

# (HOW) CAN MATHEMATICS TEACHING DISRUPT WHITE SUPREMACY AND OPPRESSION?

Deborah Loewenberg Ball

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Colloquium in Mathematics Education  
Teachers College, Columbia University • February 1, 2021



SCHOOL OF EDUCATION




TeachingWorks



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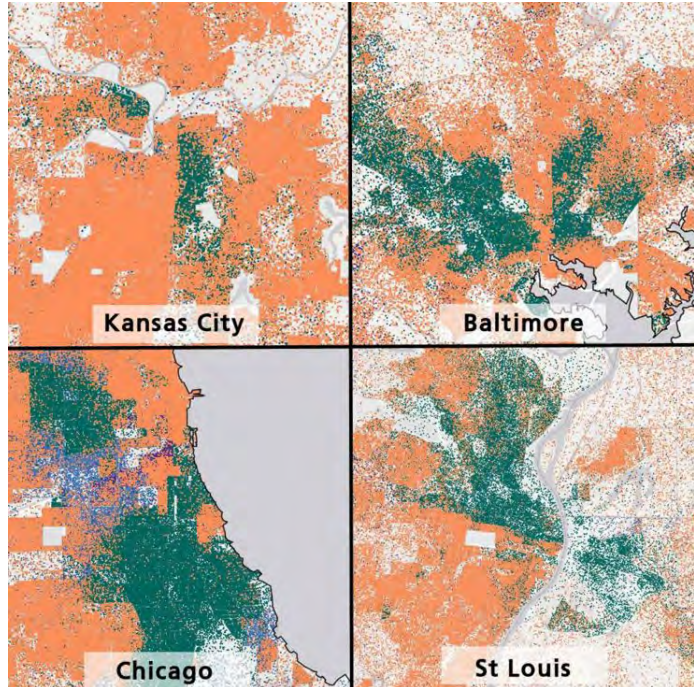


There seems to be an increasingly shared recognition that racism is systemic and rooted in our histories and institutions.



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**OUR CRIMINAL JUSTICE SYSTEM NEEDS REFORM**

Being uninsured is *deadly*.  
 A comprehensive review of studies, published in the Annals of Internal Medicine, confirms that **thousands of people die each year because they don't have coverage**. We need to close these gaps and cover everybody with improved Medicare for all.

**PNHP**  [pnhp.org/mortality](https://pnhp.org/mortality)

But the connections to our everyday practice are often left unclear.

And without making those connections, the patterns are reproduced through normalized practices.



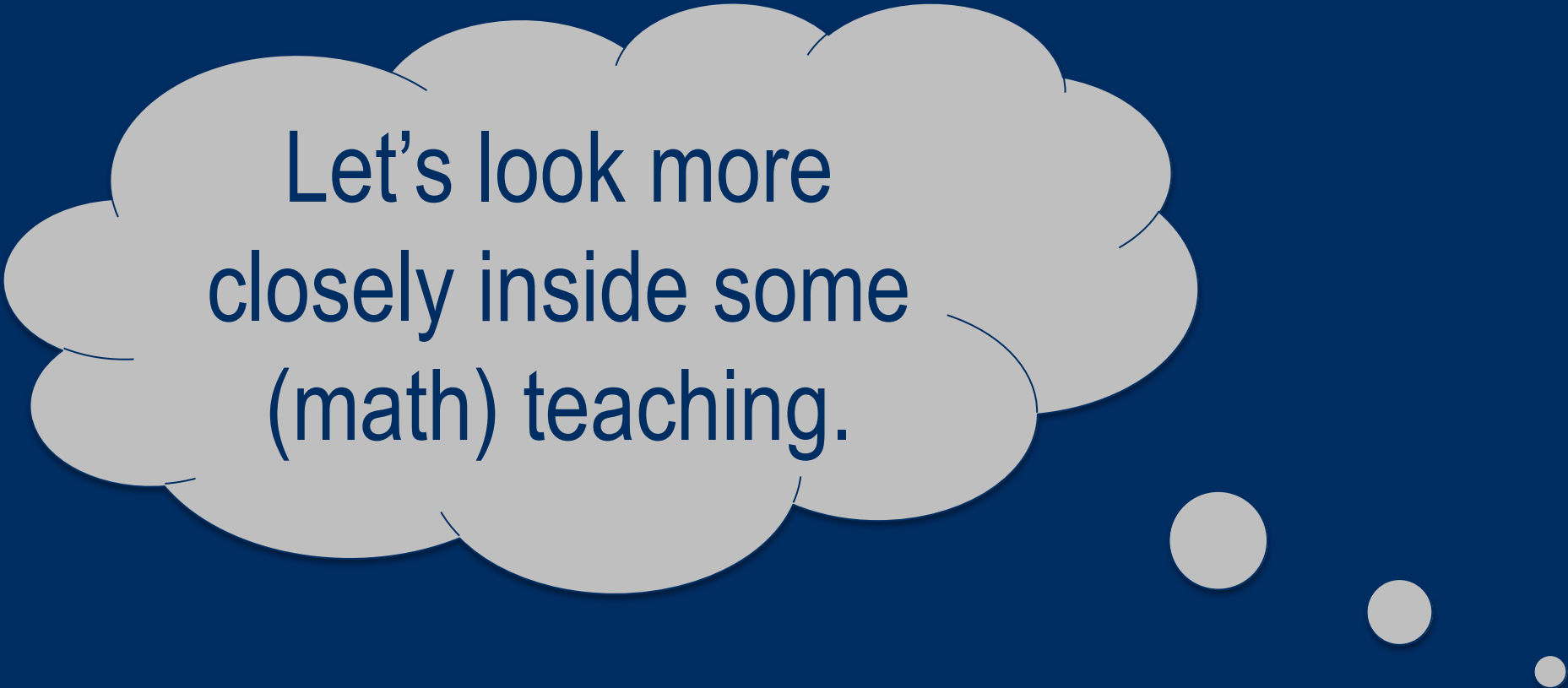
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Let's look more  
closely inside some  
(math) teaching.

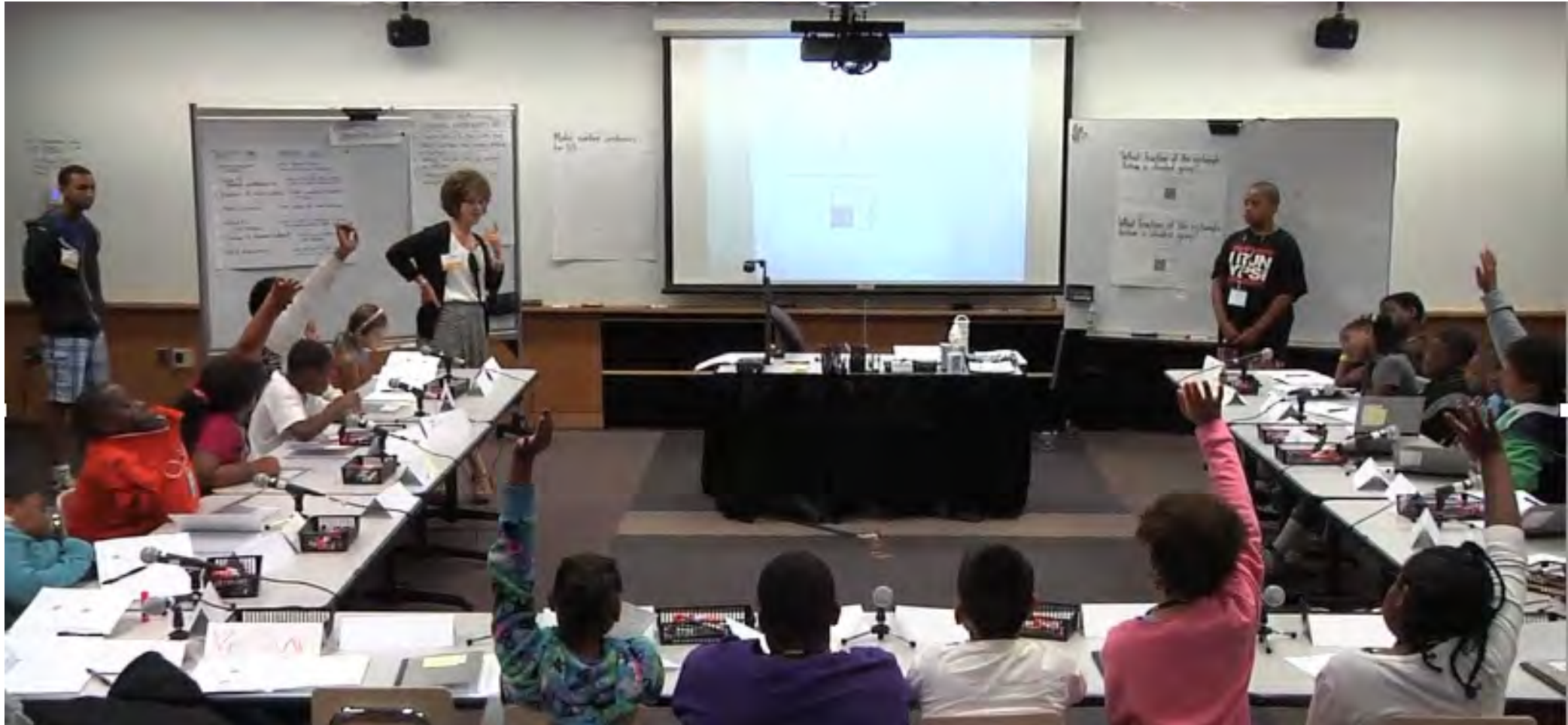


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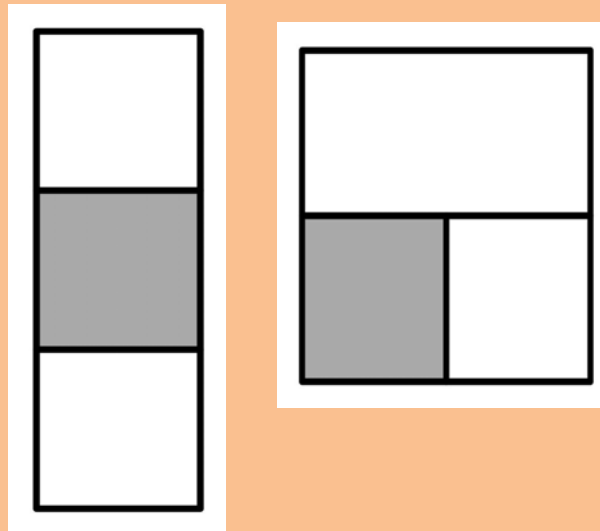
# Teaching intertwines moral, intellectual, political, social, relational, and personal work.



