Introduction to Data!
Drop-in Meetings

Adapted Measure of Math Engagement Research Group,
July 17, 20 or 21, 2023

Child Trends
Search Institute
Bloomington Public Schools
McREL International
National Science Foundation

Check in

Since our last group meeting…

- What is one thing that you learned during our last meeting?
- What is one thing that you kept thinking about?
- What questions came up?

Agenda

- **What we cover today will prepare us for the July 24 & 25 meeting!**

Today

- Look at of the **qualitative (word) data** on middle and high school student math engagement.
- Look at the **quantitative (number) data** on middle and high school student math engagement.
- Questions & discussion

July 24 & 25

- Team Building
- Identify themes of math engagement
- Merge new themes with the existing survey

Reminder! How did we collect data?

Qualitative Data Collection		Quantitative Data Collection
Interviews	**Focus Groups**	**Surveys**
• 1:1 conversation • In-depth responses • Many questions • Private – easier to ask about sensitive or controversial topics • Data analysis is more time consuming	• Ideally 4 to 8 participants • Responses not necessarily in-depth • Fewer questions • Not private – can build community around shared experiences • Data analysis is more time consuming	• No limit on number of participants • Questions generally less in-depth • Many questions • Private • Takes less time to analyze data

Qualitative Data

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How did we collect data?

Who did we talk to? How did we talk to them? What did we ask?

How did we analyze data?

What did the process look like? What key definitions do you need to know?

What did we find?

Most common themes, least common themes, differences between middle and high school students, differences between students and teachers

How did we collect data?

Who did we talk to? How did we talk to them?

Interviews	Focus Groups

• **8 math teachers**
  ◦ 4 in middle school, 4 in high school
  ◦ 7 identify as White, 1 as Non-White
  ◦ 5 identify as female, 3 as male
  ◦ 7 have been teaching 10 or more years, 1 less than 10 years
• Lasted between **25 and 45 minutes** .
• Took place online afterschool in May and June 2023.
• Participants each received a $50 gift card for their time.
	• **50 students** total (between 4 and 7 students per focus group in 9 focus groups)
	  ◦ 68% in middle school, 32% in high school
	  ◦ 48% identify as female, 52% as male
	  ◦ 66% like math, 14% are indifferent, 20% don't like math
	• Lasted between **45 and 90 minutes** .
	• Took place in middle and high schools directly after school in May 2023.
	• Participants each received a $50 gift card for their time.

What did we ask?

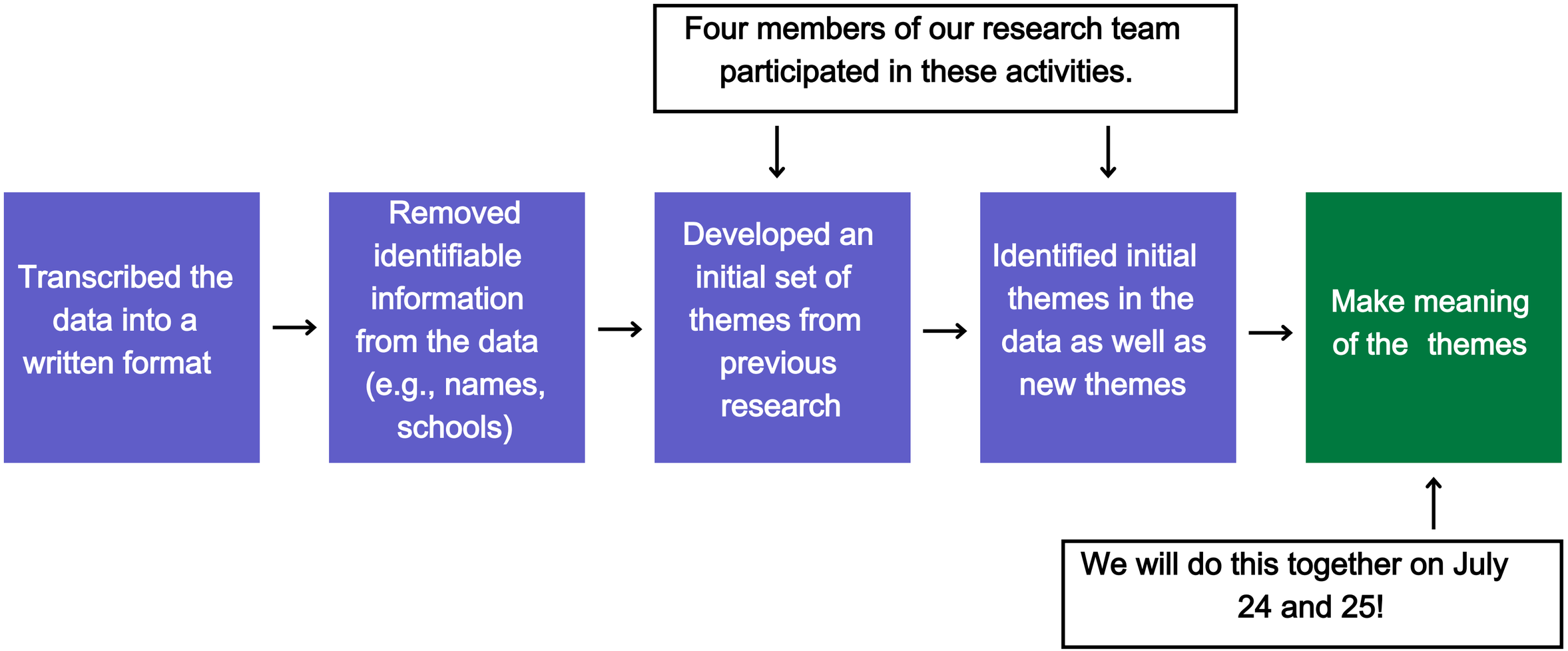
- Our questions focused on understanding **how students and teachers describe math engagement and what engagement looks like to them** .

