my work, I can, like, stay focused and I can, like-- I would completely cut them off and I won't talk to them. And then, I would like, stay to do my work for that. After I finish and, like, get everything done, uh, like, talk to them and, um, stuff like that.”

– Abe, a Black/African American male student at Alexa Canady Middle School

Working With Peers

What social engagement looks like in classrooms typically includes the following, ranked in order of how much Black and Latino/a students agree with them.



Actionable Insights

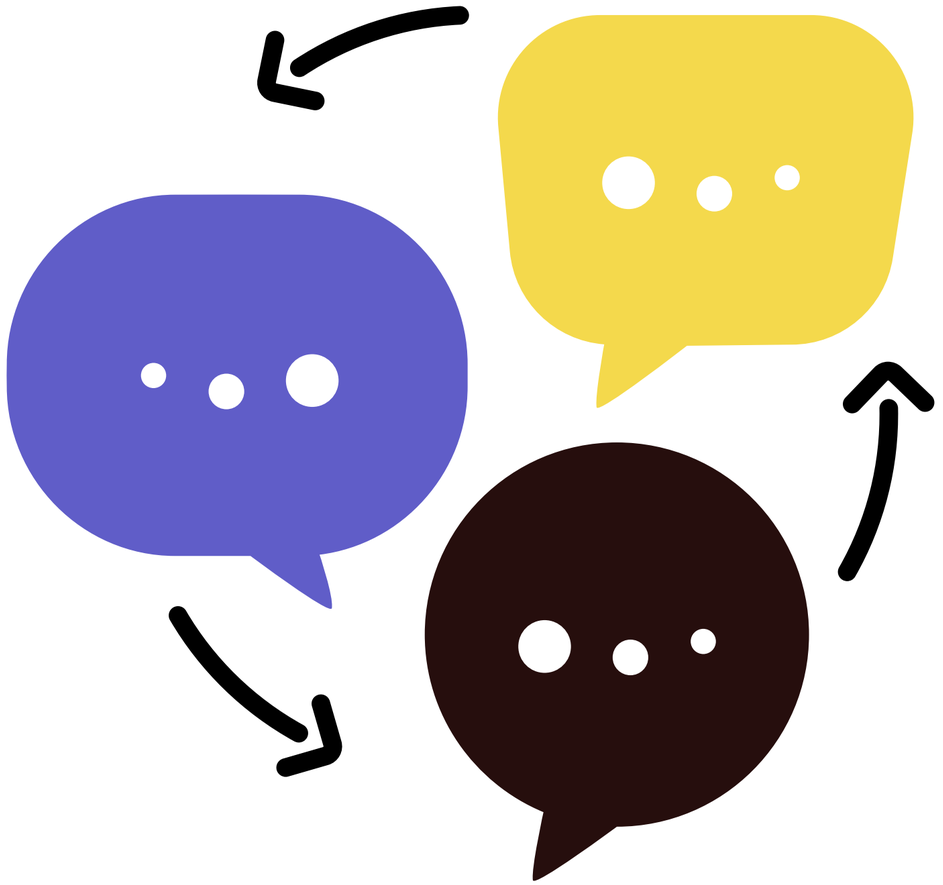
- **Acknowledge students for helping or supporting others in math**; a simple word of encouragement can go a long way. For example:
  - *"I see that you took the time to help Mark with this problem—that's amazing; keep up the good work!"*
- Navigating peer relationships can be tricky, especially during adolescence. **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 across classrooms (for example, an assignment that spans math and science).

Insights are intended to directly support math teachers in their classrooms.

Small Group Discussion

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

How can you leverage them to foster students' math engagement (for example, seating arrangements)?



Family and Community Supports

Family and Community Supports

The third most frequently 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**, including parents/guardians, caregivers, grandparents, siblings, cousins, and community supports.

Family and community supports was mentioned in all 8 of the teacher interviews and all 9 of the student focus groups.

Family and Community Supports

We view these family and community supports as **assets,** as opposed to deficits.

For example, **family expectation for students to be successful could be a motivating factor that supports math engagement**.