# Let's watch a short segment from a classroom math discussion.

## The mathematics task

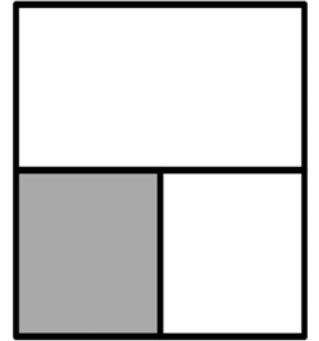
What fraction of each rectangle below is shaded gray?



# What are the challenges of teaching you see?

Consider moral, intellectual, social, relational, political, and personal challenges.

# VIDEO: ANTAR AND GABI



What fraction of the rectangle below is shaded gray?

What fraction of the rectangle below is shaded gray?

Antar: I think it's not a fraction because all of the parts are not equally the same shape.

How is Antar being positioned?

What is the mathematical point of this?

What does Antar mean by "it's not a fraction"?

Should I put another example up or keep working on this figure?

Shall we stay in whole group or turn and talk in smaller groups?

Should Antar stay at the board while Gabi presents?

How shall I try to position Antar and Gabi?

What shall I say or ask next?

Should I explain or keep the children talking together?

Whom shall I call on?

Are those two students over on the side following this discussion?

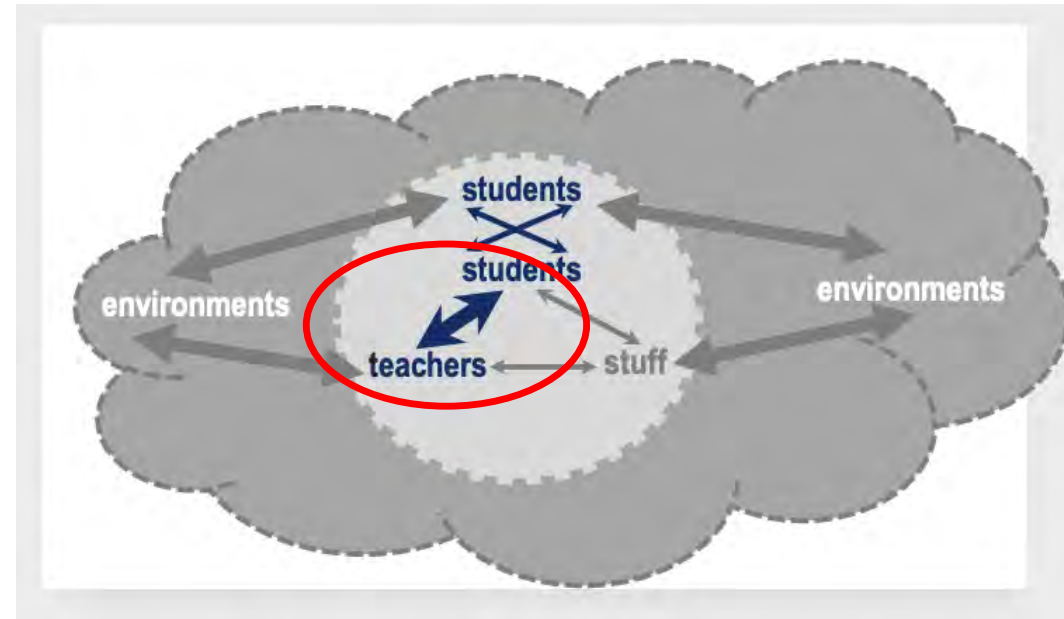
Where shall I stand?

How can I get other students to build on what Antar and Gabi have said?

Is this a good moment to give Gabi the "sticky" line

How is Antar feeling about his contribution?

|           |  |  |
|-----------|--|--|
| Teacher   | Who'd like to answer what you think about the second rectangle? We're only going to be able to talk about this briefly. We probably won't finish it. | Launch discussion                                    |
| Teacher   | Who'd like to explain what you think? Antar, what do you think?  | Choose student to call on                            |
| Teacher   | Could you come up to the board and explain? Thank you.   | Frame task for student who is presenting             |
| Teacher   | I really like the way that people who are coming to the board are doing today. You are explaining really well.                                       | Acknowledge competence                               |
| Teacher   | Here's a marker. Can you explain your thinking?  | Provide material support                             |
| Antar     | I think it's not a fraction because all of the parts are not equally the same shape.   | Listen   |
| Teacher   | Can you say that one more time to the class?   | Support presenter                                    |
| Antar     | I think it's not a fraction because all the parts are not equally the same.  | Listen   |
| Teacher   | Can someone repeat what Antar said? Very nice, Antar.  | Orient students to presenter                         |
|           | <i>Many students have their hands up</i>   |  |
| Teacher   | What did he say? Gabriella?  | Choose student to call on                            |
| Gabriella | Oh. He said that he doesn't think it's a fraction because not all the parts are equal.   | Listen   |
| Teacher   | Is that what you said?   | Position first student as authority                  |
| Teacher   | Okay, would someone like to comment on that? Agree or disagree with him?   | Orient students to one another                       |
| Teacher   | Okay, let's see, how about Gabi.   | Choose student to call on                            |
| Gabi      | I disagree.  | Listen   |
| Teacher   | What do you think?   | Pose question  |
| Gabi      | I think the fraction is one-fourth.  | Listen   |
| Teacher   | One-fourth? Do you want to come up and say why you think it's one fourth?  | Frame next step, support next presenter              |
| Teacher   | Antar, do you want to stay there or do you want to sit down? Okay. Thank you very much. You did a good job of explaining your thinking.              | Position student with agency, acknowledge competence |
| Teacher   | So, let's hear what Gabi's thinking.   | Orient students to one another                       |
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| Teacher   | Here's something you can use so if someone wants to take it off again, they can. Okay, so now explain what you've done. Talk to the class, okay?     | Provide material support                             |
| Gabi      | I divided it down the middle because, since it's not equal, you have to make it equal.   | Listen   |
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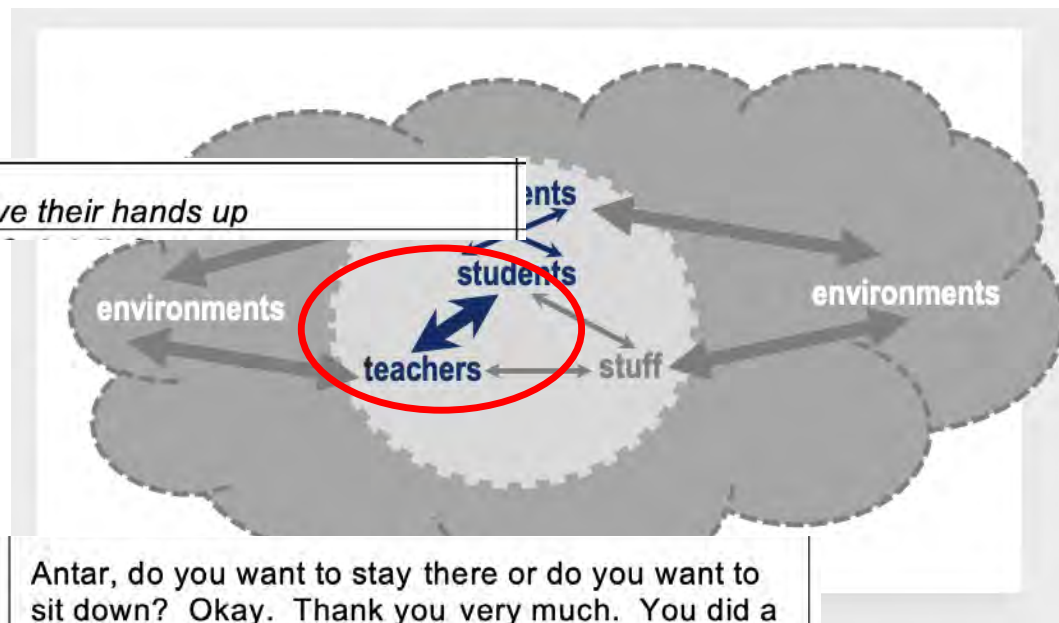