- At the end of our first meeting together, we gave you a sense of the types of questions we asked the teachers and students.

- Here are examples of the questions we asked:
  - **If I say, “math people,” can you describe who comes to mind?**
  - **Tell me about your math classrooms.** What are teachers like? Do you feel challenged? Do you participate in math class? Do you feel supported?
  - **Tell me about a time you were engaged in math.** What did it look like when you were engaged? What did it feel like? Who helped you engage in math?
  - **What are barriers to your engagement in math?** What makes you not engaged in math? What do you feel when you are not engaged in math?

How did we analyze data?

What did the process look like?



Key definitions you need to know!

- **What are themes?**
  - Themes are the common perceptions, experiences, feelings, values, beliefs, and/or ideas stated by participants.
    - For example, if students discussed how math class is boring during a focus group, we may capture that entire section of the conversation as a theme entitled "feeling bored."
  - Themes are meant us help to explain the data.
  - Themes enable us to summarize a lot of words into one word or short phrases.
  - We may also sometimes refer to themes as "codes."

- **What does it mean to "make meaning" of qualitative data?**
  - Making meaning of qualitative data means that we are interpreting the themes identified to understand a common experience or phenomenon.
  - For example, in this project, we will be interpreting the themes identified to capture how Black and Latina/o students understand math engagement.

What did we find?

Reminder!

All of these themes are related to **how students and teachers describe math engagement and what engagement looks like to them.**

Most common student themes

1. Negative student-teacher relationships
2. Work with peers or friends
3. Positive student-teacher relationships
4. Understands math

Negative student-teacher relationships

Description of the theme:
Refers to experiences and perceptions of negative interactions between teachers and students within the classroom setting. It includes instances where students faced difficulties, conflicts, perception of favoritism, or negative dynamics with their teachers, impacting their learning and engagement.

"And she would just get frustrated, like-- and then almost, like, yell at the whole class, making it everybody's problem which made a lot of people uncomfortable. And it made me not like math. Like, I come to realize I actually really like math because-- well, it's not really because but it's just, like, it's not, like, the worst thing in the world. **But I think it was the teacher that made it -- made me feel like it wasn't a subject that I was really into .**

- Isabel, a female, Latina, high school student

Most common teacher themes

1. Works with peers or friends
2. Instruction style
3. Differentiated learning strategies

Works with peers or friends

Description of the theme:
Refers to students working with their peers (usually in a classroom context) or friends (either in or out of the classroom).

