

The Power of Teaching Mathematics in the Struggle for Justice

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Understanding the power of the work of teaching and its role the struggle for justice

How is teaching powerful?

Why does it matter when we don't pay attention to the actual work of teaching?

How can we as teachers leverage the power of teaching?

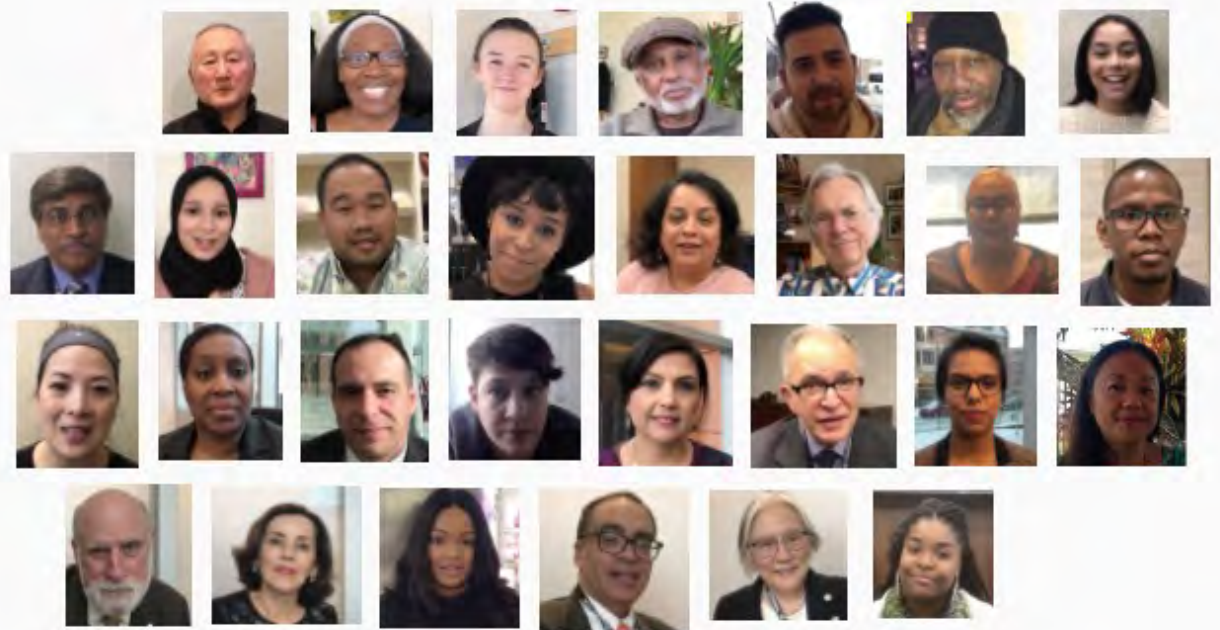


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1. How is teaching powerful?

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Video: Is there a teacher who had a significant impact on you?



2. Why does it matter when we don't pay attention to the actual work of teaching?

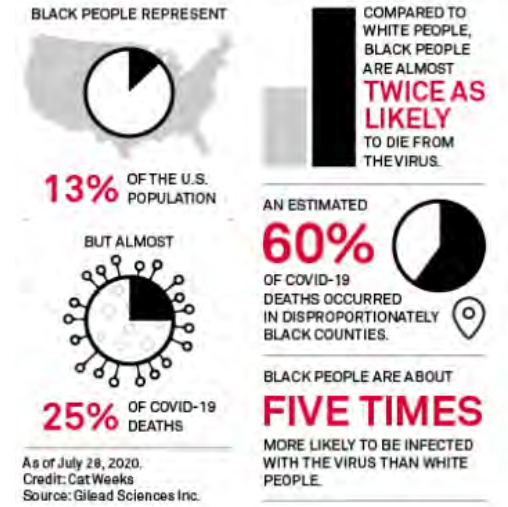


We fail to connect the dots.