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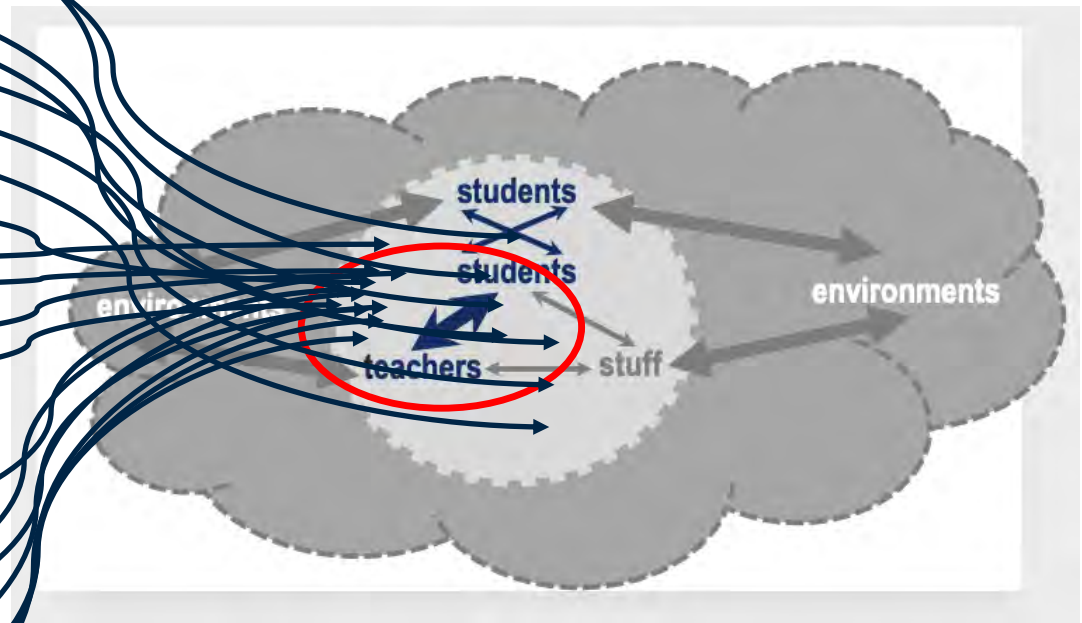
*Many students have their hands up*



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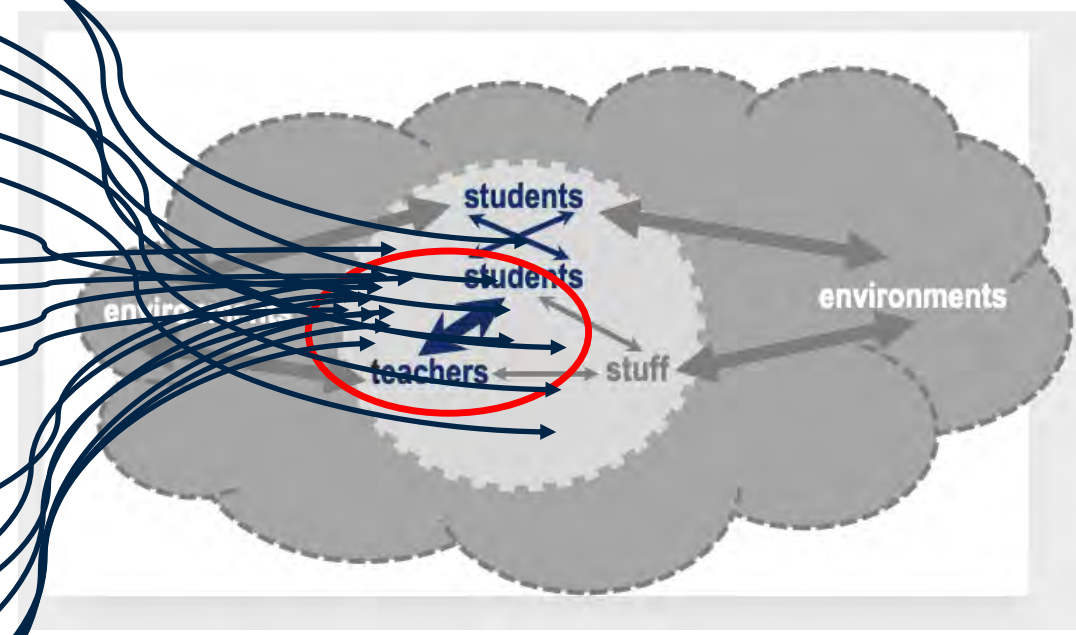


25 in 2:21



# TEACHING IS DENSE WITH “DISCRETIONARY SPACES”

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25 in 2:21

1. Teaching is powerful. When it is done with care and judgment, students can thrive — learn mathematics, develop positive identities, learn to value others and work collectively.
2. Teaching also involves enormous discretion.
3. How that discretion is exercised can either reinforce patterns of social, personal, and epistemic injustice and harm, or disrupt these patterns.

# THE UNIQUE POTENTIAL OF MATHEMATICS TO PERPETUATE—OR DISRUPT—INJUSTICE

- The history of “mathematics” as white, male, heteronormative, western
- The melding of “intelligence” and mathematics (and the history of “intelligence”)
- Narrow constructions of “mathematics” that uphold these
- The rich resources of mathematics in many communities and cultures
- The power afforded by seeing oneself as “smart” or “good at math”
- The imaginative creative space possible in mathematics, for invention, experimentation, construction, representation, and performance
- The assets of collective work in mathematics

What would it take to harness the power of mathematics teaching to disrupt white supremacy and oppression?



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leveraging the many discretionary spaces of teaching



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What would it take to harness the power of mathematics teaching to disrupt white supremacy and oppression?

and knowing mathematics in ways that support that work

leveraging the many discretionary spaces of teaching



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# ANIYAH AND TONI



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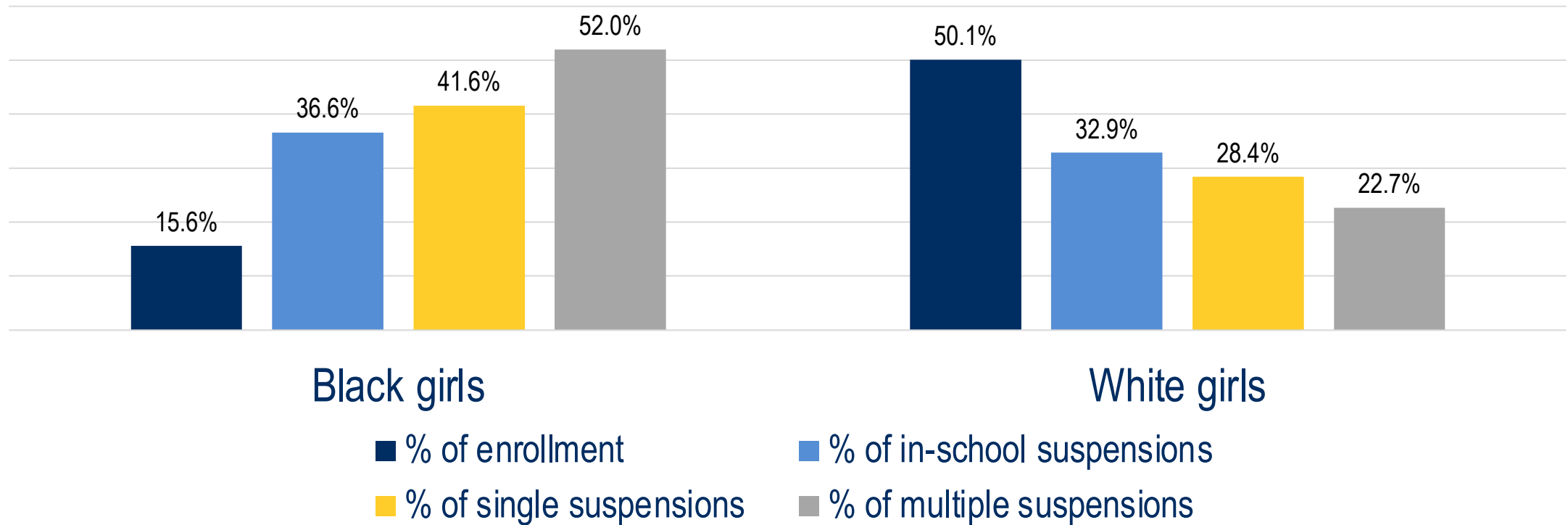


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# SYSTEMIC PATTERN #1

## THE DISPROPORTIONATE PUNISHMENT OF BLACK GIRLS



Epstein, Blake, & González (2017)



# SYSTEMIC PATTERN #2

## DISPROPORTIONALITY IN ASSIGNMENT TO “ABILITY STATUS”

- Black students: 16.7% of student population; 9.8% of those selected to gifted programs
- Latin@ students 22.3% of student population; 15.4% of those selected to gifted programs
- 6.2% of all students are assigned to gifted programs; 10% of Asian students, 7.5% of White; 3.6% of Latin@; 3% of Black
- Black students are 2x as likely to be classified as having learning or emotional problems (special ed)
- Exclusion from class reduces opportunity to learn
- Exclusion from rigorous content; long-term effects of labeling
- Lack of access to accelerated and enrichment programs

1. [Teacher's race affects gifted program selections](#), Joan Brasher, Research News @ Vanderbilt , January 18, 2016
2. Grissom, J. & Redding, C. (2016). Discretion and disproportionality: Explaining the underrepresentation of high-achieving students of color in gifted programs. *AERA Open*, 2(1), 1–25.



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What number does the orange arrow point to?  
Explain how you figured it out.