"The epitome of an engagement, right, especially if we're working with manipulatives would be all students, right, they're leaning in. So, again, if they're in a group, that means then we've got our four desks together and so their bodies are leaning in. Sometimes they're half even on the desk and they're all working then together. So that would be the epitome of that."

- Jasmine, a female, White, middle school teacher

Least common themes overall

1. Feels isolated
2. Feels motivated
3. Listens in class
4. Learns from mistakes

"For me, it was, like, the different environment. Because I was in a middle school, uh, it was a private school. And going into a high school that's a public school, I didn't know anyone. And I felt so alone and I couldn't even meet people. So it felt so different."

- Jess, a female, Hispanic, high school student

Themes mentioned by students , not teachers

1. Feels bored
2. Feels dumb
3. Receives rewards

"I feel, like, antsy just 'cause I learn at a way different in math than a lot of people, and so, like, she'll be, uh, still explaining the problem and I'll just-- I'll already have finished it---and just have to wait for, like, 20 minutes until they're all done and stuff. It's like I could have been doing more, but our teacher won't always allow us to use, like, the time-- the extra time we have to do the rest of our class work."

- Jasmine, a female, Black, middle school student

Themes mentioned by teachers , not students

1

Family obligations

"So the stories that have been shared with me is, I got to take care of a younger sibling. I got to go home and make dinner. Mom and dad or guardian is at work. So those have been the stories that have been shared with me. When I was at the high school, the story was, sorry I can't go. I got to work to kind of be a supplemental income to the family."

- Shark, a female, White, middle school teacher

Themes mentioned more often in middle school than high school *

1. Negative student-teacher relationship
2. Works with peers or friends
3. Completes homework
4. Distracted in class

*Important to remember that there were more middle school student participants than high school.

Themes mentioned more often in high school than middle school *

1. Positive student-teacher relationship
2. School and class schedule
3. Asks questions (or for help)
4. Feels judged
5. Technology resources

*Important to remember that there were more middle school student participants than high school.

Themes mentioned more often in schools with a higher percentage of Black and Latino students

1. Works with peers or friends
2. Positive student-teacher relationships
3. Distracted in class
4. Enjoys math

Quantitative Data

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How did we collect data?

Who did we talk to? How did we talk to them? What did we ask?

How did we analyze data?

What did the process look like?

What did we find?

Questions that students rated themselves highest on. Questions that students rated themselves lowest on.

How did we collect data?

The Survey

- A survey called "The Math and Science Engagement Scales" that is widely used in schools across the United States to measure students' math and science engagement.

- 38 survey questions.
  - You did all of them as the pre-work.
  - Some survey questions are about **math engagement** , some about **math disengagement** .

- Response option: strongly disagree -- disagree -- agree -- strongly agree.

- Takes approximately 5 to 8 minutes to complete.

How was the survey administered?

- It was administered by Bloomington Public School's Research, Evaluation, and Assessment Office via Google Forms in April and May 2023.

- Students were able to take during and outside of school.
  - All middle and high school students in Bloomington Public Schools were invited to take the survey.

- Students who took the survey received a $10 electronic gift card.

Who took the survey?

School	Black students	Latino students	Other students (mostly White)
[Middle School]	49	40	347
[Middle School]	86	61	302
[Middle School]	123	171	148
[High School]	29	20	257
[High School]	90	129	204
Total	**337**	**421**	**1258**

How did we analyze data?

How did we analyze the data?

- For the results in this presentation, **descriptive statistics** were used to analyze the data.
  - Descriptive statistics help us *describe* the data.
    - **Frequency**, which is how often a response is occurring in the data. For example, 337 Black students took the survey.
    - **Percentage**, which looks at the percentage of responses compared to the total number of responses received. For example, 98% of people like math, and 2% of people do not like math. *This is a made up example*.