Family and Community Supports

“I feel like **I'm more engaged because of the expectations, like, my friends and, like, family hold for me.** And that's, like, always on my mind like, ‘Stay focused. Stay focused. Stay focused. Don't slack. Don't slack. Don't slack.’"

– Jacxs, a Black male student at Walter Lincoln Hawkins High School

“Engage me **to be better as a person and to make me and my family proud**...I also try because my family didn't graduate, like, my parents. So me knowing math, I could help them. So that's what makes me, like, be focused on math.”

– Jess, a Hispanic female student at Walter Lincoln Hawkins High School

Family and Community Supports

- Family and community support, although salient for Black and Latina/o students' math engagement, has been **historically understudied in math engagement research**.

- In fact, the most commonly used measure of math engagement does not include any items on family or community support.

- As a result, **we've added questions about family and community support to the next round of data collection** so Bloomington math teachers can make data-driven decisions in understanding and supporting Black and Latina/o students' math engagement. Stay tuned!

Family and Community Supports

Bloomington also has several **resources that leverage Black and Latina/o students' family and community assets to support their math engagement:**

Cultural-specific student clubs and safe spaces

Language Support

Cultural Liaisons

"Whether it's the Black Student Union or the Spanish Club...**I think there's a social component to [students] being connected with each other**."

– Pythagoras, a math teacher at Helen Rodríguez Trías High School

Family and Community Supports

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Language Support

Cultural Liaisons

"I try to contact home as much as I can...And not even when it comes to bad behaviors, just like, 'Oh, so and so is sleeping today. Just wanted to check in and see if there's anything I could do.' Or like, 'Oh, hey, so and so, aced this whatever, I just wanted to let you know.' **I feel like a lot of parents aren't getting those phone calls, especially Latino families that have that language barrier. Same with Somali or Vietnamese families.** And so that's definitely something that I strive to work with the families on."

- *Meg, a math teacher at César Milstein Middle School*

Family and Community Supports

Bloomington also has several **resources that leverage Black and Latina/o students' family and community assets to support their math engagement:**

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Language Support

Cultural Liaisons

"They are paraprofessionals that we can lean on that were at the high school...We did have a Latinx liaison, a Black liaison, and a Somali liaison. So we had access to quite a few different demographics that we could reach to for assistance. So that was really helpful. But they weren't math teachers. They didn't have necessarily a math background."

– Shark, a math teacher at Alexa Canady Middle School

Actionable Insights

- **Connect with families about their students' math engagement and support them in helping their students.** Support can look like helping with homework, it can also look like words of encouragement, or it can look like providing resources.
  - **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 ways to engage families in culturally relevant ways and using their primary language.
  - **Address barriers to parental involvement** by implementing measures at the school or district level, such as language interpretation services, community events, and accessible materials.

Insights are intended to directly support math teachers in their classrooms.

Actionable Insights

- **Brainstorm with students to identify ways that math is already an important part of their communities.**
  - 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 (for example, cousins, siblings, cultural expectations and norms).
  - Use **culturally relevant math examples** that connect what you teach in your classroom to students' lived experiences.
  - **Actively intervene when you hear** people (even students themselves) say **stereotypes** that are harmful to your students' math engagement (for example, "people like me can never do math").

Insights are intended to directly support math teachers in their classrooms.

Small Group Discussion

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?

Understanding Math Concepts

Understanding Math Concepts

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

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

Understanding math concepts was mentioned in 7 out of 8 teacher interviews and all 9 of the student focus groups.

Understanding Math Concepts

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

“Knowing that I'm right made me focus more or, like, thinking that I'm always right makes me focus more. **So that's when I’m engaged.”**

-Salmi, an African American female student at Walter Lincoln Hawkins High School

Understanding Math Concepts

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

“I really struggle with math and then, like, whenever, like, somebody's helping me with math, like, **I can't, like, really think straight because, like, I get too nervous.**”