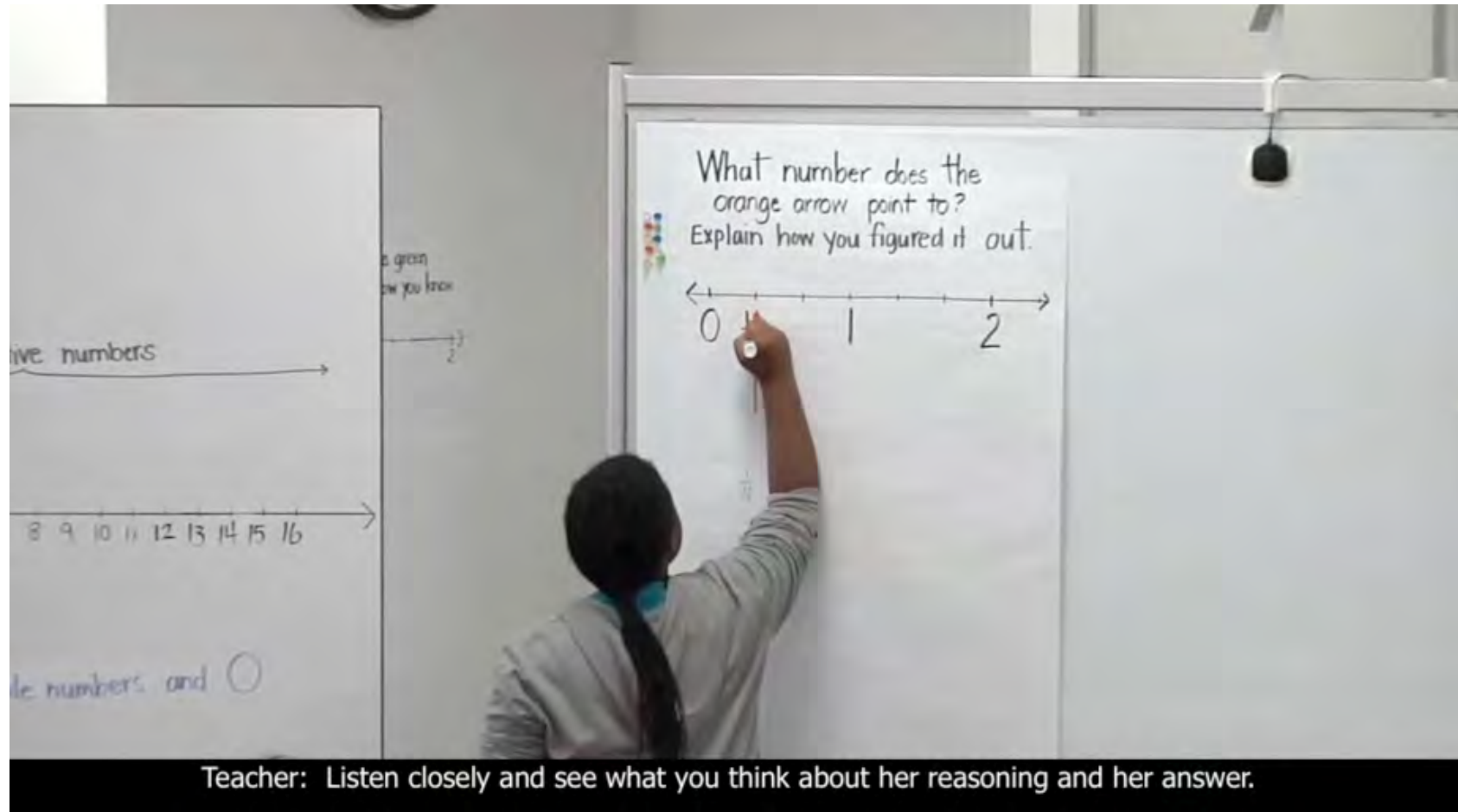
# ANIYAH AND TONI



# VIEWING FOCUS

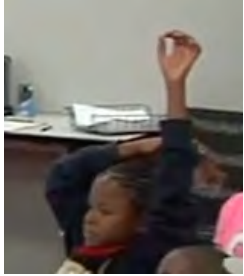
What do you think are the most frequent comments that educators make about Toni? About Aniyah?

# VIDEO: ANIYAH AND TONI



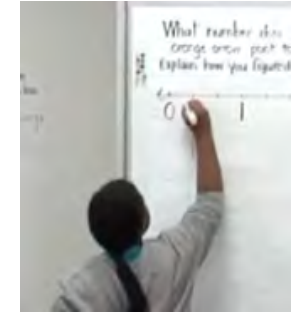
This video and additional supporting materials are available online [here](#).

# WHAT ARE THE MOST FREQUENT COMMENTS?



**TONI**

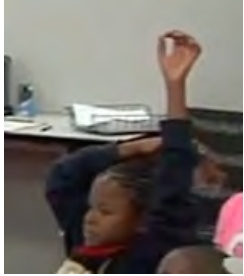
- Toni is fooling around with another student across the room and laughing at Aniyah.
- Toni is being disrespectful to Aniyah.
- Toni knows that Aniyah is wrong and is trying to point that out.



**ANIYAH**

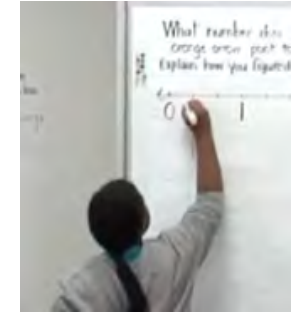
- Aniyah has the wrong answer.
- Aniyah should not be left up there with a wrong answer, feeling bad and possibly confusing other children.
- Aniyah is being harmed by how Toni is treating her.

# WHAT ARE THE MOST FREQUENT COMMENTS?



TONI

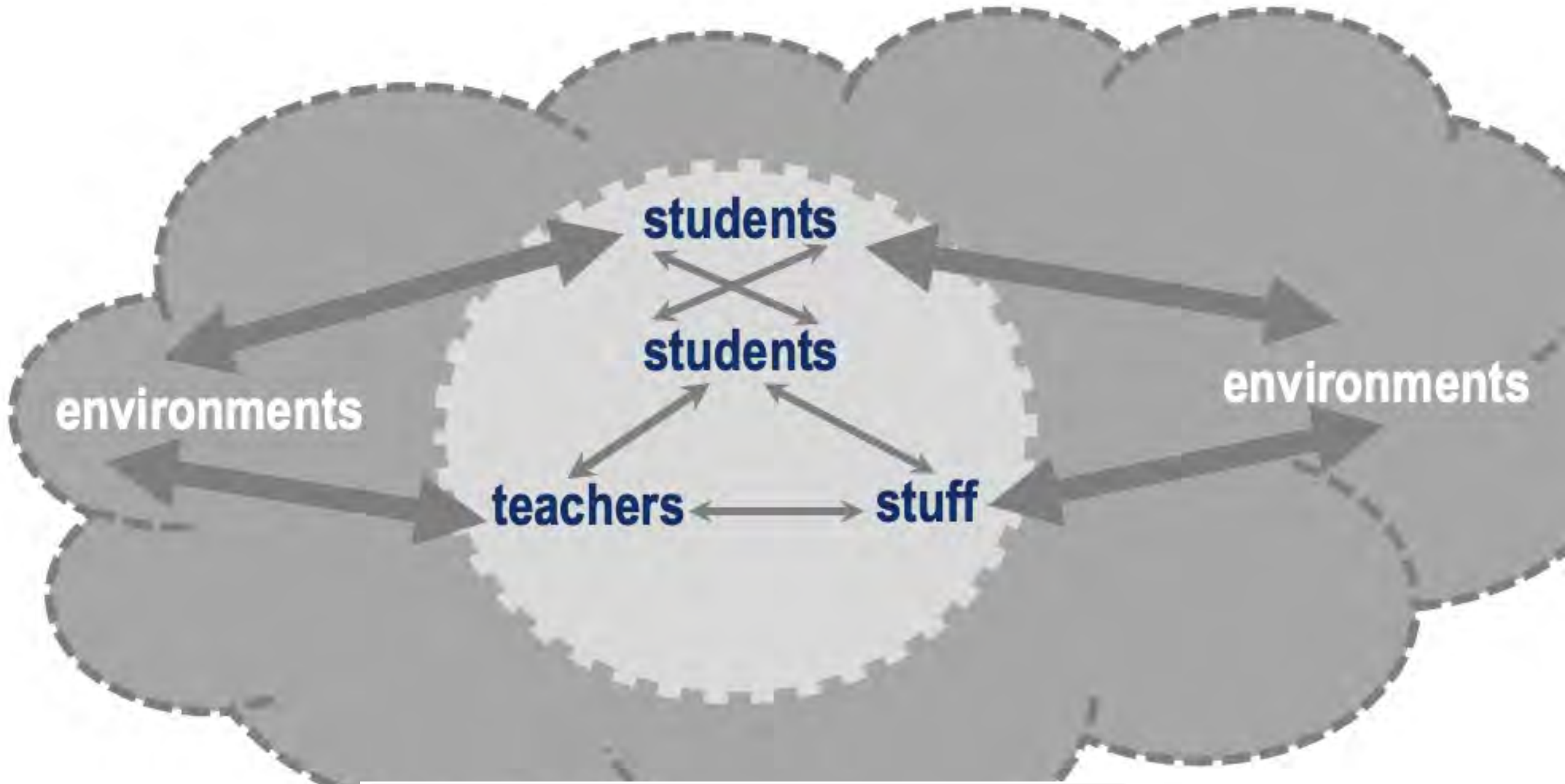
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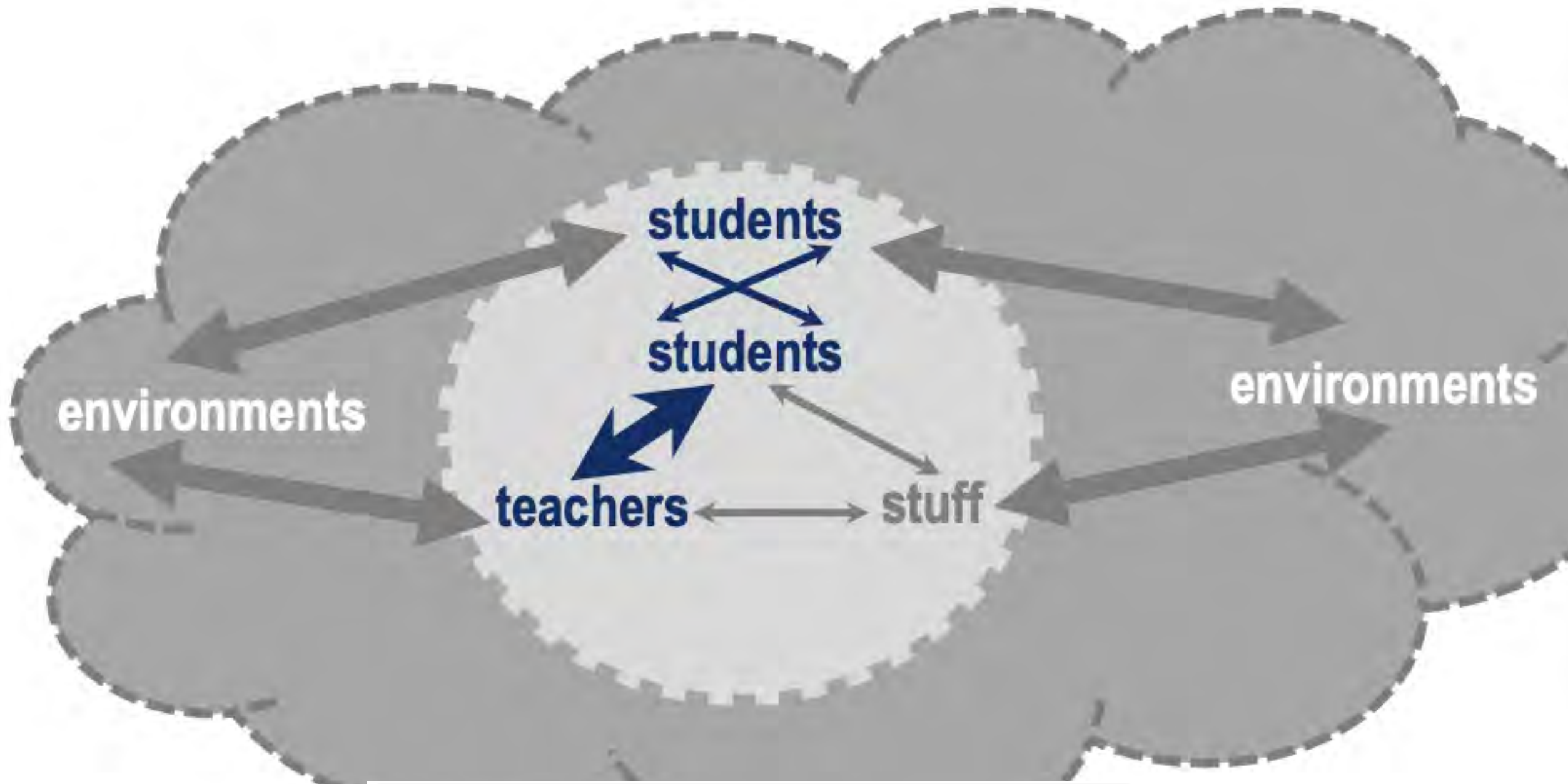
ANIYAH