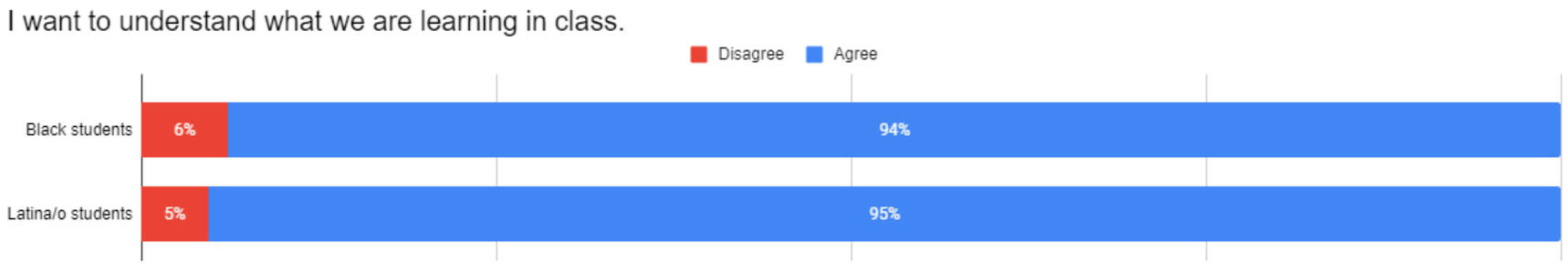
- During the August meeting, we will provide you with more complex analysis of the data.

What did we find?

Reminder!

Responses to questions are intended to help us understand how much **students are engaged or disengaged in math class.**

Survey questions about math **engagement** that students rated highest on.



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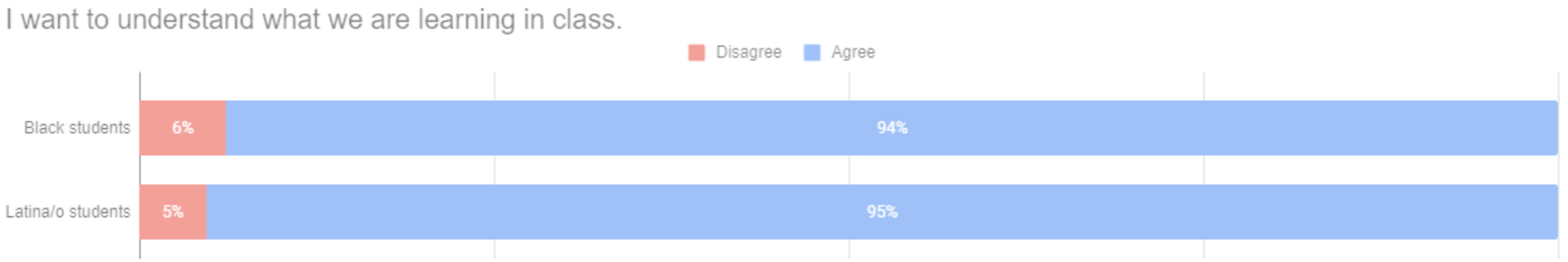