**And that means that our actions are
complicit in continuing pervasive
patterns of injustice and inequity.**



COVID-19 inequity in the US, by the numbers

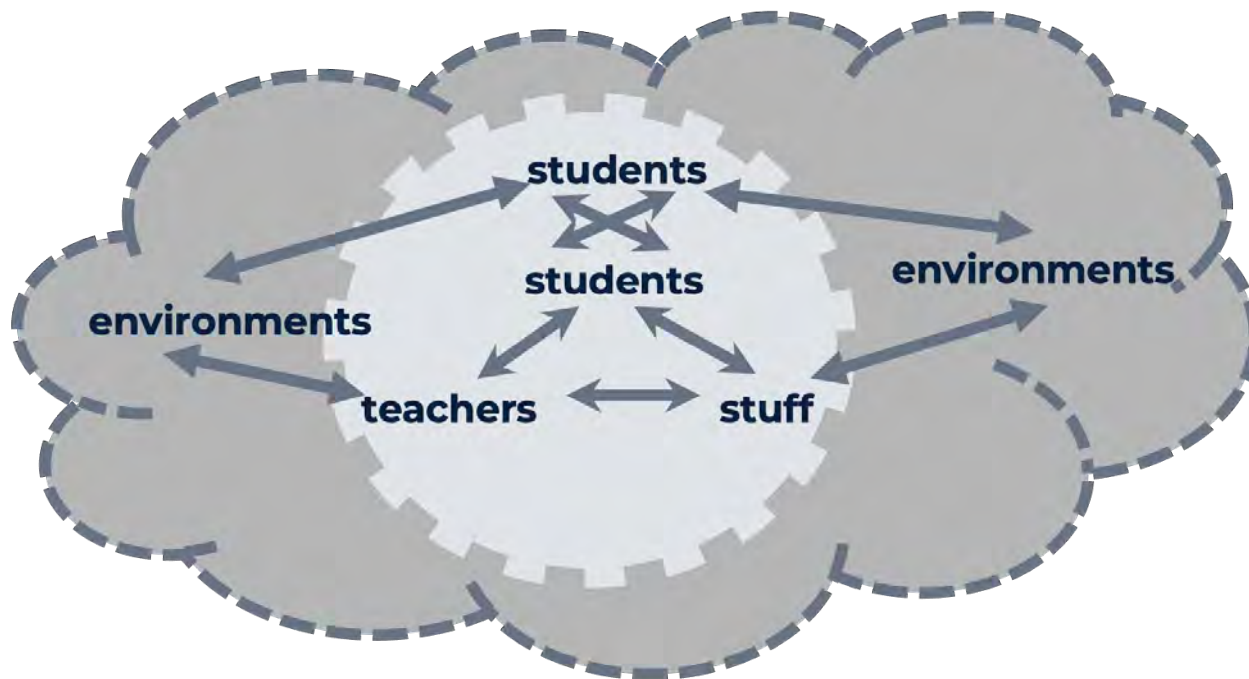


ECONOMIC INEQUALITY

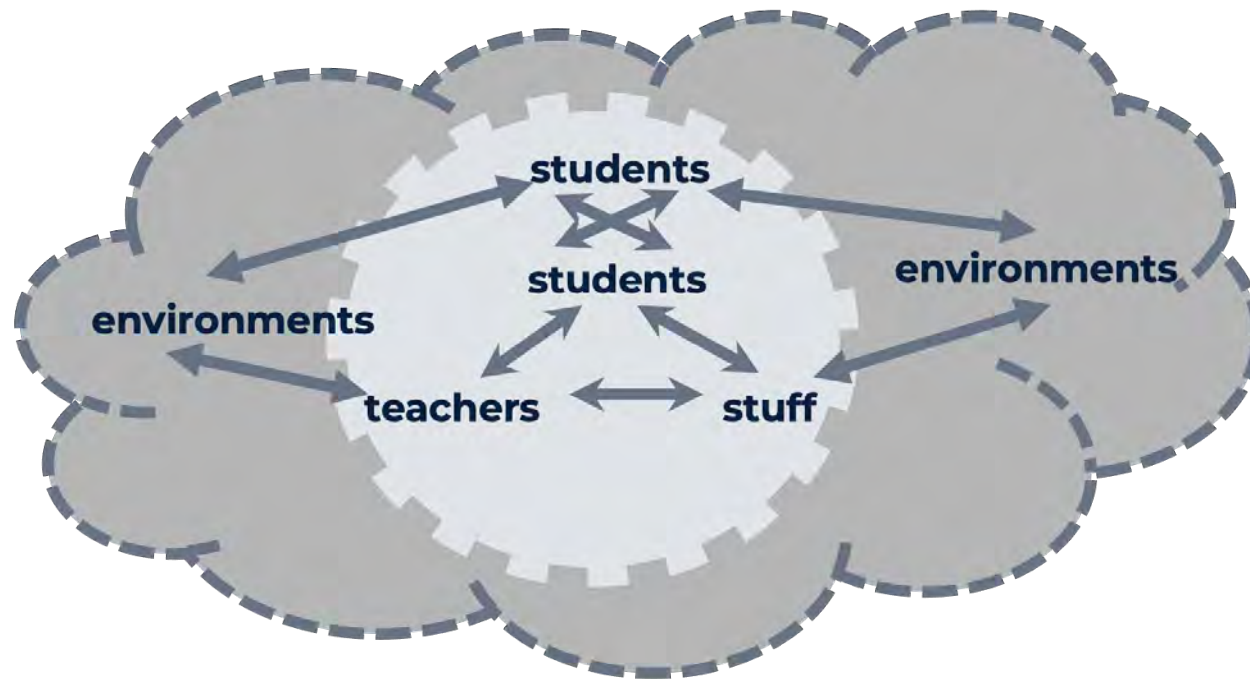


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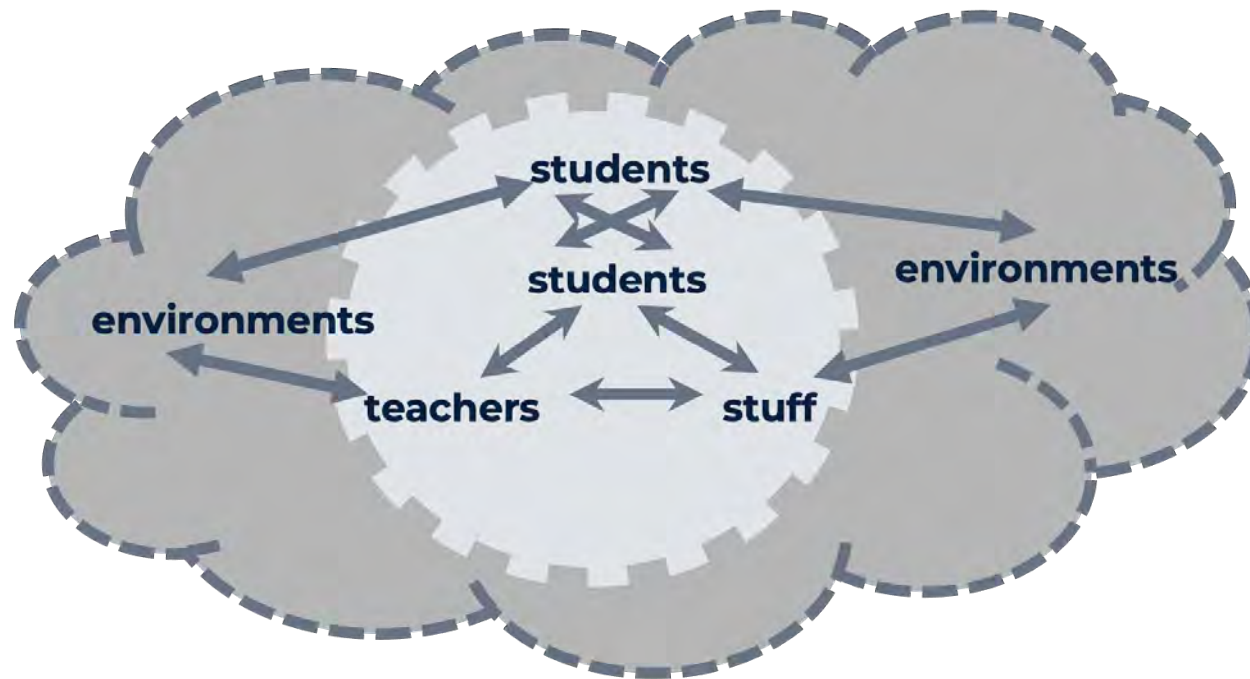
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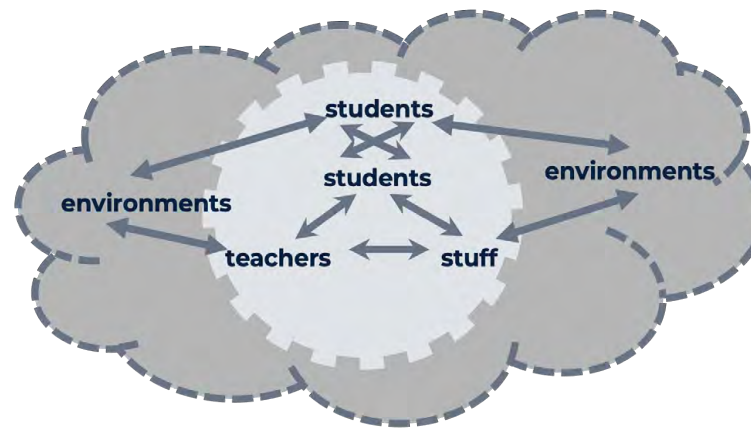
1. Teaching and learning are constructed interactively and are interpretive.