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What commonly  
would happen  
next?

What are the  
possible results?



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# IN THIS MOMENT, A MOVE CAN REPRODUCE PATTERNS OF MARGINALIZATION OF BLACK GIRLS AND REDUCTIONIST VIEWS OF MATH

## NORMALIZED NEXT MOVES

- “Can someone help Aniyah out and show what we call the whole on the number line?”
- “Great, Aniyah, almost! But remember that the whole is from 0 to 1.”
- “Thumbs up if you agree with Aniyah; thumbs down if you disagree.”

## RESULTS

- Aniyah is excluded and her mathematical contributions are sidelined.
- Aniyah’s answer is signaled to be incorrect and she is positioned as not having contributed to the work.
- Aniyah’s solution is “voted” on by her classmates.

# IN THIS MOMENT, TOO

## NORMALIZED NEXT MOVES

- “Toni, when you’re ready to participate appropriately by not playing with your hair and laughing, and have a question to ask, I will come back to you.”
- “You need to be a better listener, Toni. Aniyah already explained why she picked one-seventh. Who else has a real question for Aniyah?”
- “In this classroom, we are respectful of one another. When you are ready to be respectful, you can rejoin the discussion, Toni.”

## RESULTS

- Toni is publicly excluded from the discussion.
- Toni is judged to not be listening, her question is judged as not good, and she is excluded from the discussion.
- Toni is publicly named and shamed as “disrespectful,” rebuked, and her role in advancing the mathematics is sidelined.

# WHAT DO THESE DIFFERENT TEACHING MOVES DO TO TONI AND ANIYAH? AND THE OTHER CHILDREN?



- Toni's contributions to the class are not read as appropriate or valuable.
- Her participation and mathematical attentiveness are made invisible.
- Her mathematical identity is not supported.

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- Aniyah is positioned as "struggling."
- Her precise explanation is not only not highlighted and acknowledged, but not even heard.
- Aniyah is interpreted as lacking confidence and needing to be protected.

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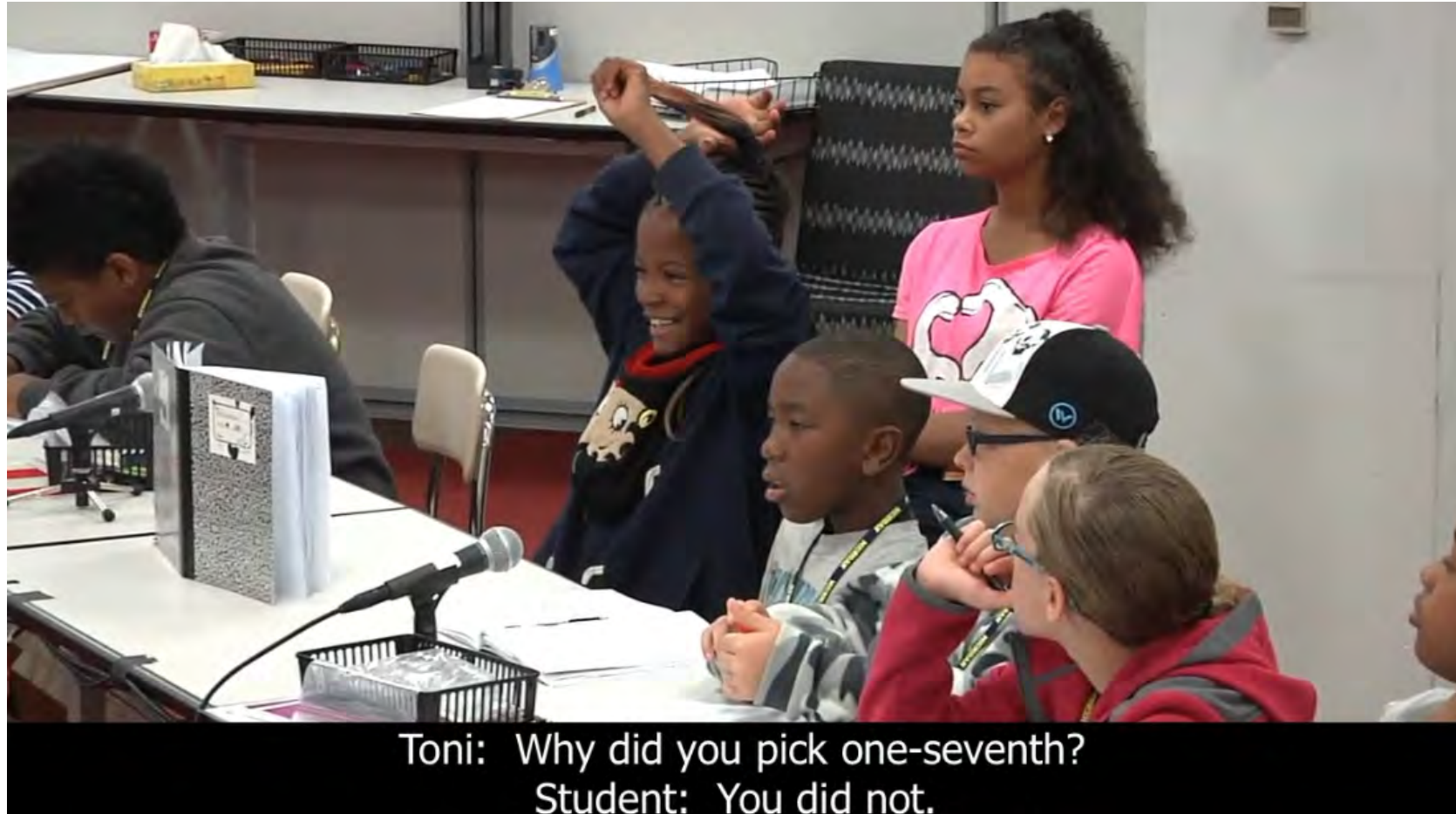


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- Her precise explanation is not only not highlighted and acknowledged, but not even heard.
- Aniyah is interpreted as lacking confidence and needing to be protected.

These perpetuate images of Black girls as "troublemakers" and not "good at math."