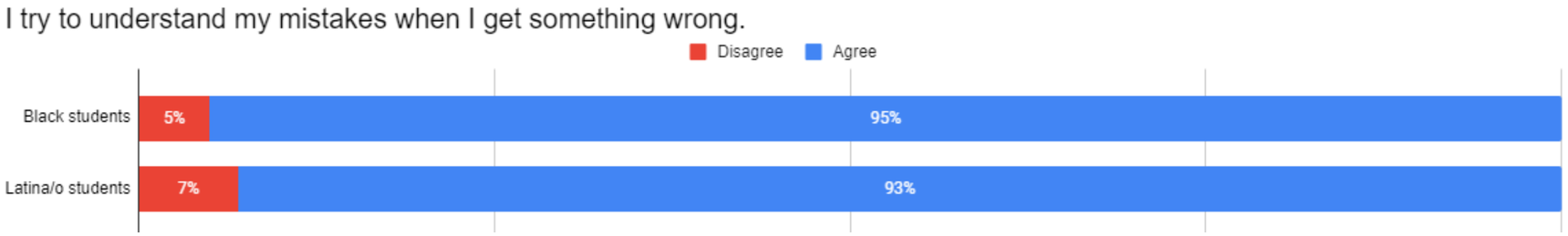

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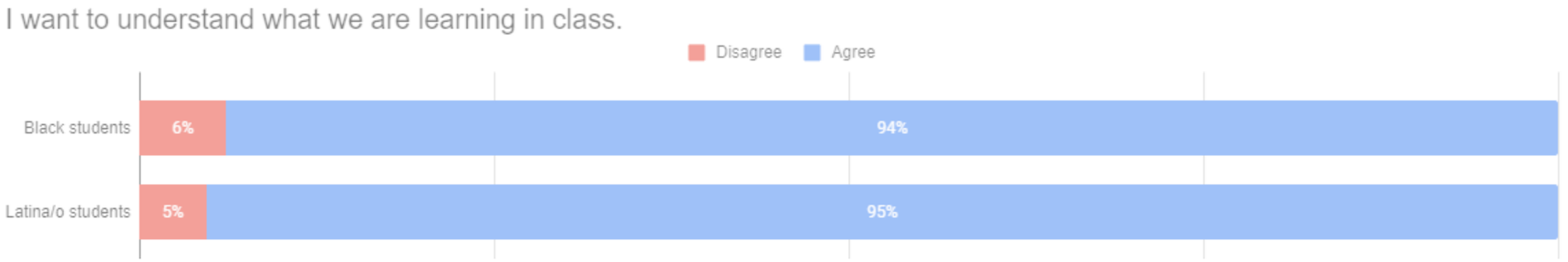
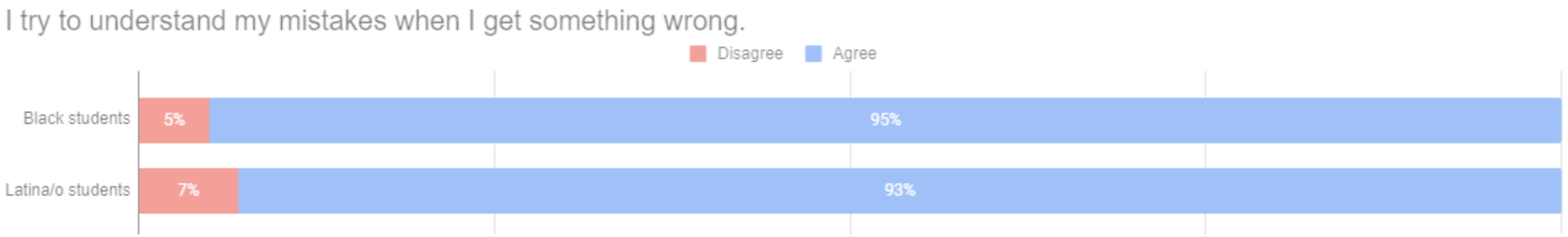
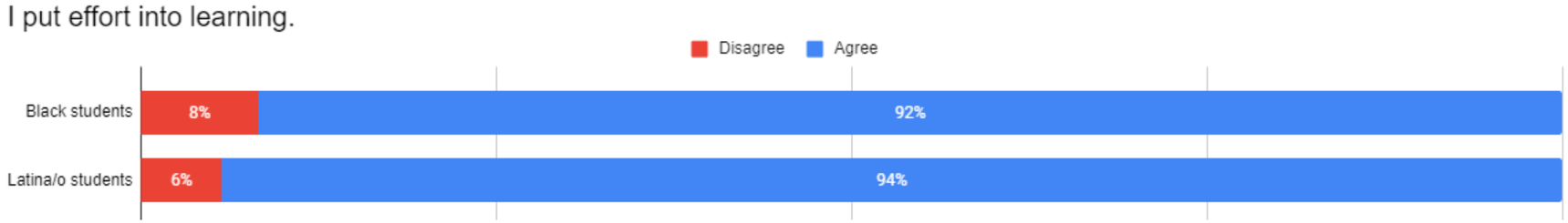
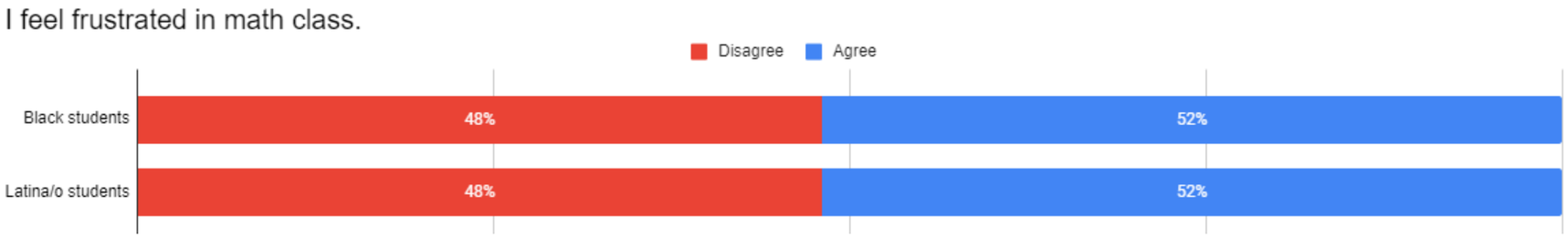






