

# Disrupting Injustice Through Mathematics Teaching that Elevates Students' Brilliance

Deborah Loewenberg Ball

 @deborah\_ball

Council of the Great City Schools

Curriculum, Research, and Instructional Leaders Meeting

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

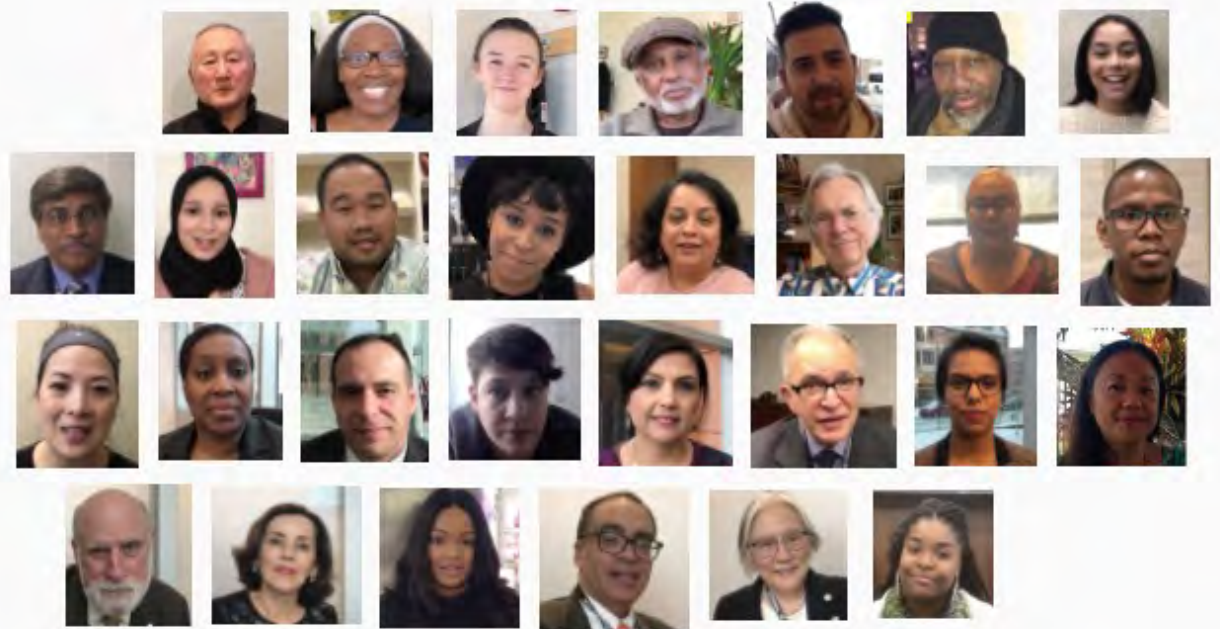
How is teaching powerful?

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

How can we leverage the power of teaching?



# 1. How is teaching powerful?



# 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

BLACK PEOPLE REPRESENT



13% OF THE U.S. POPULATION



25% OF COVID-19 DEATHS

COMPARED TO WHITE PEOPLE, BLACK PEOPLE ARE ALMOST **TWICE AS LIKELY** TO DIE FROM THE VIRUS.

AN ESTIMATED **60%** OF COVID-19 DEATHS OCCURRED IN DISPROPORTIONATELY BLACK COUNTIES.

BLACK PEOPLE ARE ABOUT **FIVE TIMES** MORE LIKELY TO BE INFECTED WITH THE VIRUS THAN WHITE PEOPLE.