- Jess, a Hispanic female student at Walter Lincoln Hawkins High School

Understanding Math Concepts

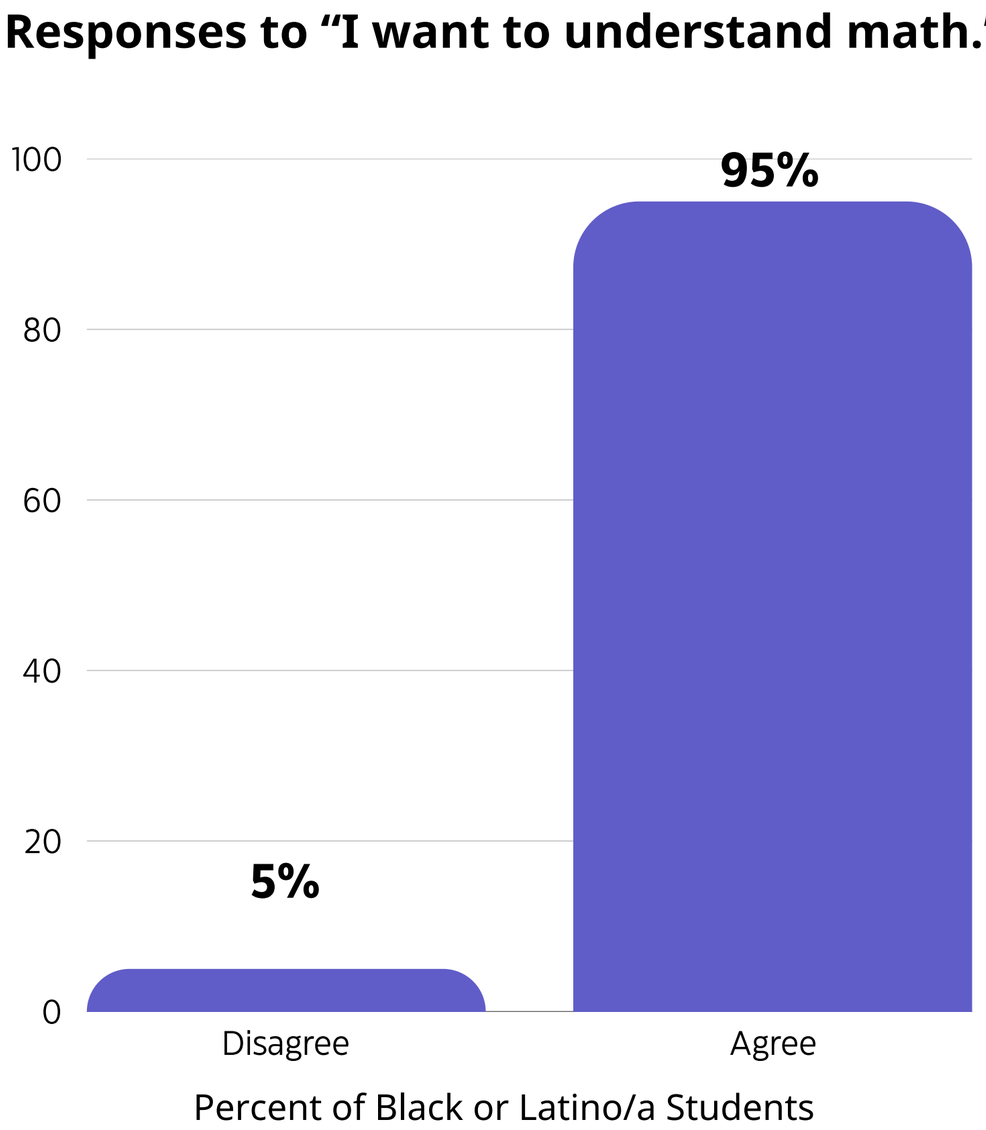
Teachers and students mentioned several factors that made understanding math challenging:

- Learning new concepts **too quickly**.
- **Learning loss** from COVID-19.
- **Math's sequential nature** makes it challenging to catch up once foundational content is missed.
- Too much **homework.**
- **Stigma about making mistakes** and what others will think of them.

"I had a lot of students where they used to just be able to get by on their talent or their knowledge and then suddenly we started doing some things where **they don't have the background knowledge to help them anymore.** And still, same thing, where **they don't know how to study or how to take notes.** And so then that became a challenge for them to be able to show mastery in class because they just haven't learned how to."