1. Teaching and learning are constructed interactively and are interpretive.
2. They take place within broad historical and socio-political environments.

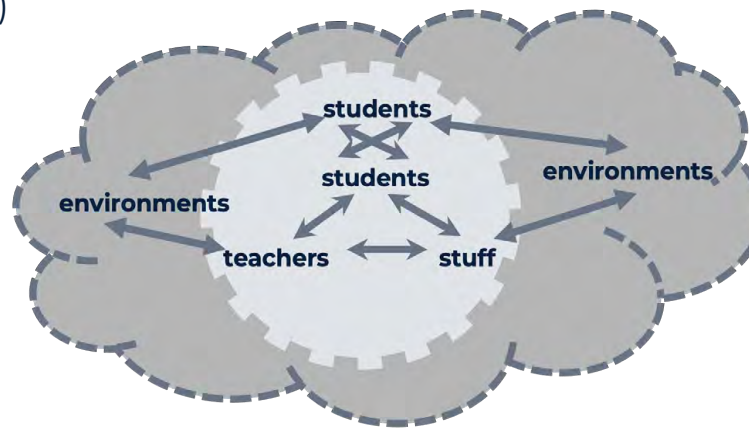


How do macro level factors interact with everyday practices?



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The relationships between—
Macro-level structures (in environments)
(e.g., institutional racism, history of intelligence as the property of white people, anti-Black “scientific” racism; legacies of violence against Black and Indigenous people)

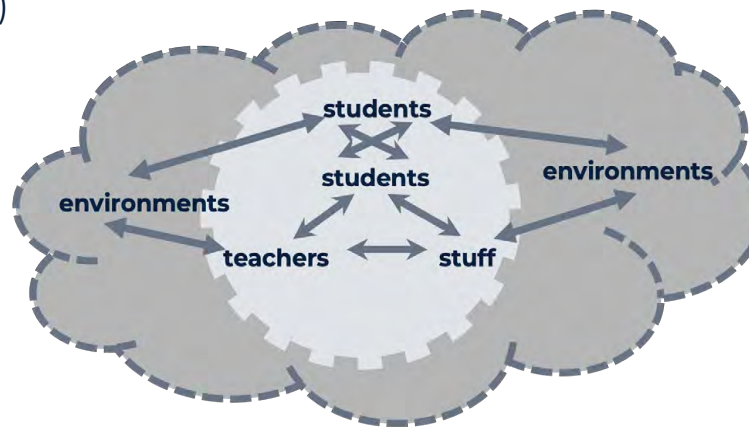


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Micro-level interpersonal interactions
(in everyday life and in classrooms)
(e.g., teachers’ judgments of students, who is seen as “smart,” disproportional punishment and assignment to special ed and gifted programs)

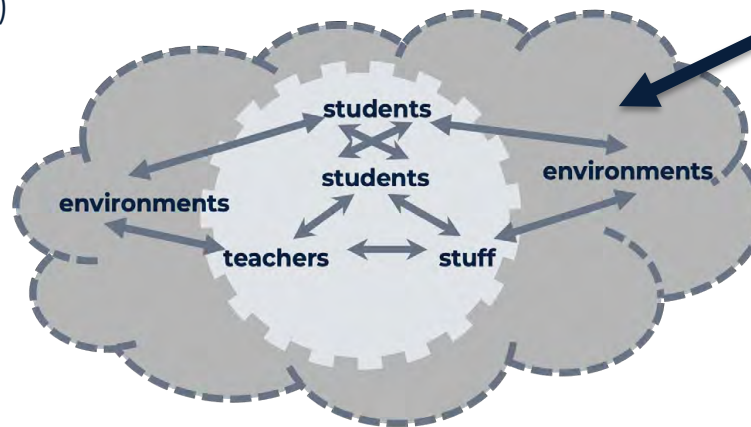


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Notice that the arrows run both ways.

The environments in which we are all steeped shape what we take for granted and do, but learning these as normal further reinforces their persistence in society.







1. **Teaching is powerful.** When it is done with care and judgment, students can thrive—learn content, 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 racialized and oppressive patterns of social, personal, and epistemic injustice and harm, or it can **disrupt these patterns.**

3. How can we as teachers leverage the power of teaching?



The unique potential of mathematics to perpetuate injustice—or disrupt it

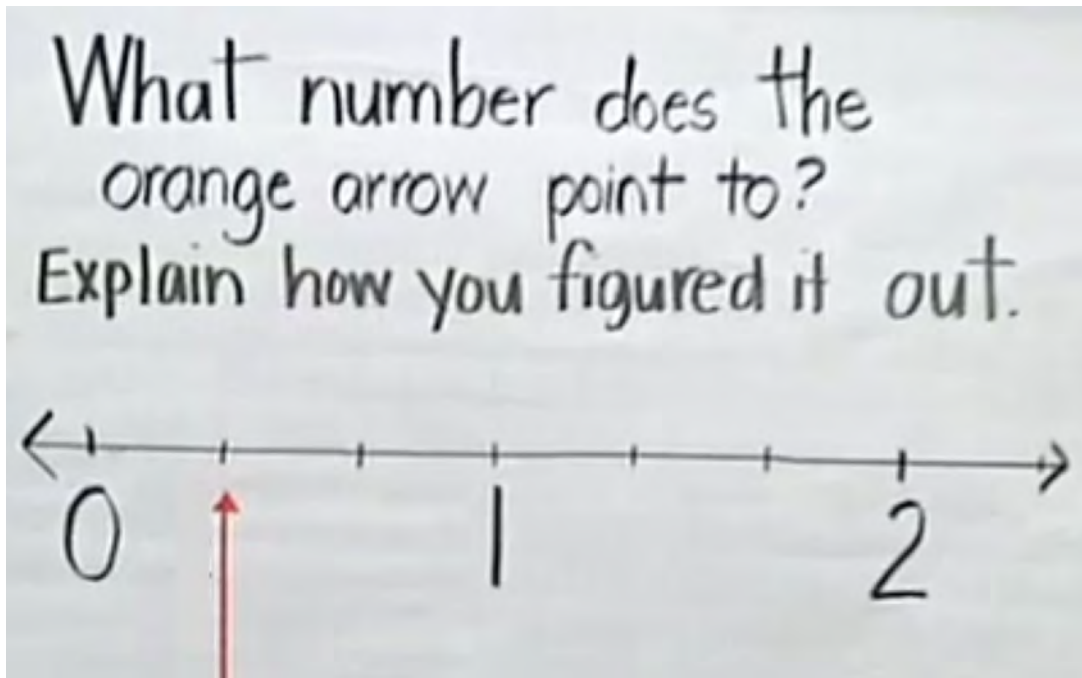
- The history of “mathematics” and who has constructed what we call math (i.e., white, male, western)
- The melding of “intelligence” and mathematics (and the history of “intelligence”)
- Narrow constructions of “mathematics” that uphold these
- The rich resources of mathematics in many communities and 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



Fractions as numbers: The instructional goal for student understanding

3.NF.2.a

Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.