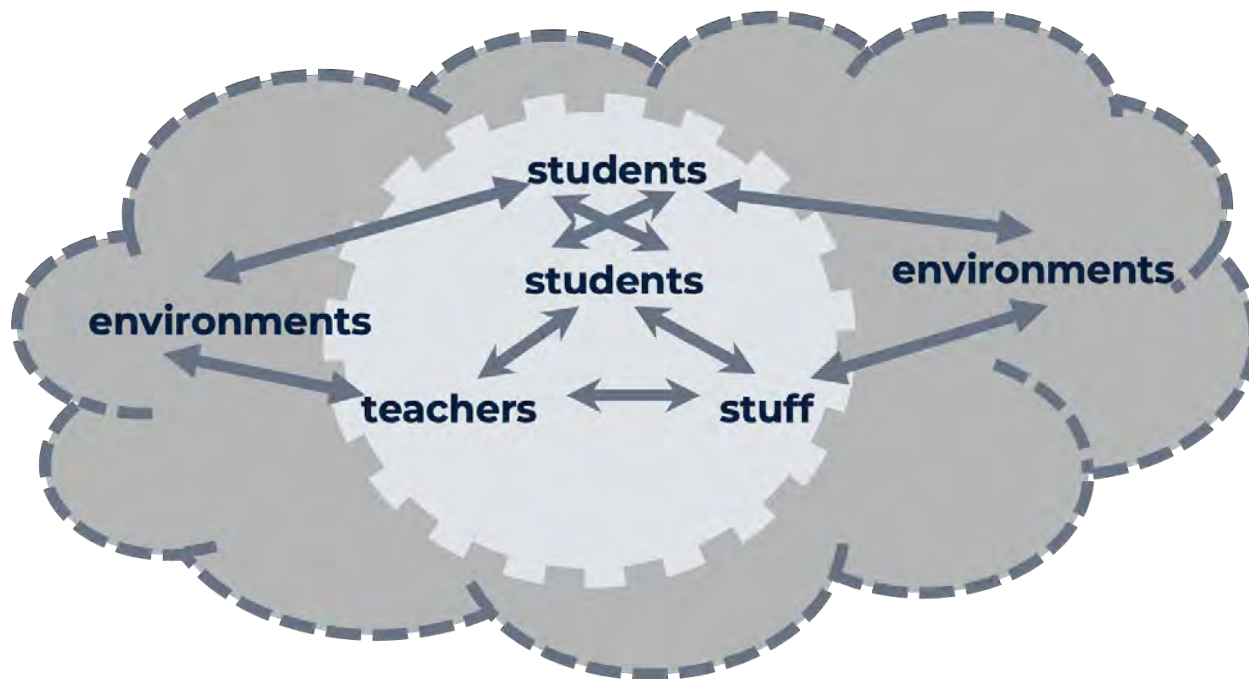
As of July 28, 2020.  
Credit: Cat Weeks  
Source: Gilead Sciences Inc.