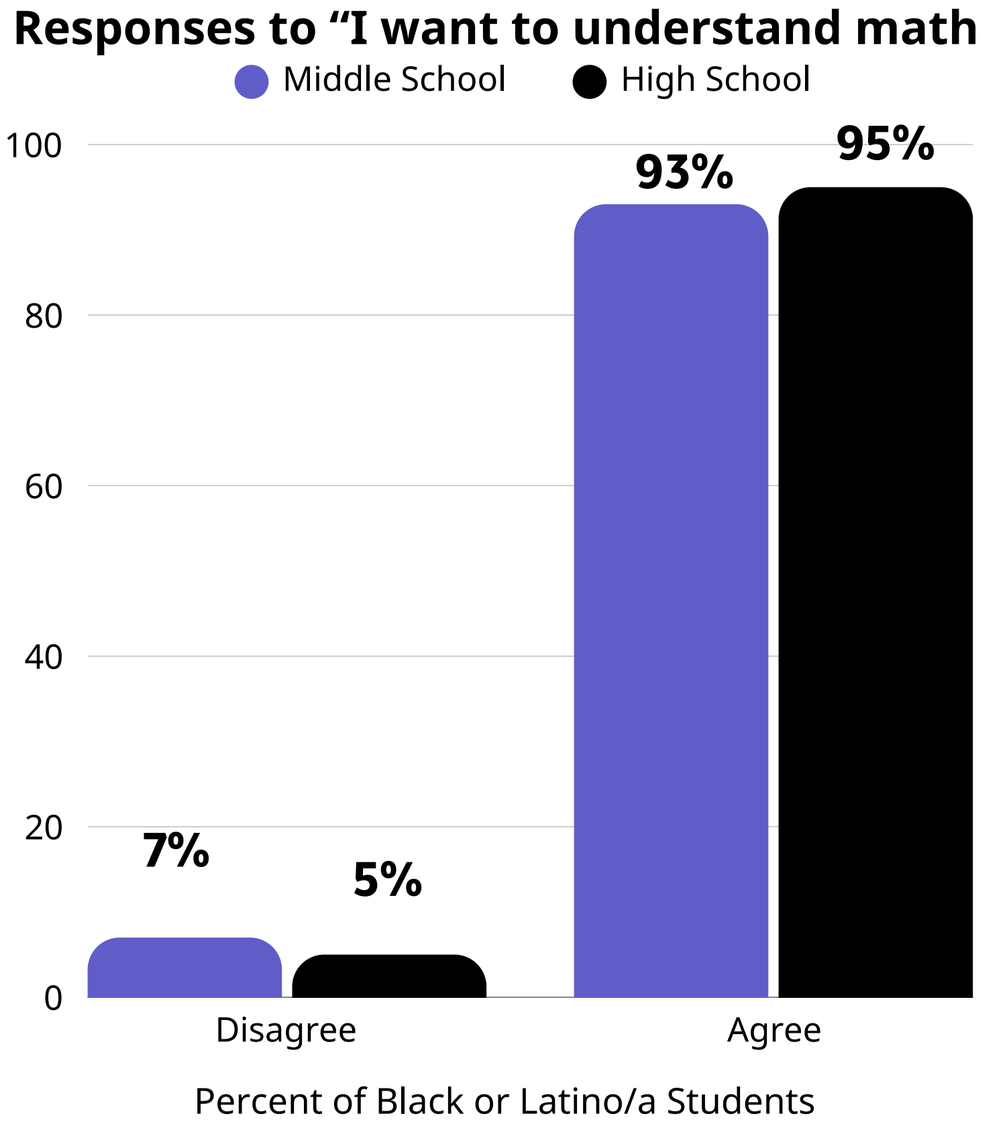
- Eric, a teacher at Walter Lincoln Hawkins High School

Understanding Math Concepts



95% of Black and Latina/o students agree **they <u>want</u> to understand math.**

Understanding Math Concepts



High school students are **more likely to agree** that they want to understand math than middle school students.

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.
  - During these checks, assess students' understanding and well-being, including any signs of stress.
- Additionally, **offer opportunities for 1:1 or small group sessions** outside of class time for students who may need extra support in understanding the content.

Insights are intended to directly support math teachers in their classrooms.