Aniyah



Toni

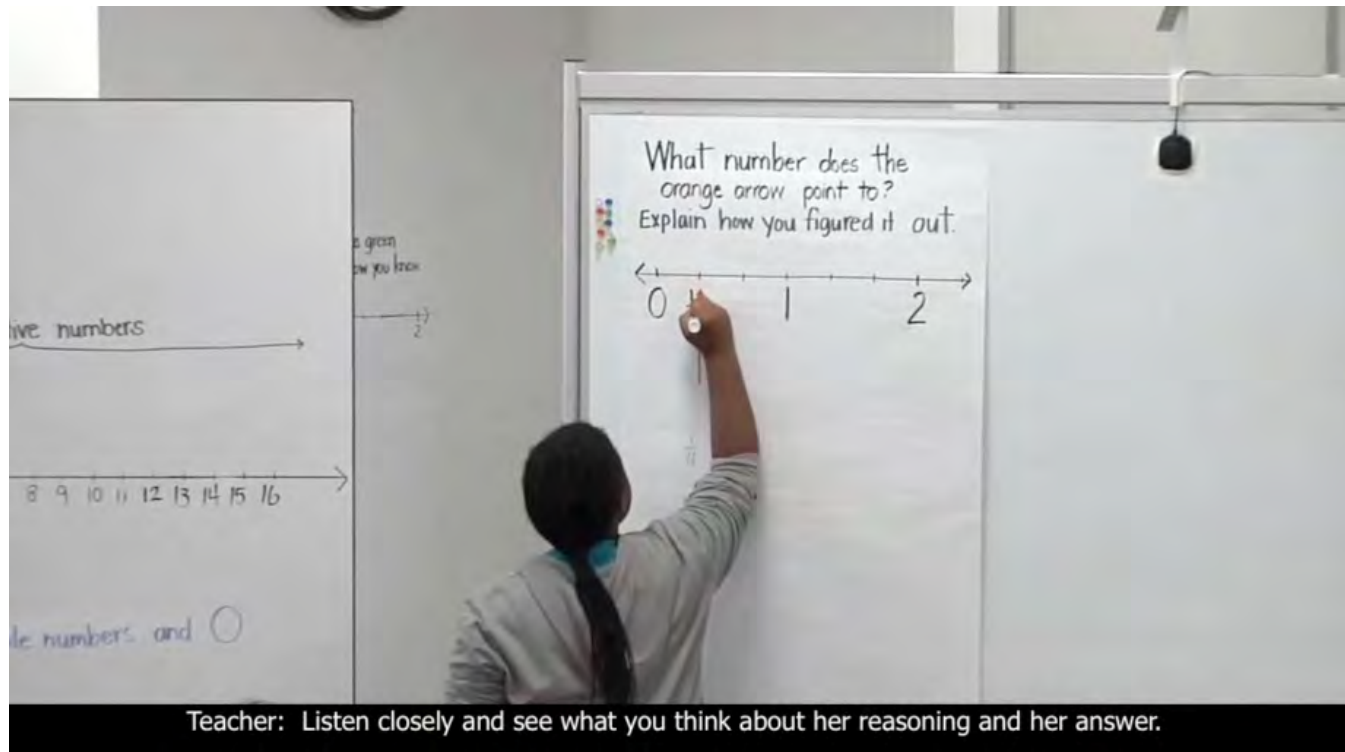


Viewing focus

What do you see about each girl's mathematical knowledge and skill?



Video: Aniyah and Toni



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

Discuss

What do you see about each girl's mathematical knowledge and skill?



What would
happen
next?

What are the
possible
results?



In the next moment, what is likely to happen?

NORMALIZED NEXT MOVES

RESULTS



In the next moment, what is likely to happen?

NORMALIZED NEXT MOVES

- “Can someone help Aniyah out and show what we call the whole on the number line?”

RESULTS

- Aniyah is excluded and her mathematical contributions are sidelined.



In the next moment, what is likely to happen?

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.”

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.



In the next moment, what is likely to happen?

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.



What else is likely?

NORMALIZED NEXT MOVES

RESULTS



What else is likely?

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.”

RESULTS

- Toni is publicly excluded from the discussion.



What else is likely?

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?”

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.



What else is likely?

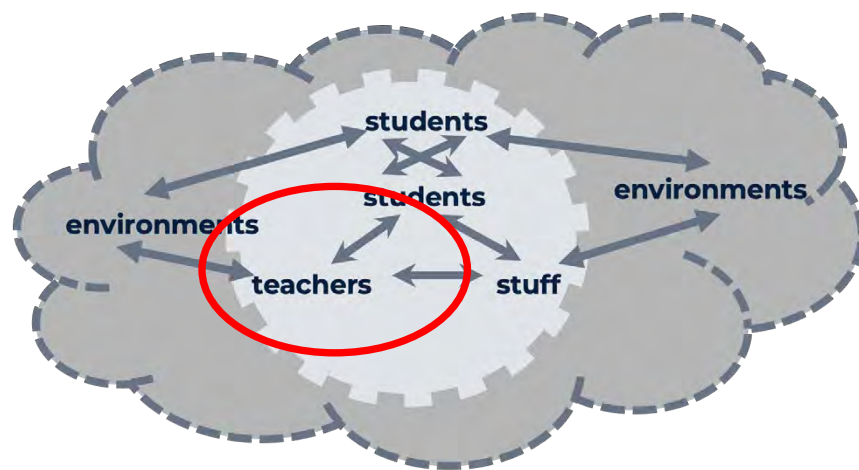
NORMALIZED NEXT MOVES

- “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.”

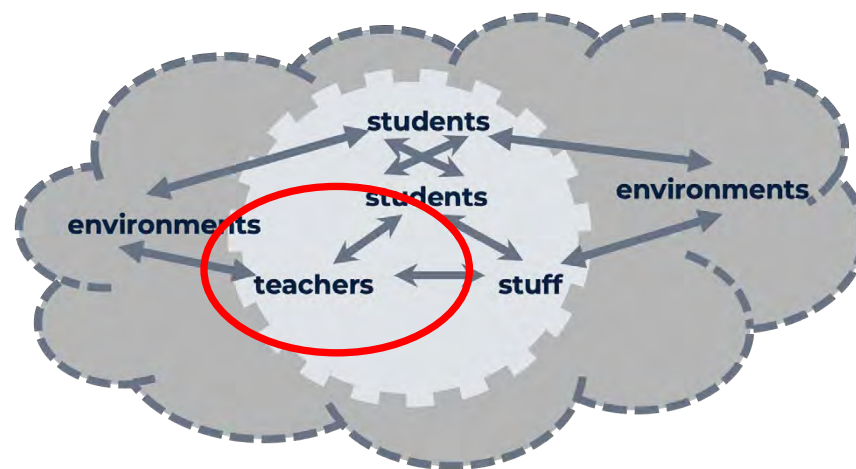
RESULTS

- 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.