# VIDEO: ANIYAH AND TONI



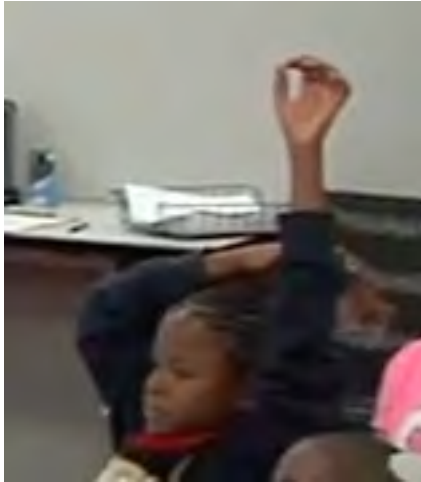
This video and additional supporting materials are available online [here](#).

# USING DISCRETIONARY SPACES TO DISRUPT INSTEAD OF PERPETUATE PATTERNS



- Reading Toni as asking a real question that she means.
- Hearing Toni's question as central to the advancing of the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as disruptive.

# USING DISCRETIONARY SPACES TO DISRUPT INSTEAD OF PERPETUATE PATTERNS

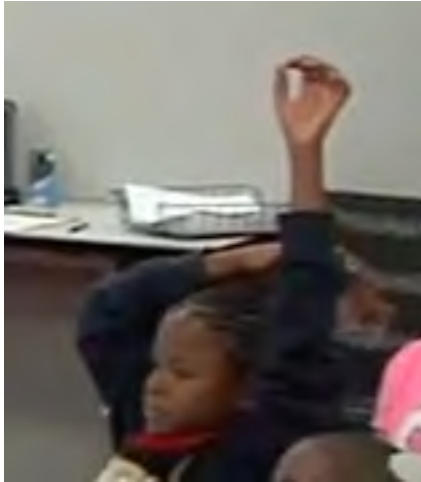


- Reading Toni as asking a real question that she means.
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- Reading Aniyah as competent to answer questions about her ideas.
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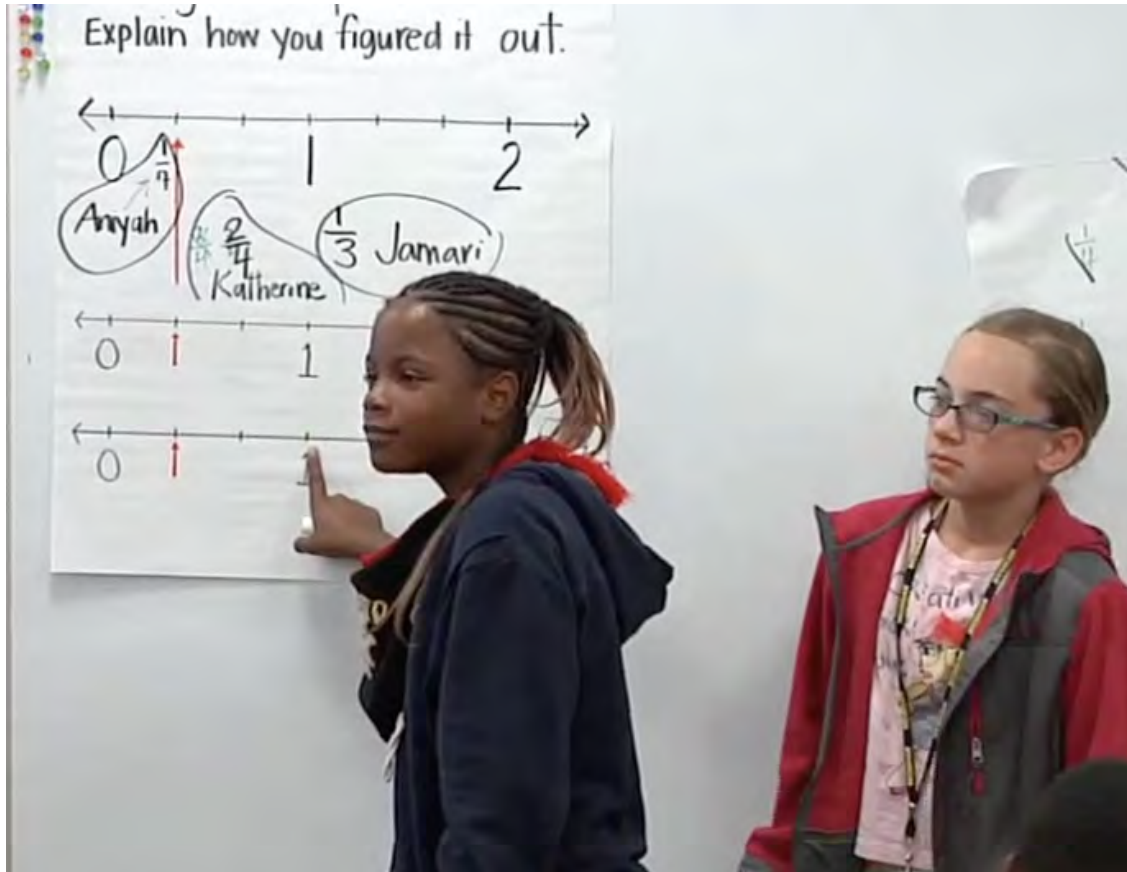


- Reading Aniyah as competent to answer questions about her ideas.
- Hearing Aniyah's explanation as central to the advancing of the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as struggling.

- Other children hear Aniyah as getting the discussion going, and Toni as asking an important mathematical question.
- Aniyah and Toni are both positioned as contributing to the discussion.
- Children see a teacher attending to Black girls as mathematical thinkers and contributors to collective work.

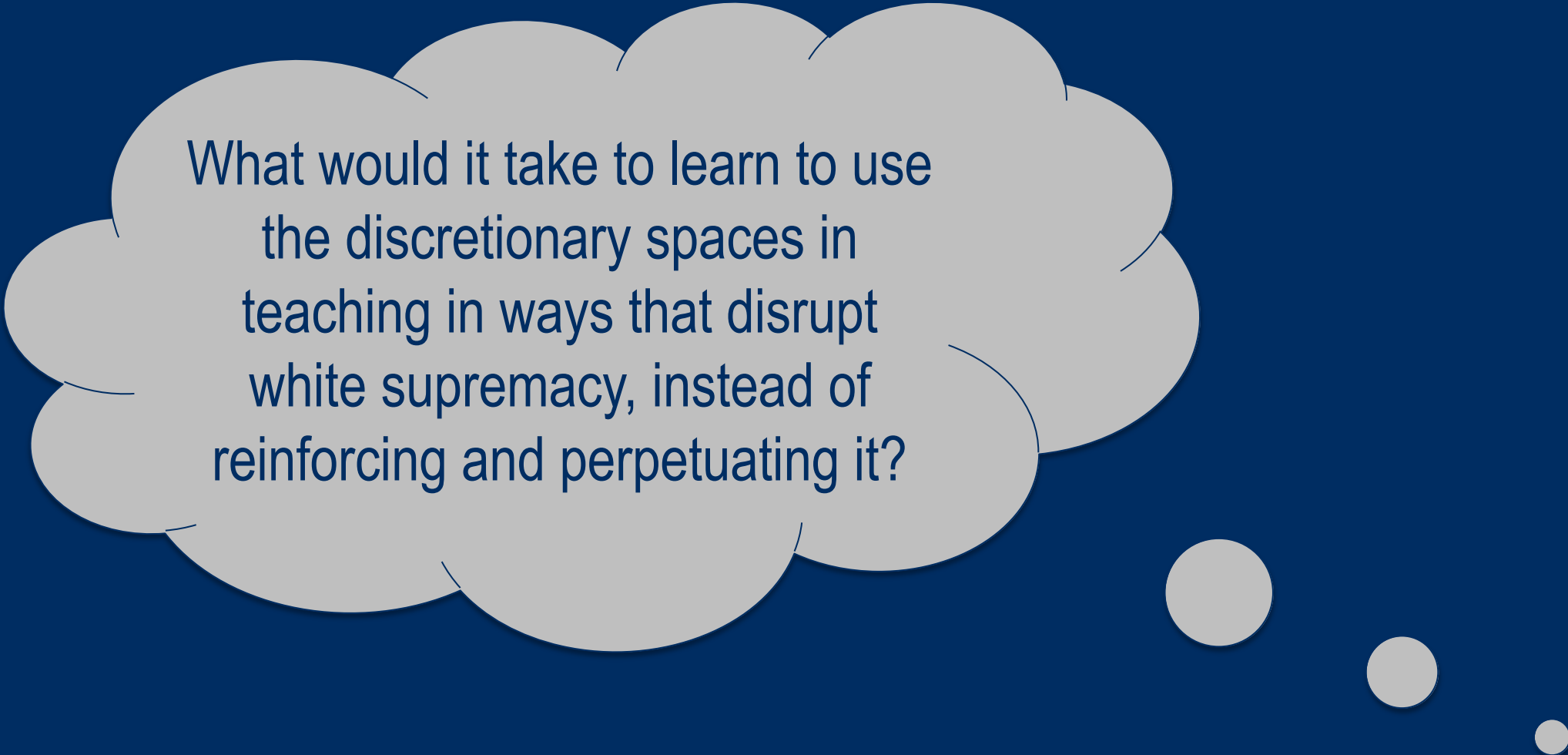
# 14 MINUTES AFTER WHERE WE STOPPED

TONI



ANIYAH

I did well on my goal today because my goal was to to share my ideas with the class and I did I went up to the board And share my idea with the Class on Fractions.