Survey questions about math disengagement that students rated highest on.



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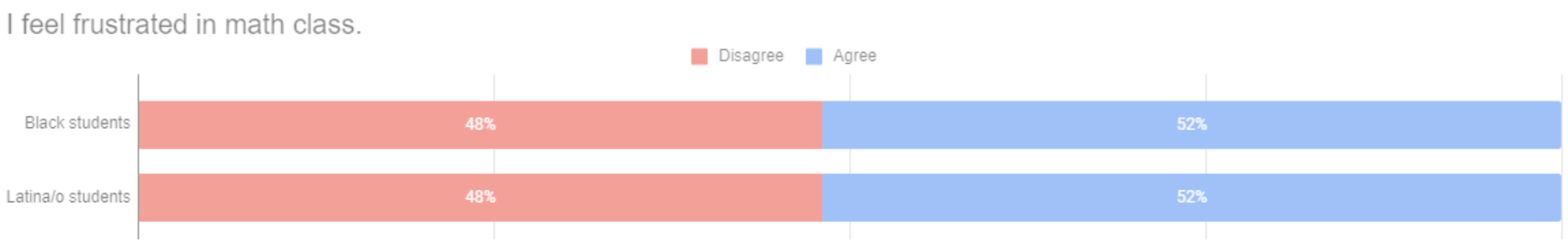