# ECONOMIC INEQUALITY



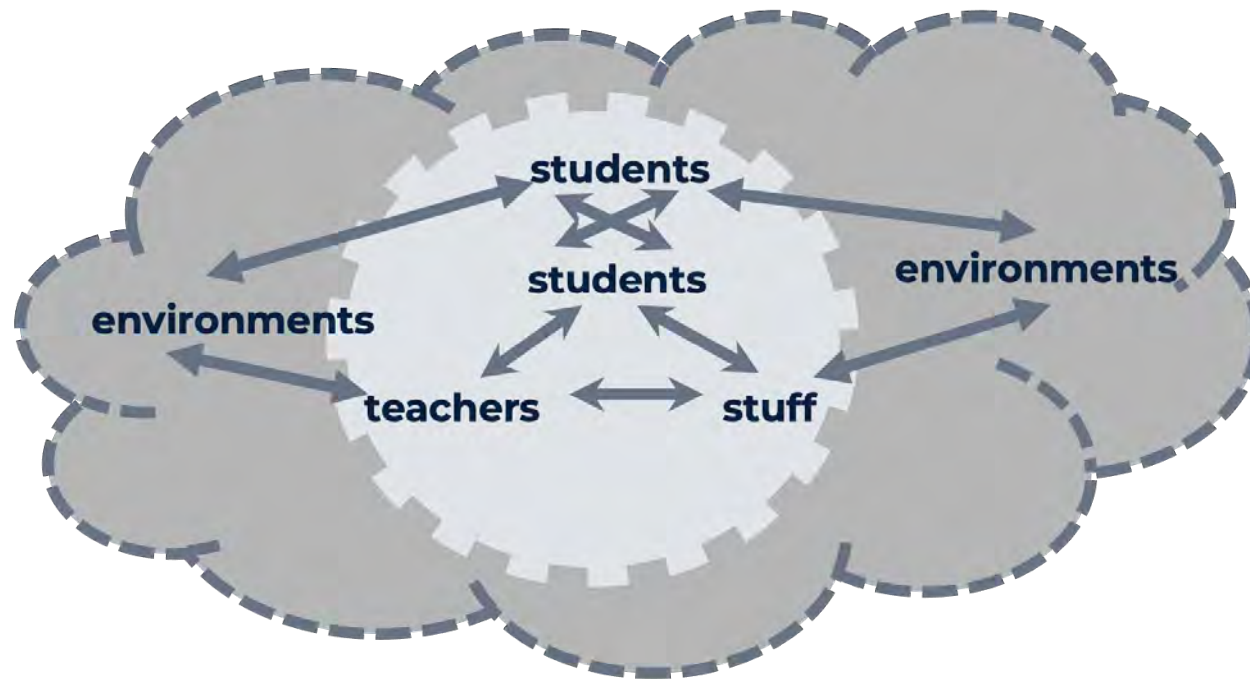
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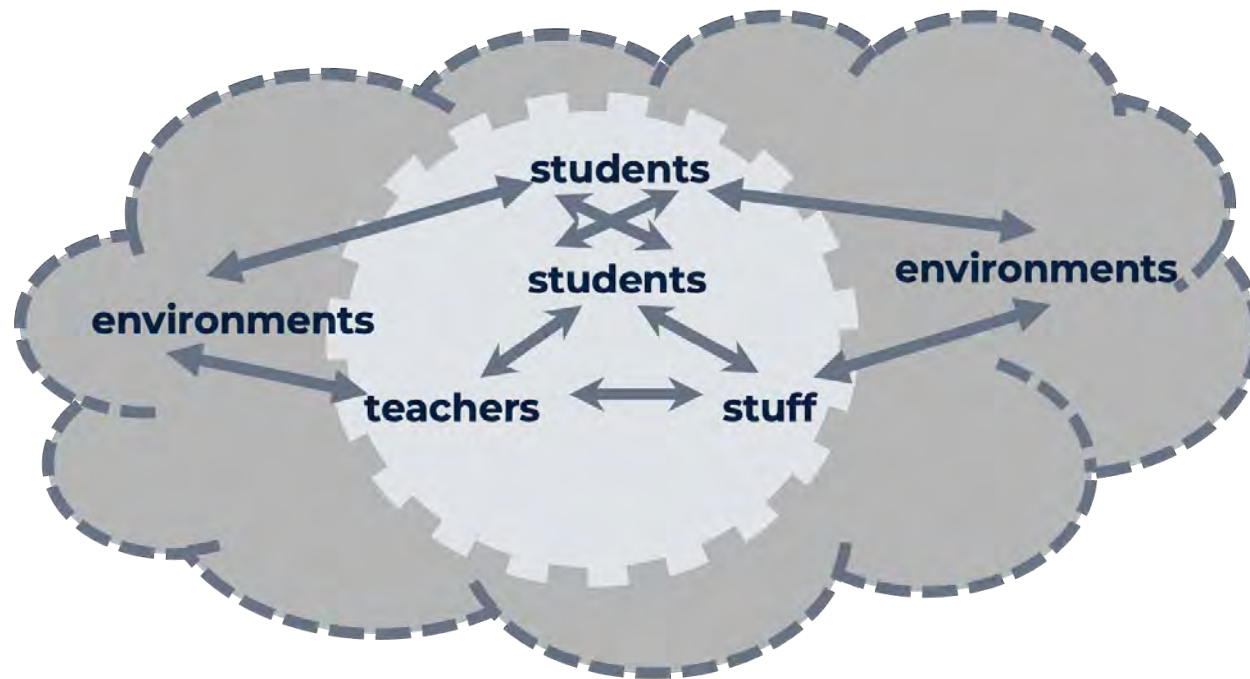




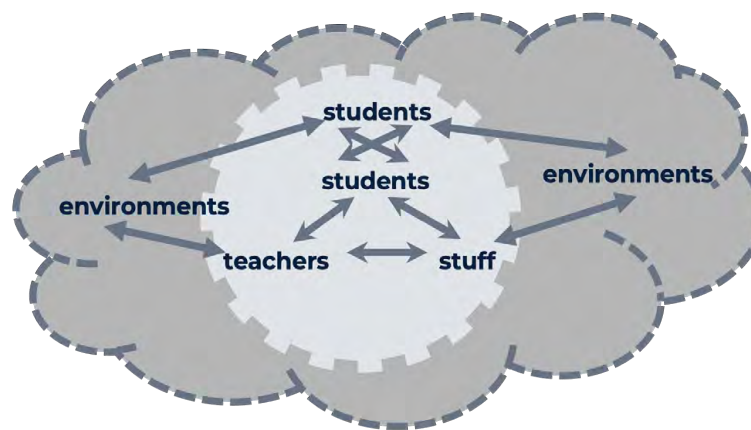
# 1. Teaching and learning are constructed interactively and are interpretive.