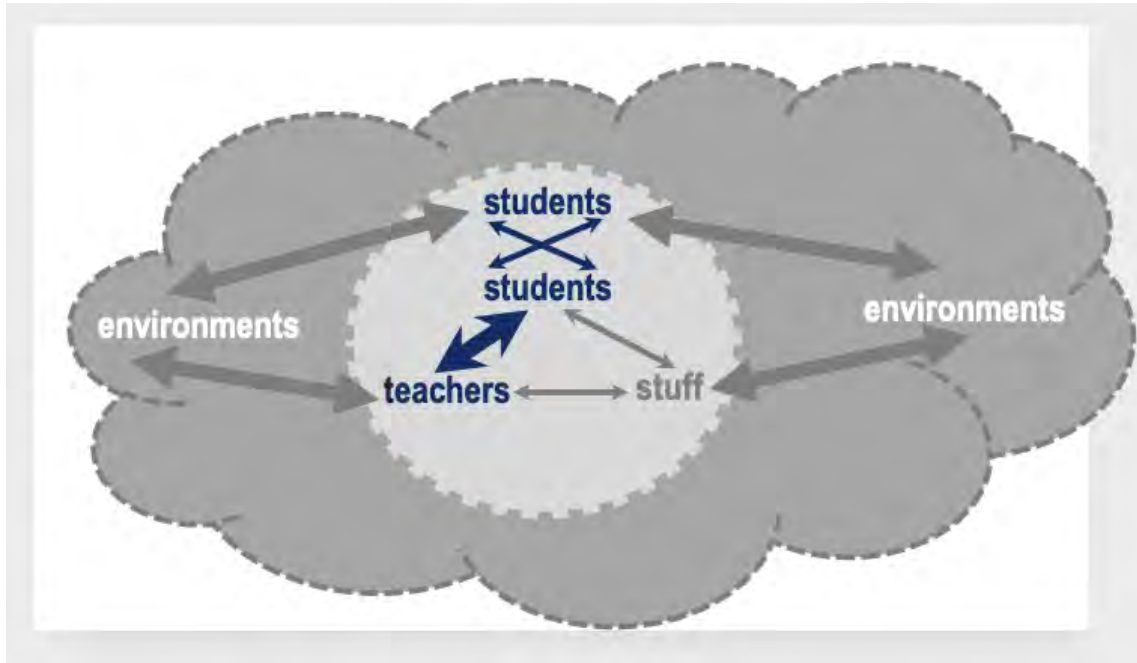
What would it take to learn to use  
the discretionary spaces in  
teaching in ways that disrupt  
white supremacy, instead of  
reinforcing and perpetuating it?



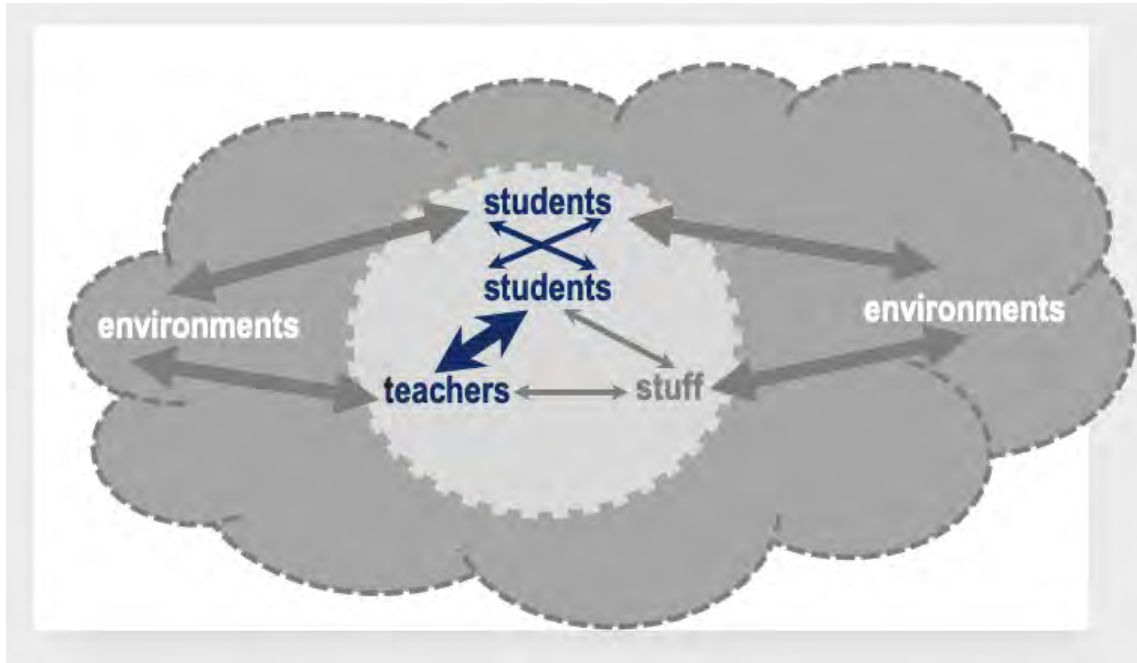
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# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?



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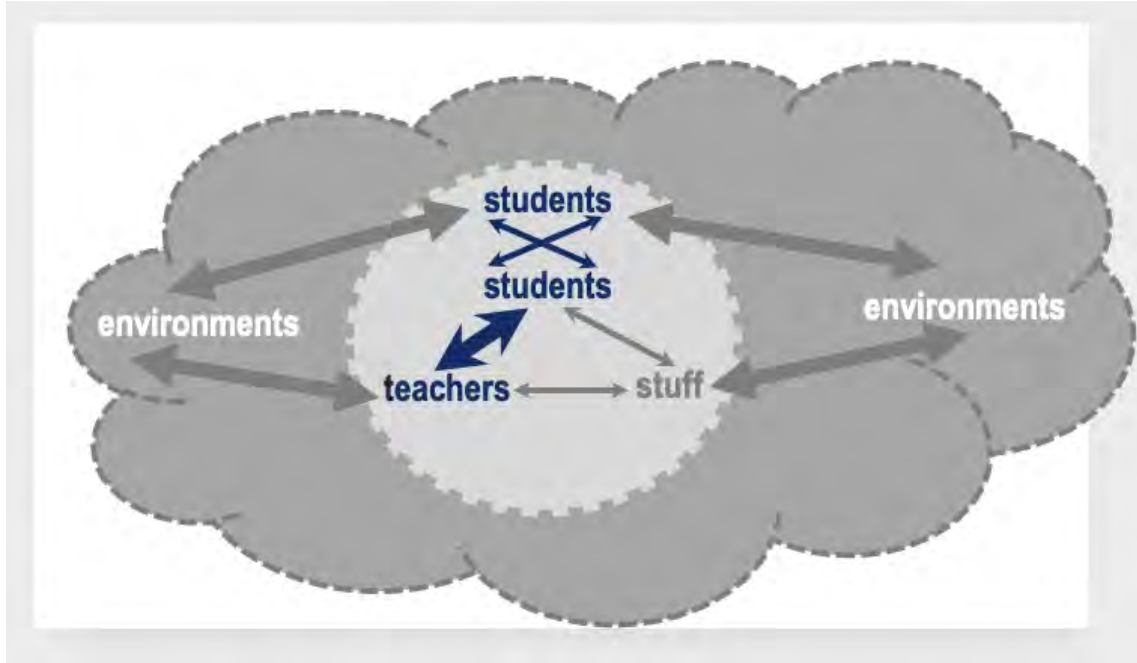


1. Teachers' experiences in a society filled with racism and oppression.

Lortie (1975), Banks, Grant and Koskela, Moll



# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?



1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schools that institutionalize dominant values and habits.

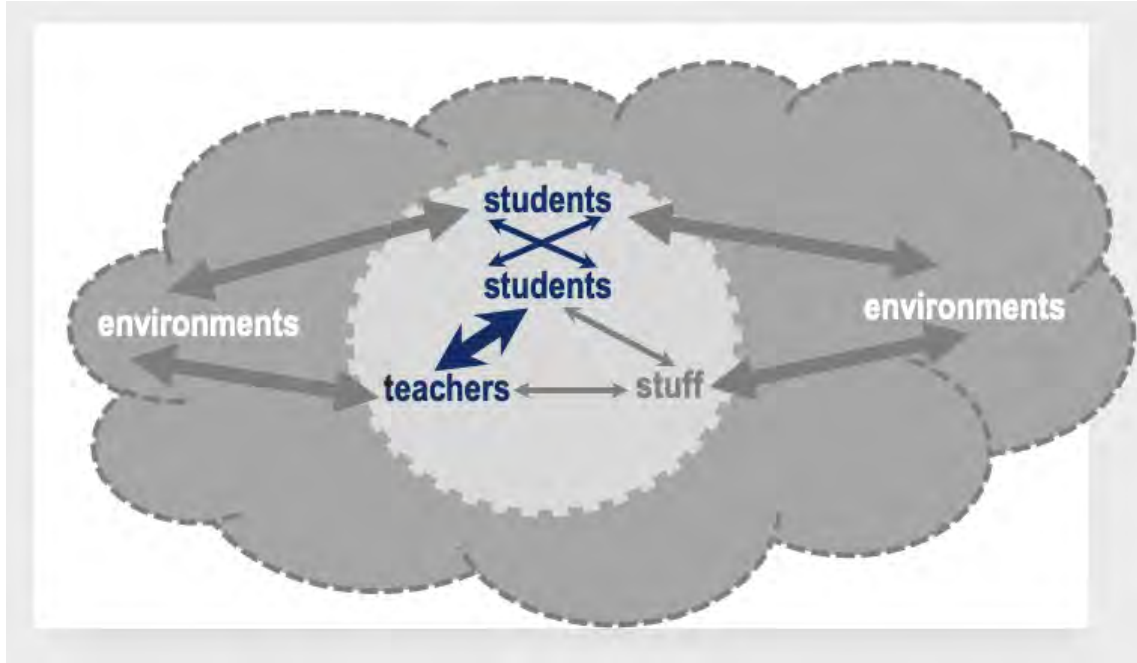
Lortie (1975), Banks, Grant and Koskela, Moll  
Anyon (1981), Heath, Martin, Tuck

# WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?

Professional education does not effectively intervene on these.