Actionable Insights

- **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.
    - This also helps nurture your students' **growth mindset** by encouraging them to make mistakes and learn from them.

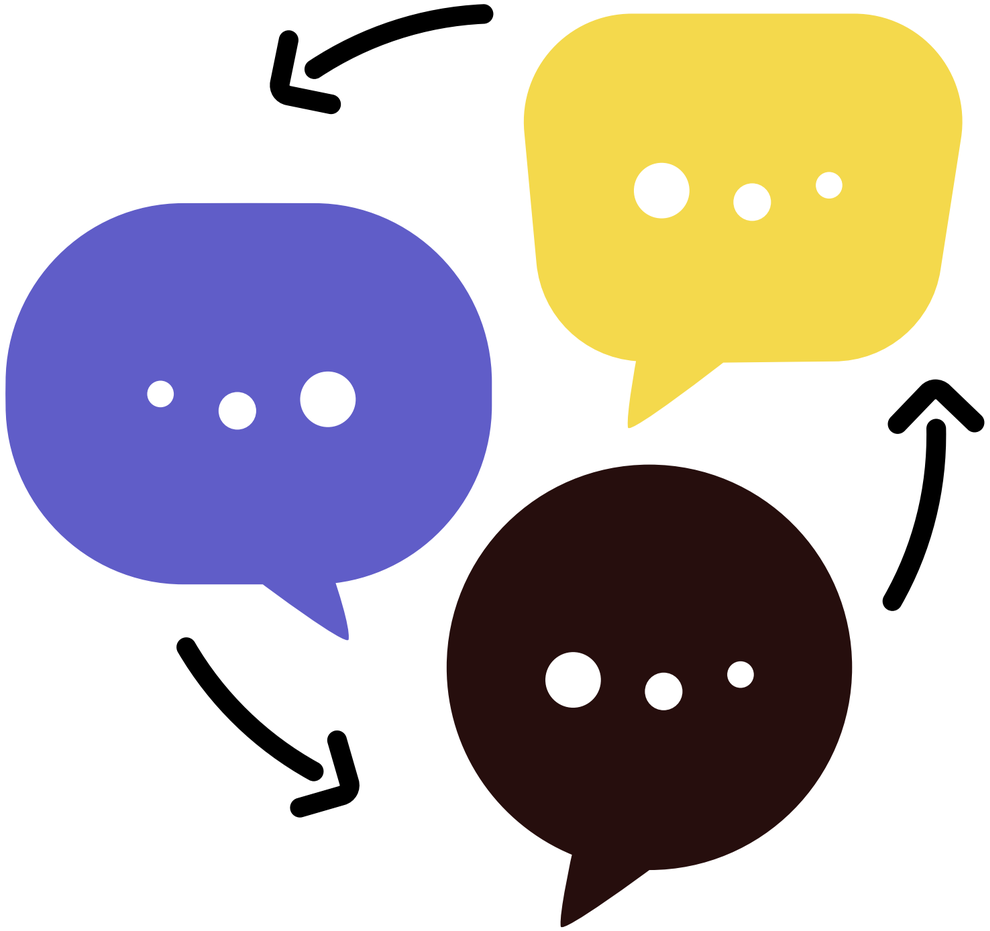
Insights are intended to directly support math teachers in their classrooms.

Small Group Discussion

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?



Feeling Motivated to Do Math

Feeling Motivated to Do Math

The fifth most discussed topic highlights how **math motivation** and engagement go hand in hand.

When discussing feeling motivated to do math, Black and Latina/o students and teachers most commonly talked about **expectations** and **how math related to their future.**

Feeling motivated to do math was mentioned in 2 out of 8 teacher interviews and 7 out of 9 student focus groups.

Expectations + Motivation

"When my, my mom sometimes checks my grades. **Sometimes, if I fail on a test, she's like encourages me to do better and, like, do more homework.** That way, you can get that grade up, and then probably get a reward after."

- Hector, a Hispanic male student at César Milstein Middle School

Students shared how expectations affected their feeling motivated to do math.

Expectations were primarily external rather than self-imposed.

Expectations were set by teachers, classmates, or family.

Expectations had positive and negative impacts on motivation.