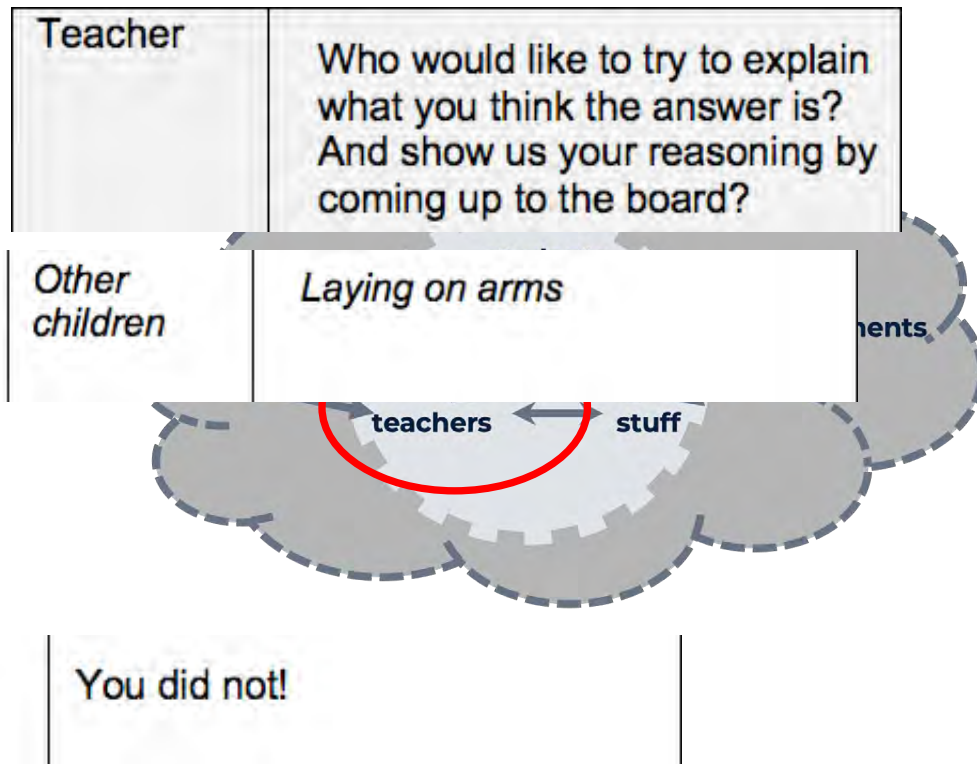




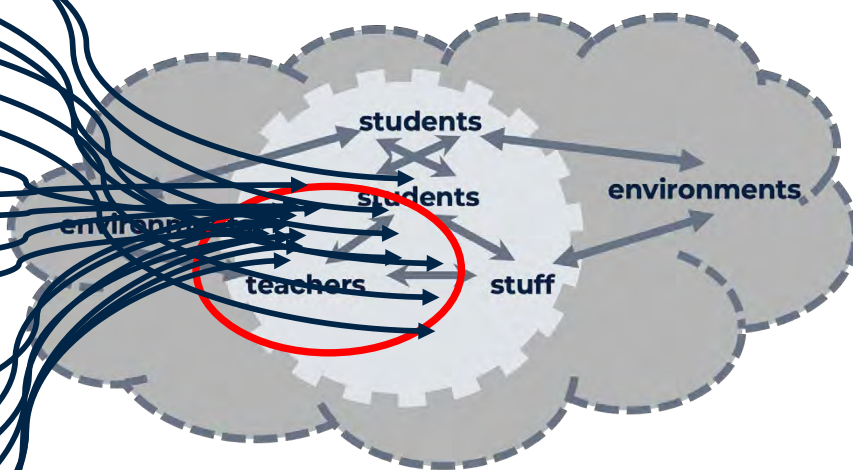
Speaker	Talk	Discretionary space
Teacher	Who would like to try to explain what you think the answer is? And show us your reasoning by coming up to the board? Who'd like to come up to the board and try to tell- And you know, it might not be right. That's okay because we're learning something new. I'd like someone to come up and sort of be the teacher and explain how you are thinking about it. Who'd like to try that this morning?	1. Deciding when to open whole-group discussion 2. Deciding what to do to launch discussion 3. Framing the expectation for presenting 4. Framing of what it "coming to the board" entails
Teacher	Okay, Anyiah?	5. Selecting a student to present
Toni	Playing with hair	6. Deciding whether to comment
Other children	Laying on arms	7. Deciding whether to comment
Teacher	When someone's presenting at the board, what should you be doing?	8. Setting norms for what to do when a student is presenting
Students in chorus	Looking at them.	
Teacher	Looking at that person.	9. Responding to students
Teacher	Uh-huh?	10. Taking up an individual student question
Anyiah	You want me to write it?	
Teacher	You're trying to mark what you think this number is and explain how you figured it out.	11. Clarifying task
Teacher	Listen closely and see what you think about her reasoning and her answer. (Anyiah writes $\frac{1}{7}$ by the orange line).	12. Setting task for the other students
Anyiah	I put one-seventh because there's-	
Toni	Did she say one-seventh?	13. Responding to student
Anyiah	(turns to Toni) Yeah. (continues to class) Because there's seven equal parts, like one, two, three, four, five, six, and then seven. (Uses her fingers to count the parts on the number line).	
Teacher	Before you agree or disagree, I want you to ask questions if there's something you don't understand about what she did. No agreeing and disagreeing. Just. All you can do right now is ask Anyiah questions. Who has a question for her?	14. Setting task for responding to student explanation
Teacher	Okay, Toni, what's your question for her?	15. Selecting student to speak
Dante	You did not!	16. Responding to student speaking across room
Toni	Why did- (laughs at another student who says something to her from across the room)	17. Responding to student laughing
Teacher	Go ahead, it's your turn.	17. Responding to student laughing
Toni	Why did you pick one-seventh?	
Dante	You did not!	18. Responding to student speaking across room
Teacher	Let's listen to her answer now. That was a very good question.	19. Setting task for class
		20. Responding to student