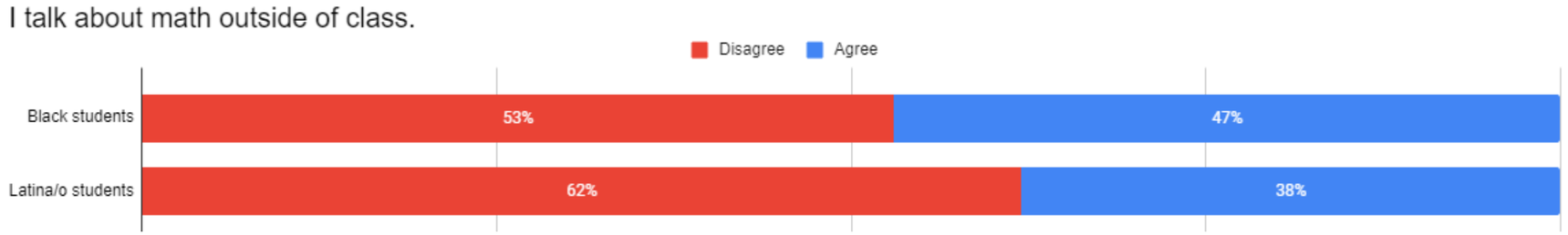

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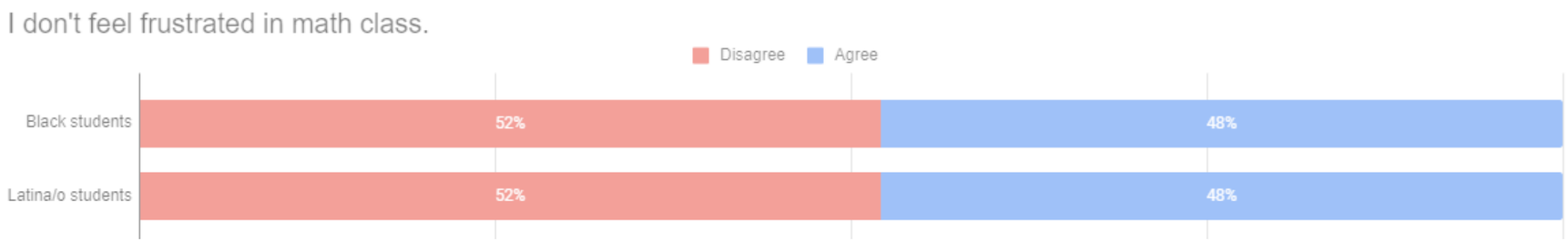
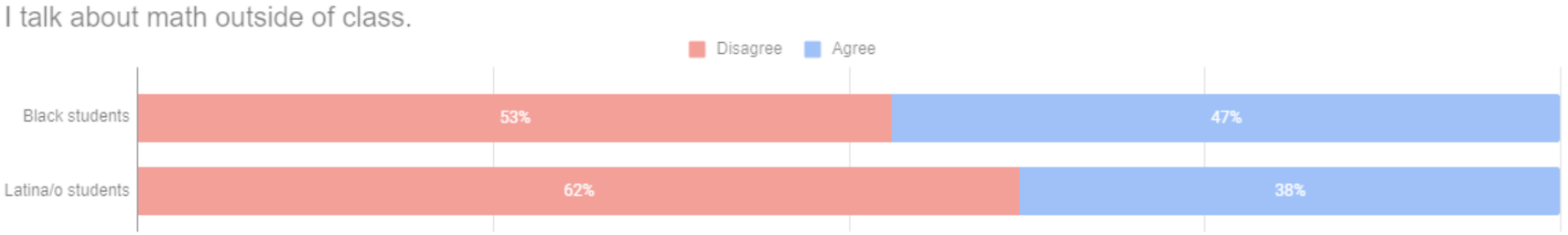
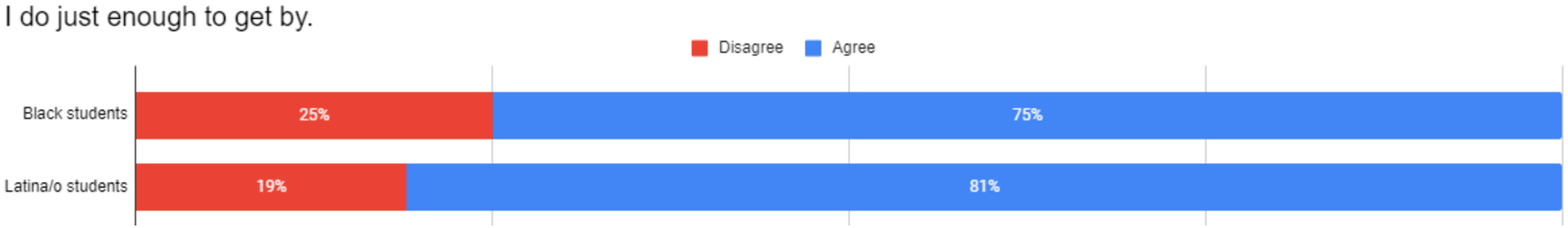
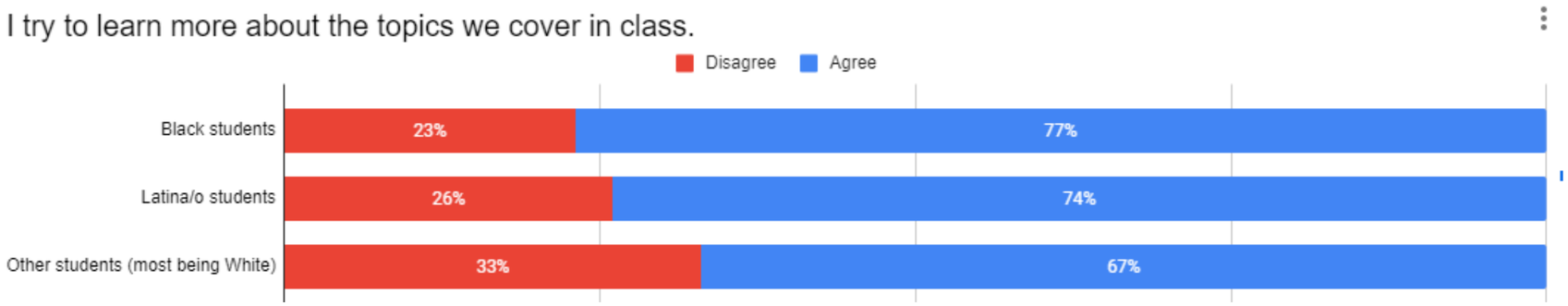