The Future + Motivation

“More so it's just, like, like, yeah, getting it done so I can get my grade up in there, so it can help me, like, with **getting into colleges and stuff like that**.”

- London, an African American female student at Helen Rodríguez Trías High School

A key part of math motivation, which researchers call *math utility*, pertains to how useful or relevant math is. Some ways that students described this included:

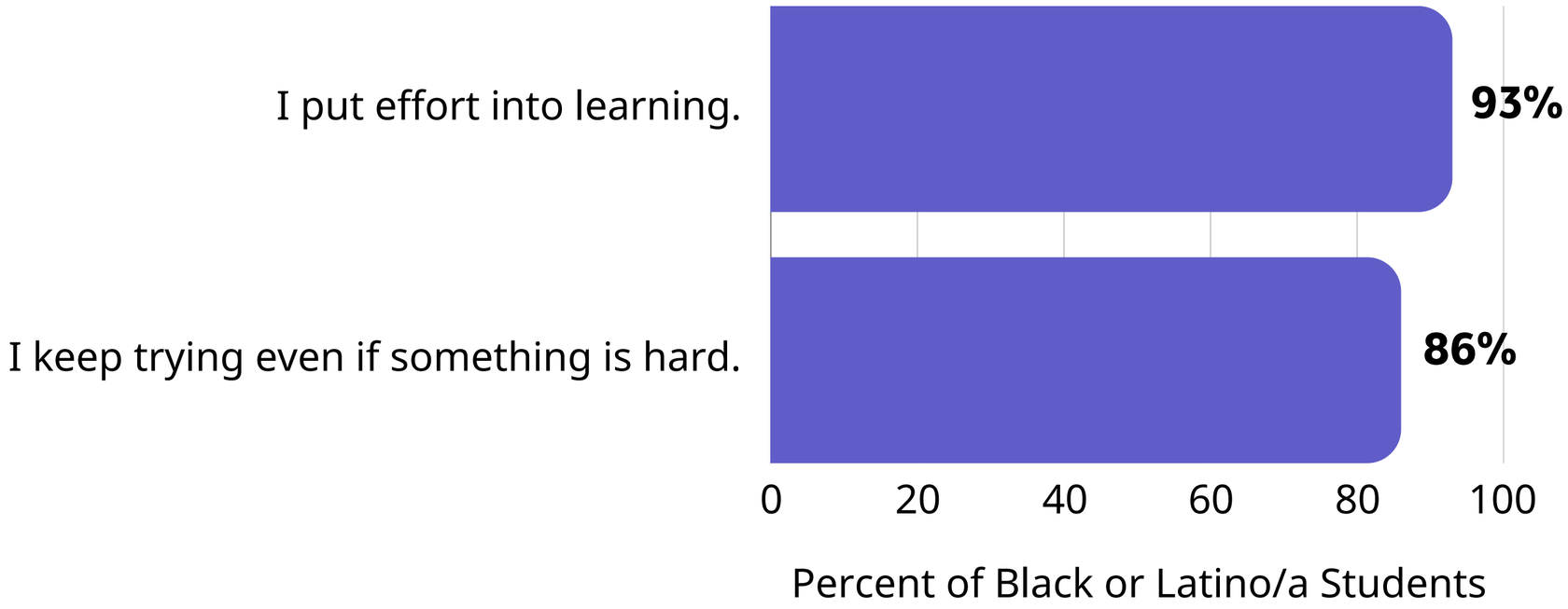
The importance of good math grades for getting into college

Their future career

Wanting to have or be good with money

Feeling Motivated

93% of Black and Latina/o students say that **they put effort into learning**, and **86%** say that **they keep trying even when something is hard.**



Actionable Insights

- **Collaborate with students to establish classroom expectations and norms regarding learning and engagement.** Establishing classroom expectations and norms is most effective at the beginning of the year but should be revisited periodically.
  - 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.

Insights are intended to directly support math teachers in their classrooms.