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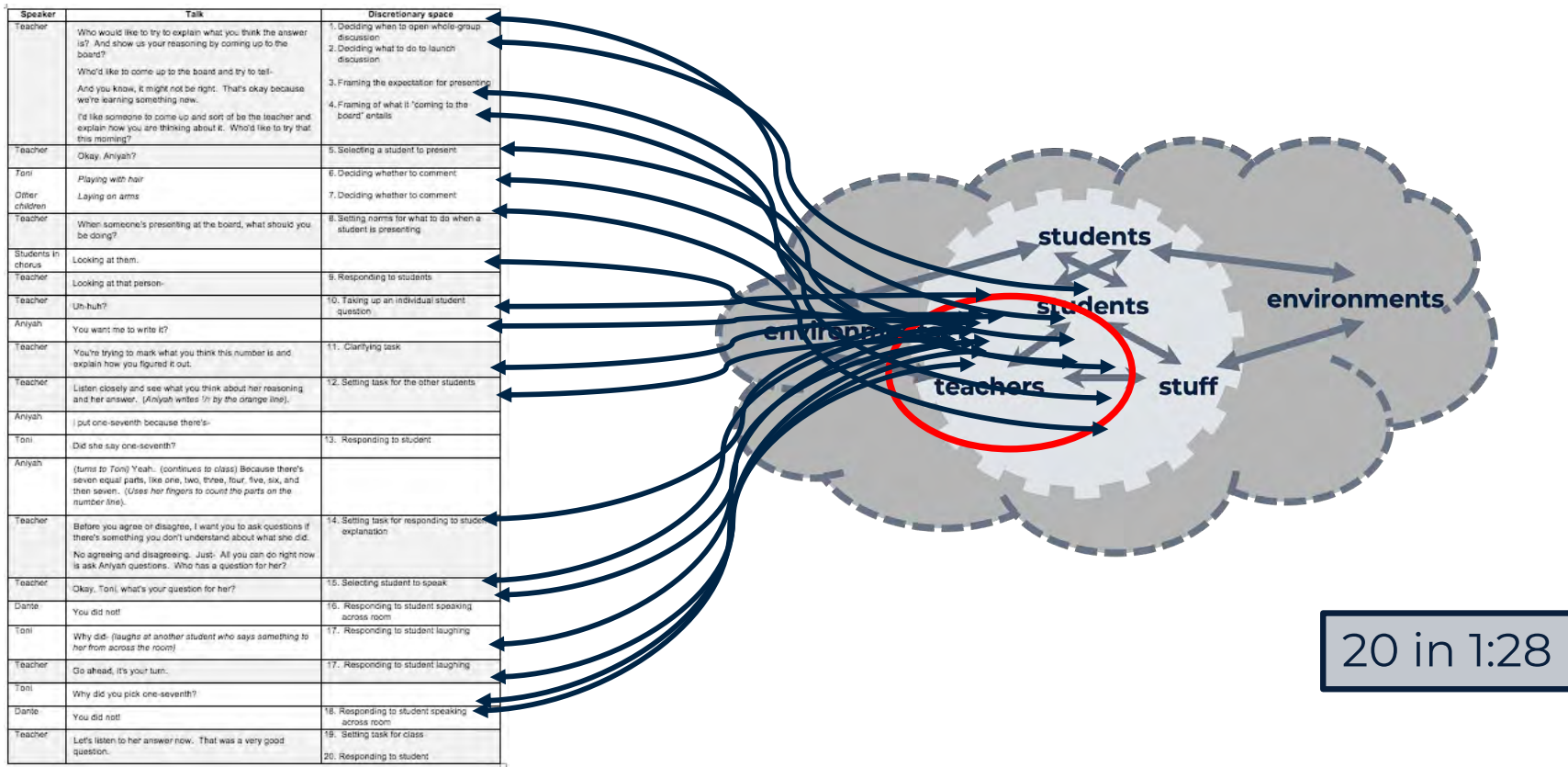


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20 in 1:28

Teaching is dense with “discretionary spaces”



20 in 1:28

Video: Aniyah and Toni



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

Using discretionary spaces with care



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

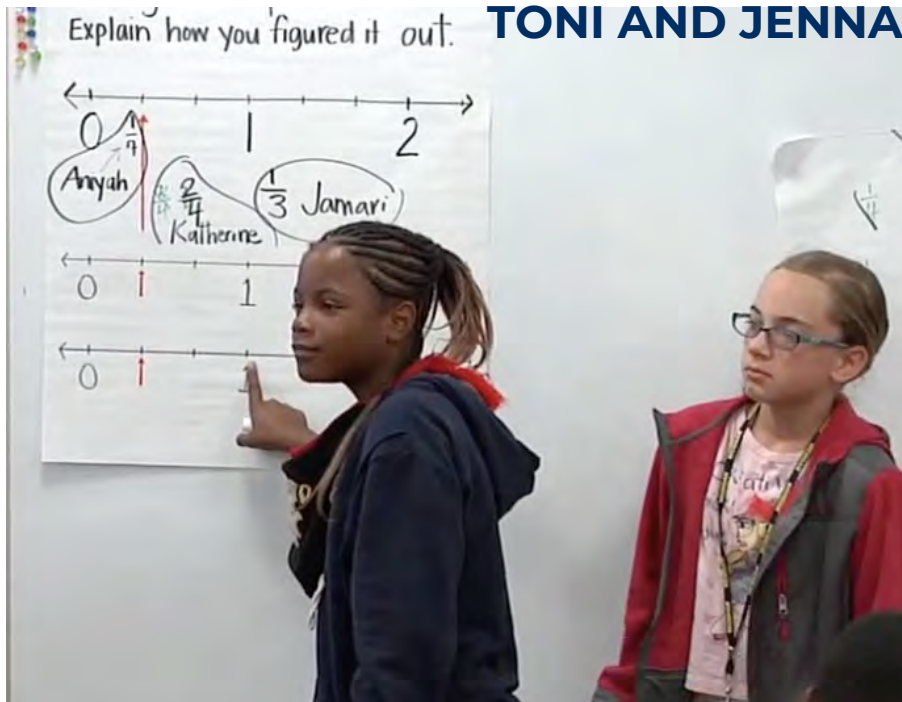


- Other children hear Aniyah as getting the discussion going, and Toni as asking an important mathematical question.
- Aniyah and Toni are both positioned as contributing to the discussion.
- Children see a teacher attending to Black girls as mathematical thinkers and contributors to collective work.



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

14 minutes after where we stopped



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.

AND: On an “exit ticket,” 28 of the children were able to correctly identify a different fraction ($\frac{2}{5}$) on the number line.