Survey questions about math engagement that students from different racial/ ethnic backgrounds differed most on…



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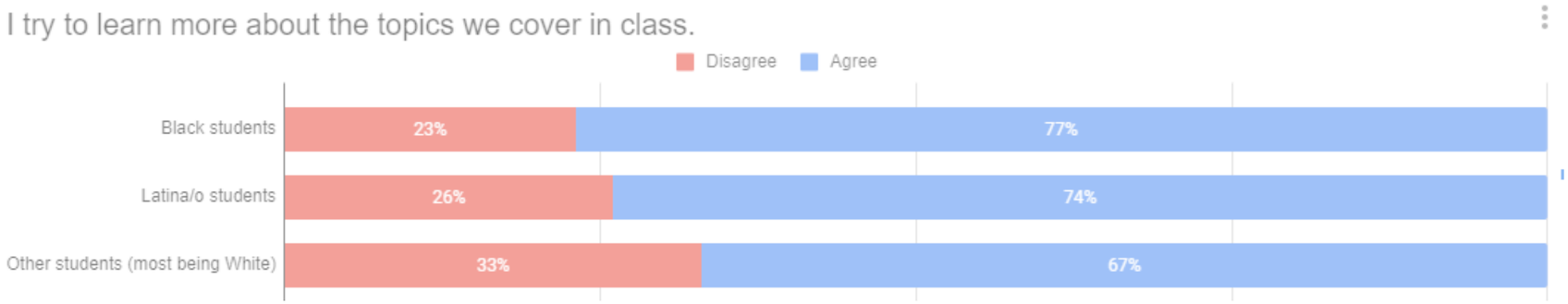

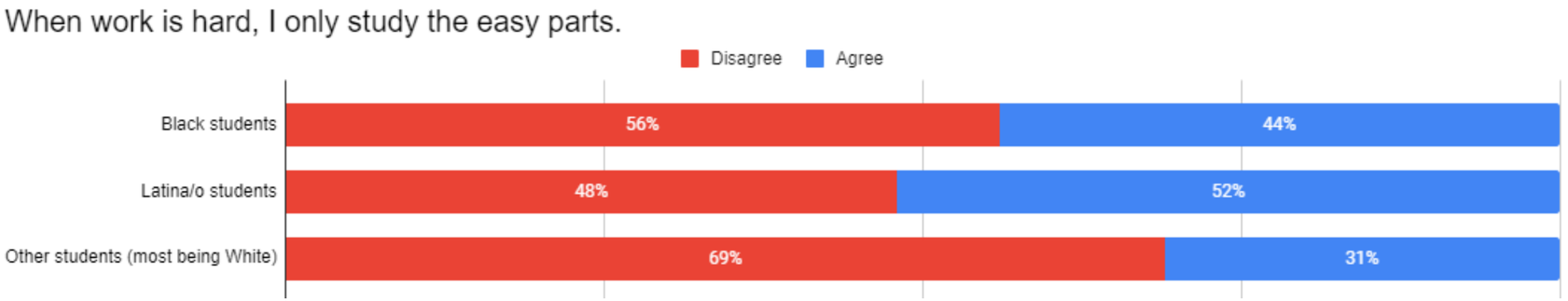

Next steps!

- We will, as a group, make sense of even more results (e.g., like what we did last time...put themes into buckets)
- Then, we'll discuss how the traditional survey can be improved by adding in Bloomington results.

- To get ready for our July 24-25 meeting, what additional information can be helpful?
  - Read some of the quotes before our group meeting?
  - Break the survey results down to be more specific?

Closing

Exit Ticket

Let us know what you liked and what you hope is changed for the next meeting.

Next Meeting *(in person!)*

- July 24 (Monday) 1-4pm, AND July 25 (Tuesday) 1-4pm.
- Link to order food will be included in the reminder email!

Stay Connected

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Learn more about the Adapted Measure of Math Engagement at https://www.childtrends.org/project/adapted-measure-of-math-engagement.