Actionable Insights

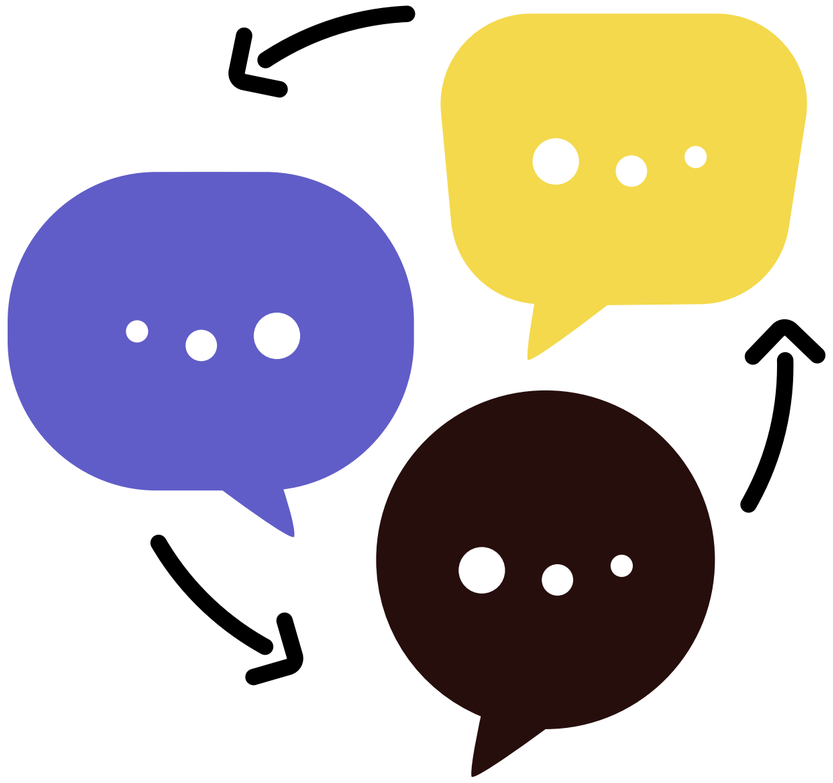
- Leverage **easy wins** in your classroom to boost student confidence and motivation in math.
  - For instance, start each class with a manageable refresher problem that students can collectively tackle.
- **Provide in-class time for students to complete work** and provide space to ask questions and check their understanding.
- **Collaborate with students to generate ideas for rewards** or other motivators that can enhance their engagement in lessons.

Insights are intended to directly support math teachers in their classrooms.

Small Group Discussion

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?

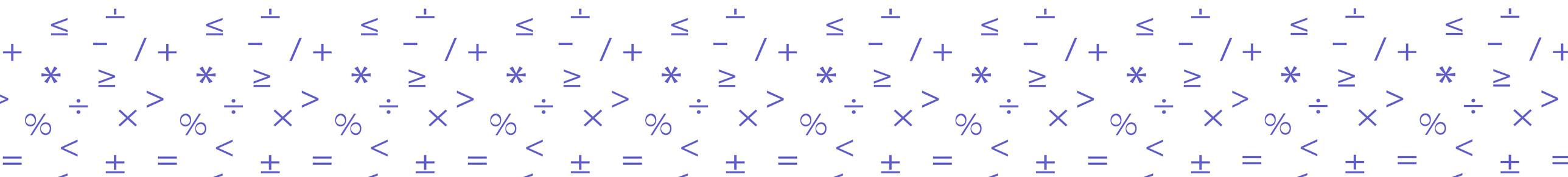


Wrap Up and Next Steps

Wrap Up & Next Steps

The project continues and we have some exciting next steps ahead:

- **February 5-16**: Window for the *new* (more holistic) survey of math engagement.
- **April**: Student focus groups to further understand math engagement based on survey results.
- **Fall 2024:** Share findings from Year 2 data collection.



Feedback for Us

Please complete this four question survey to provide us feedback on how we can improve.

https://shorturl.at/eCFZ6

Wrap Up & Next Steps

Do you want more information? We have created the following materials as resources for this work:

- Companion Guide
- Community resource
- Survey topline

Questions? Feel free to contact your school's AM-ME student or teacher representative or Samantha Holquist at **sholquist@childtrends.org**.

What to stay up to date? Sign up for our newsletter: **https://forms.office.com/r/qZFUwh7kVh**

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

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