Moving On

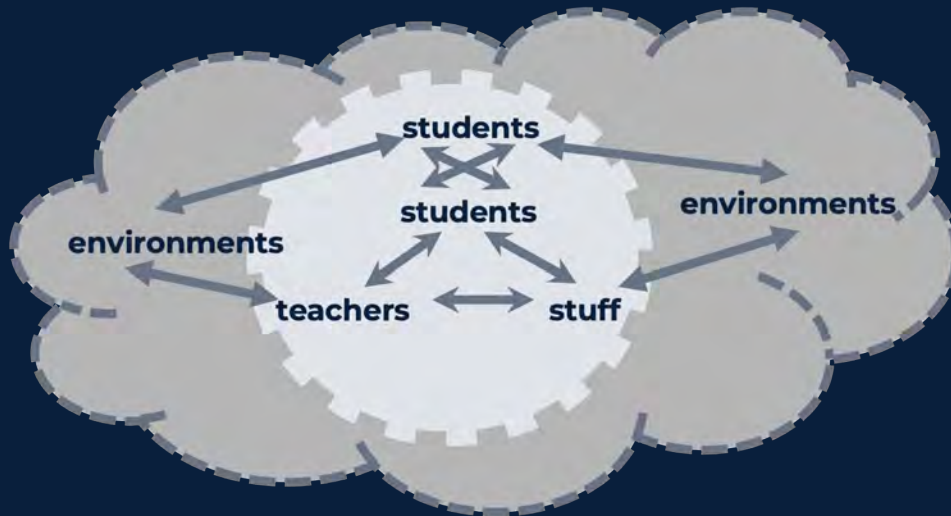
Discretionary spaces describe the many spaces and moments in which teachers make subjective judgments that either:

- ... 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.

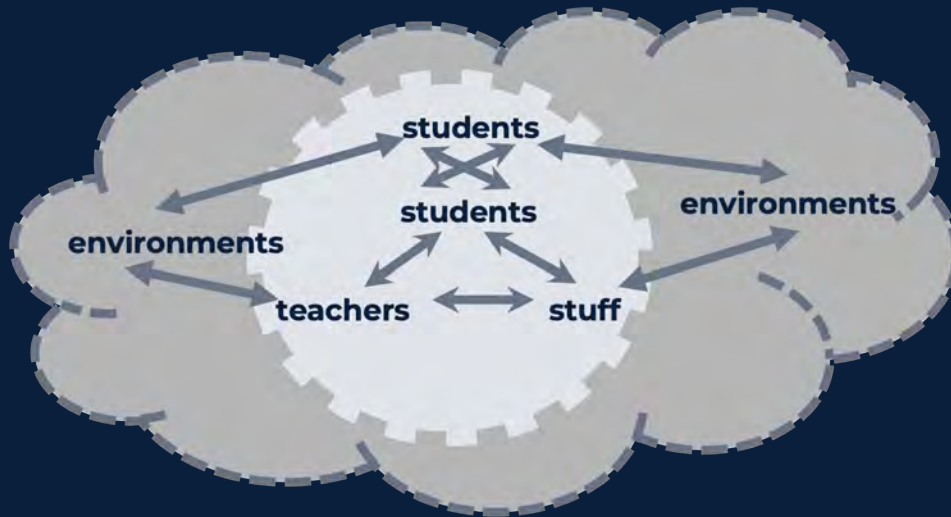
Understanding **content knowledge for teaching** also matters for doing this meaningfully!



What regularly fills the discretionary spaces in teaching?



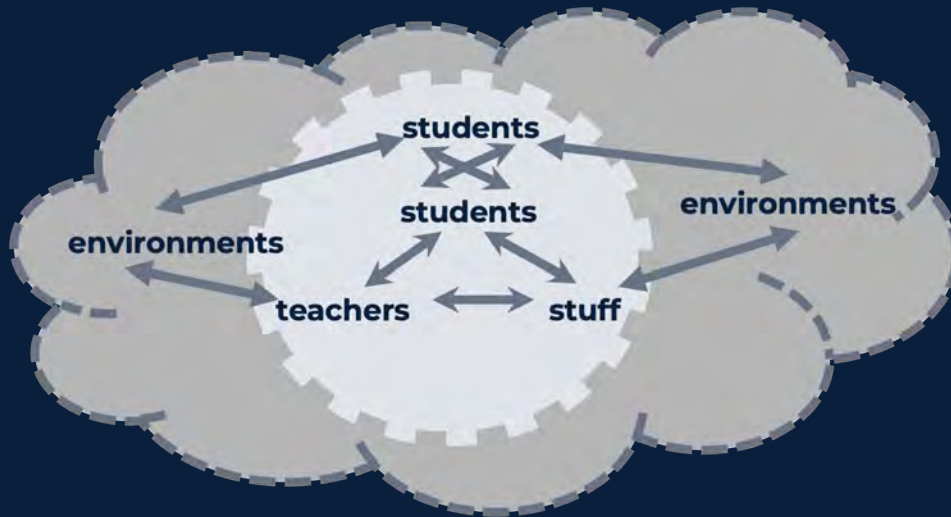
What regularly fills the discretionary spaces in teaching?



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

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

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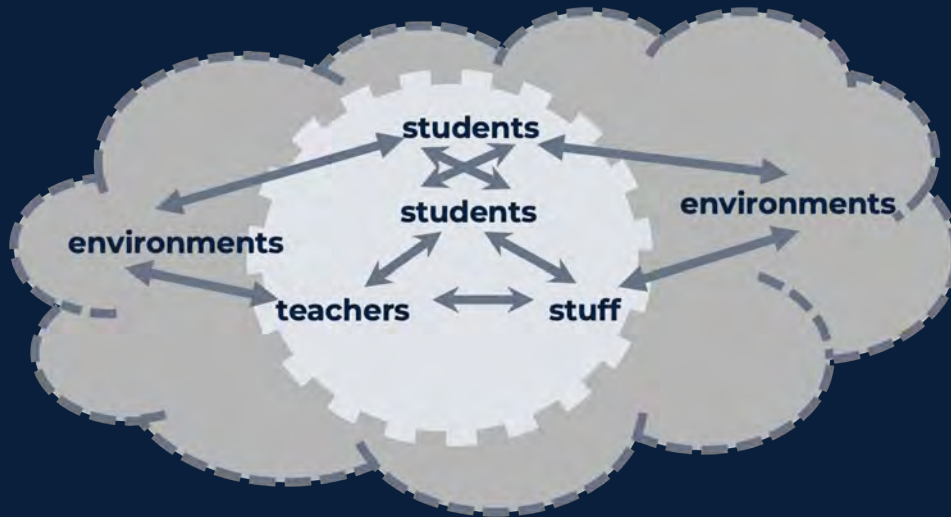


1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schools that institutionalize dominant values and habits.

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.

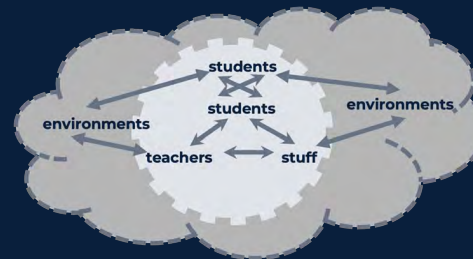


1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schools that institutionalize dominant values and habits.

Professional education and teaching experience often teach these.