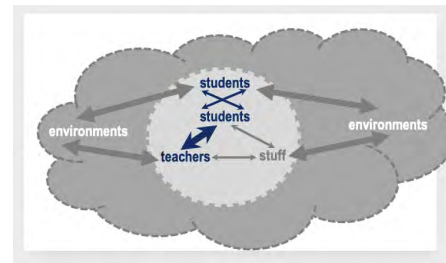
1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schools that institutionalize dominant values and habits.

Professional education and teaching experience often teach these.



Lortie (1975), Banks, Grant and Koskela, Moll  
Anyon (1981), Heath, Martin, Tuck

# WHAT DOES IT TAKE TO DISRUPT THE PATTERNS THAT MARGINALIZE AND REINFORCE RACISM?

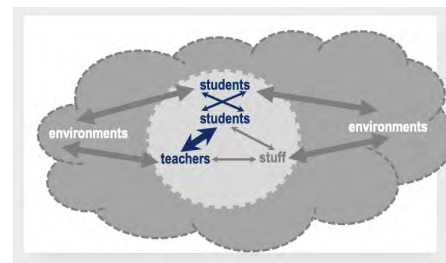


Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015

# WHAT DOES IT TAKE TO DISRUPT THE PATTERNS THAT MARGINALIZE AND REINFORCE RACISM?



- Seeing Toni's question as key to the class's work



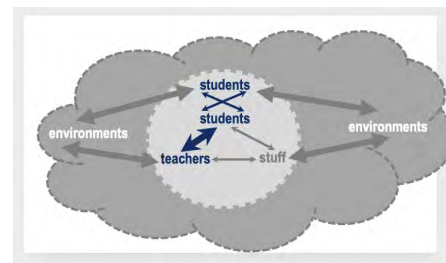
Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015

# WHAT DOES IT TAKE TO DISRUPT THE PATTERNS THAT MARGINALIZE AND REINFORCE RACISM?



- Seeing Toni's question as key to the class's work

Knowing and using mathematics in teaching (MKT)



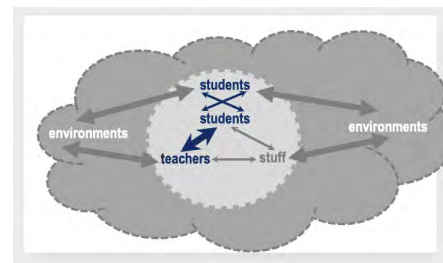
Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015

# WHAT DOES IT TAKE TO DISRUPT THE PATTERNS THAT MARGINALIZE AND REINFORCE RACISM?



- Seeing Toni's question as key to the class's work
- Taking as axiomatic the brilliance of Black children, and thus Toni and Aniyah

Knowing and using mathematics in teaching (MKT)



Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015

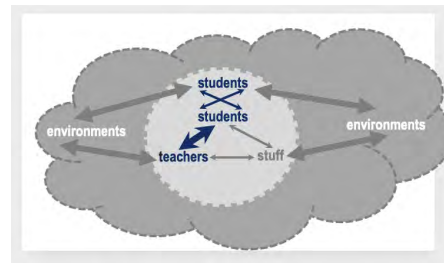
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Knowing and using mathematics in teaching (MKT)

Interpreting Toni as asking a mathematical question that she means



Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015

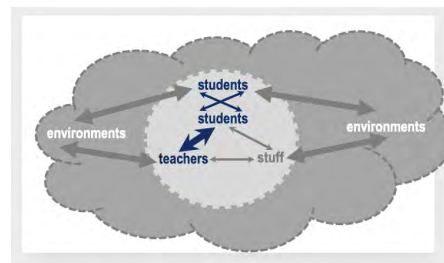
# WHAT DOES IT TAKE TO DISRUPT THE PATTERNS THAT MARGINALIZE AND REINFORCE RACISM?



- Seeing Toni's question as key to the class's work
- Taking as axiomatic the brilliance of Black children, and thus Toni and Aniyah.
- . . . AND having something different to DO

Knowing and using mathematics in teaching (MKT)

Interpreting Toni as asking a mathematical question that she means



Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015



# WHAT DOES IT TAKE TO DISRUPT THE PATTERNS THAT MARGINALIZE AND REINFORCE RACISM?

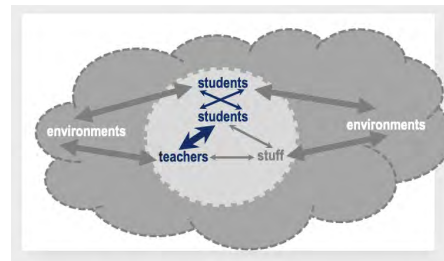


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- . . . AND having something different to DO

Knowing and using mathematics in teaching (MKT)

Interpreting Toni as asking a mathematical question that she means

Having a repertoire of practices that can be adapted and used in contexts



Gholson & Martin, 2014; Langer-Osuna, 2015, 2017; Leonard & Martin, 2013; Martin, 2012, 2015

# WHAT UNDERSTANDING OF MATHEMATICS IS INVOLVED?

In hearing and seeing Aniyah?

In hearing and seeing Toni?

# MOVING ON

Discretionary spaces describe the many spaces and moments in which teachers make subjective judgments that either:

- act from habit and from patterns of white supremacy institutionalized in experience and professional training
- or act to dismantle anti-Black racism and white supremacy.

Understanding mathematics matters for doing this meaningfully!

# There is no neutral.

\*Imani Goffney, Ibram X. Kendi



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Teaching is a natural human activity.

but . . .

Natural = “Normal” = White

**So** — teaching that enables children to thrive and that disrupts patterns of white supremacy and oppression requires **challenging** what seems natural.



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**This is our work.**

**To build mathematics teaching as a force for justice.**

Our power is in our collective efforts to make mathematics teaching work. . . . .

. . .to learn, to grow, to share, and to push forward with the fight.



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# THANK YOU!

dball@umich.edu

Slides will be available on my website

<https://deborahloewenbergball.com/>

(“Google” Deborah Ball)



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Photo from “Protest erupts in Phoenix after viral video shows police fatally shooting man in parked car,” by Allyson Chiu, The Washington Post  
Retrieved from <https://www.washingtonpost.com/nation/2020/07/06/phoenix-protest-police-shooting/>

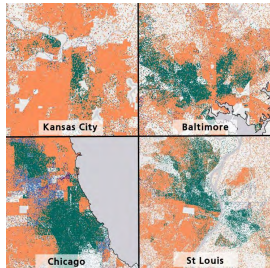


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Graphic from “Why don't black and white Americans live together?,” by Rajini Vaidyanathan, BBC News  
Retrieved from <https://www.bbc.com/news/world-us-canada-35255835>



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Graphic from “Housing Segregation In Everything” by Code Switch, National Public Radio.  
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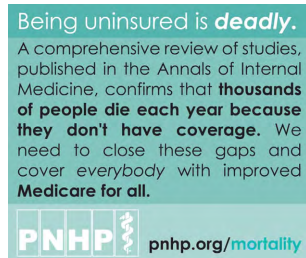


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Graphic from "Who got the right to vote when? A history of voting rights in America," Al Jazeera Retrieved from <https://interactive.aljazeera.com/aje/2016/us-elections-2016-who-can-vote/index.html>



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Photo from “Black doctors earn less than white peers, study reveals” by Stacy M. Brown, The Philadelphia Tribune.  
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Retrieved from <https://www.sfchronicle.com/opinion/openforum/article/Be-kind-to-your-poll-worker-a-creature-near-12966972.php>



Image on slides 5–7:

Photo from “Trump Rioters Storm U.S. Capitol (photos),” Variety

Retrieved from <https://variety.com/gallery/trump-rioters-storm-us-capitol-photos/congress-electoral-college-8/>



Image on slides 6 and 7:

Photo from “20 Classroom Interventions for Children with Anxiety Disorders” by Jerry Kennard, Ph.D., HealthCentral.

Retrieved from <https://www.healthcentral.com/article/20-classroom-interventions-for-children-with-anxiety-disorders>



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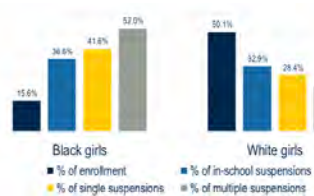
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Image on slide 7:

Photo from “10 Ways Well-Meaning White Teachers Bring Racism Into Our Schools” by Jamie Utt, everyday feminism.

Retrieved from <https://everydayfeminism.com/2015/08/10-ways-well-meaning-white-teachers-bring-racism-into-our-schools/>



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Epstein, R., Blake, J., & González, T. (2017). *Girlhood interrupted: The erasure of Black girls' childhood*. Washington, DC: Georgetown Law Center on Poverty and Inequality.

Retrieved from <https://www.law.georgetown.edu/poverty-inequality-center/wp-content/uploads/sites/14/2017/08/girlhood-interrupted.pdf>



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