Lortie (1975), Banks, Grant and Koskela, Moll
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What does it take to disrupt the patterns that marginalize and reinforce racism?

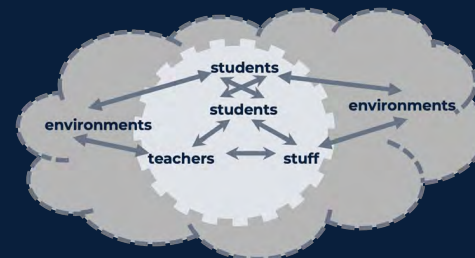


What does it take to disrupt the patterns that marginalize and reinforce racism?



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

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

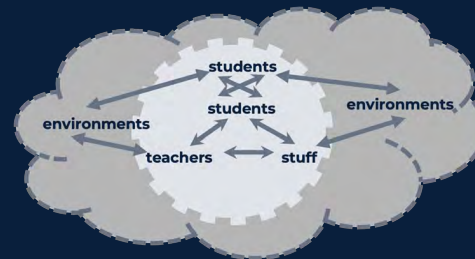


What does it take to disrupt the patterns that marginalize and reinforce racism?



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

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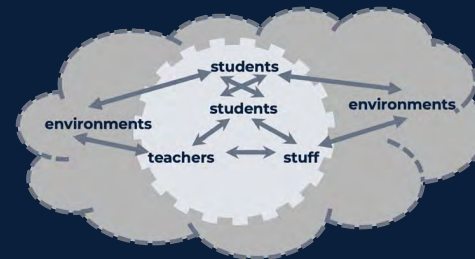


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Knowing and using mathematics in teaching (MKT)

Interpreting Toni as asking a mathematical question that she means

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



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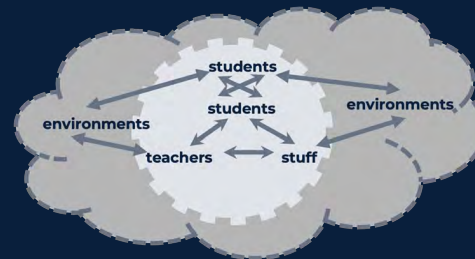


- Seeing Aniyah's explanation and Toni's question as key to the class's work
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- ... AND having something different to DO

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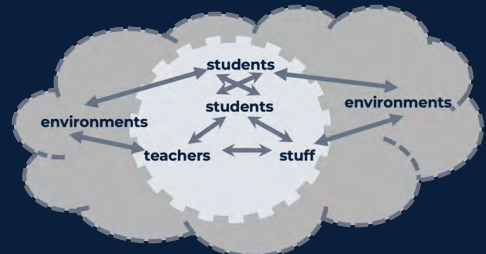


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Knowing and using mathematics in teaching (MKT)

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 is needed to support teachers in advancing the critical work of teaching?

Regular opportunities to:

- Develop the **content understanding** needed for teaching
- Practice listening, seeing, and hearing **students' knowledge**
- Examine our own and others' **practice** (video records)
- Probe and understand the discretionary spaces in **everyday practice**
- Develop repertoires of **new habits** of practice



This is our work.

We have power in our collective efforts to leverage the power of teaching to advance justice in our everyday practice, and to learn, to grow, to share, and to push forward with the fight.



Upcoming programs at TeachingWorks

Registration available now

Learn more at teachingworks.org



1

July 24-28, 2023 at Wayne RESA

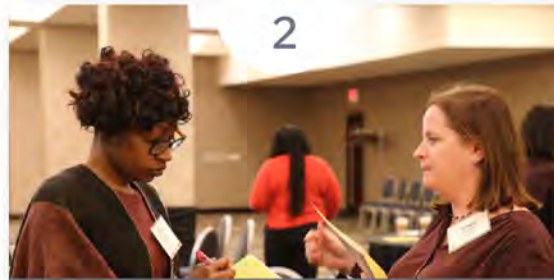
FREE Remote Participation for Early Mathematics Teachers

Elementary Mathematics Laboratory



Explore the complexity of teaching and investigate and challenge what it means to use skillful teaching to disrupt patterns of injustice.

events.gomaisa.org/catalog/eventdetails/1



2

August 2023 in Ann Arbor, MI

Introduction to Practice-Based Teacher Education Workshop



Familiarize yourself with the basic concepts and tools of practice-based teacher education and approaches to teaching instructional practice.

teachingworks.org/pbte-workshop



3

October 2023 in Ann Arbor, MI

Coaching Institute



Unpack and practice the work of coaching and supporting beginning teachers to build your instructional skill in a supportive and dynamic environment.

teachingworks.org/coaching-institute



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THANK YOU!



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Photo from “Mass Incarceration Is Declining — But Not For Women” by Robert P. Alvarez, Institute for Policy Studies.
Retrieved from <https://ips-dc.org/mass-incarceration-is-declining-but-not-for-women/>



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Photo from “Housing cuts would exacerbate inequality” by Laura Mascuch, Kristin Miller, Jolie Milstein, and Barika Williams, *New York Daily News*.
Retrieved from <https://www.nydailynews.com/opinion/ny-oped-housing-cuts-would-exacerbate-inequality-20200623-k2gxn6btrvh6bos6sgwlijokby-story.html>

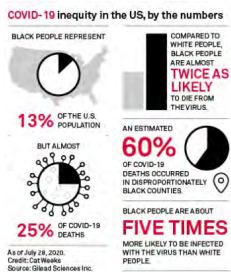


Image on slide 7:
Graphic from “Enough is enough: Gilead-Morehouse study racial, ethnic disparity in COVID-19,” by Michael Gibney, S&P Global Market Intelligence.
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Graphic from “Six policies to reduce economic inequality” by John A. Powell, Othering & Belonging Institute.
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Photo from “On International Day, UN spotlights indigenous peoples' right to education,” United Nations.
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Image on slide 7:
Photo from “UN agrees to urgent debate on racism and police violence,” Deutsche Welle (DW).
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Photo from “Black and Hispanic women, less educated workers among those hardest hit by COVID-19 job losses” by Sara Savat, *The Source*, Washington University in St. Louis.

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Image on slides 15–17:

Photo from “Why You Need an Experienced Real Estate Agent” by Elizabeth Weintraub, *the balance*.

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Image on slides 15–17:

Photo from “Black doctors earn less than white peers, study reveals” by Stacy M. Brown, *The Philadelphia Tribune*.

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Photo from “Want to be a poll worker? Philly says it’s responding to ‘unprecedented’ number of applicants” by Ximena Conde, WHYY
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Image on slides 15–17:
Photo from “Trump Rioters Storm U.S. Capitol (photos),” Variety
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Photo from “20 Classroom Interventions for Children with Anxiety Disorders” by Jerry Kennard, Ph.D., HealthCentral.

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Image on slide 17:

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

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