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

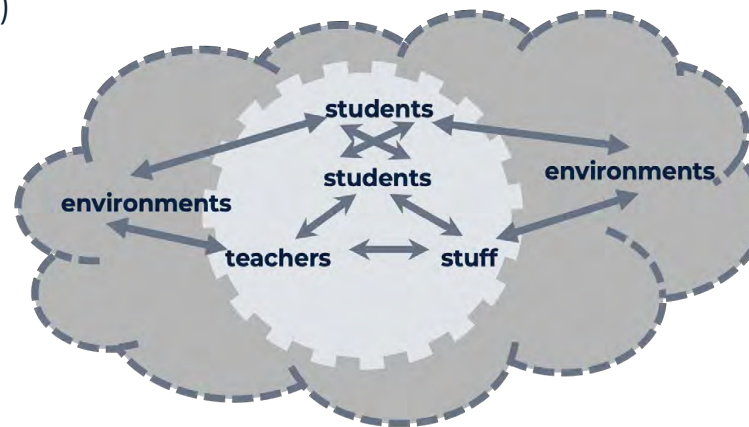


# How do macro level factors interact with everyday practices?



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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)

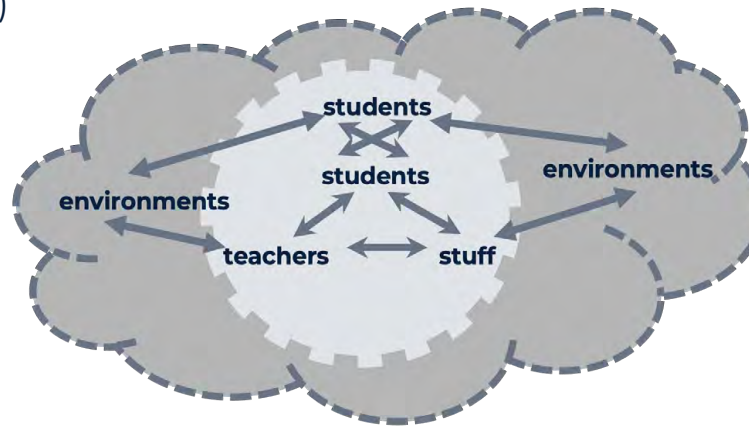


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and

**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)

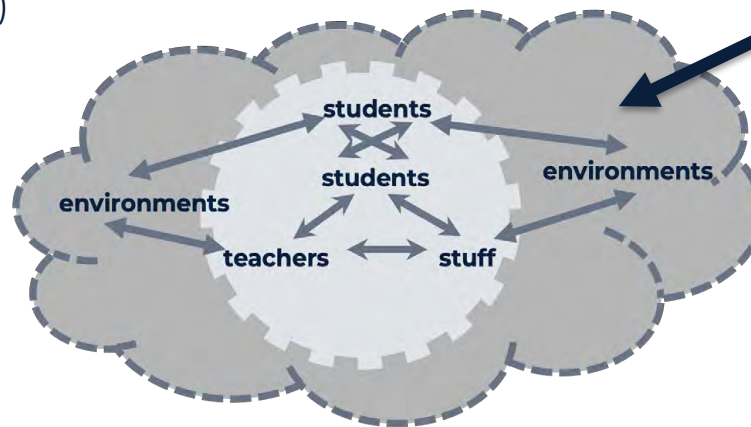


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**Notice that the arrows run both ways.**

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.





**NOTICE:**  
VOTERS ARE REQUIRED TO WEAR MASKS,  
PRACTICE SOCIAL DISTANCING,  
AND BE MINOR 6 FEET FROM OTHER PEOPLE  
IN YOUR COMMUNITY







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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.**

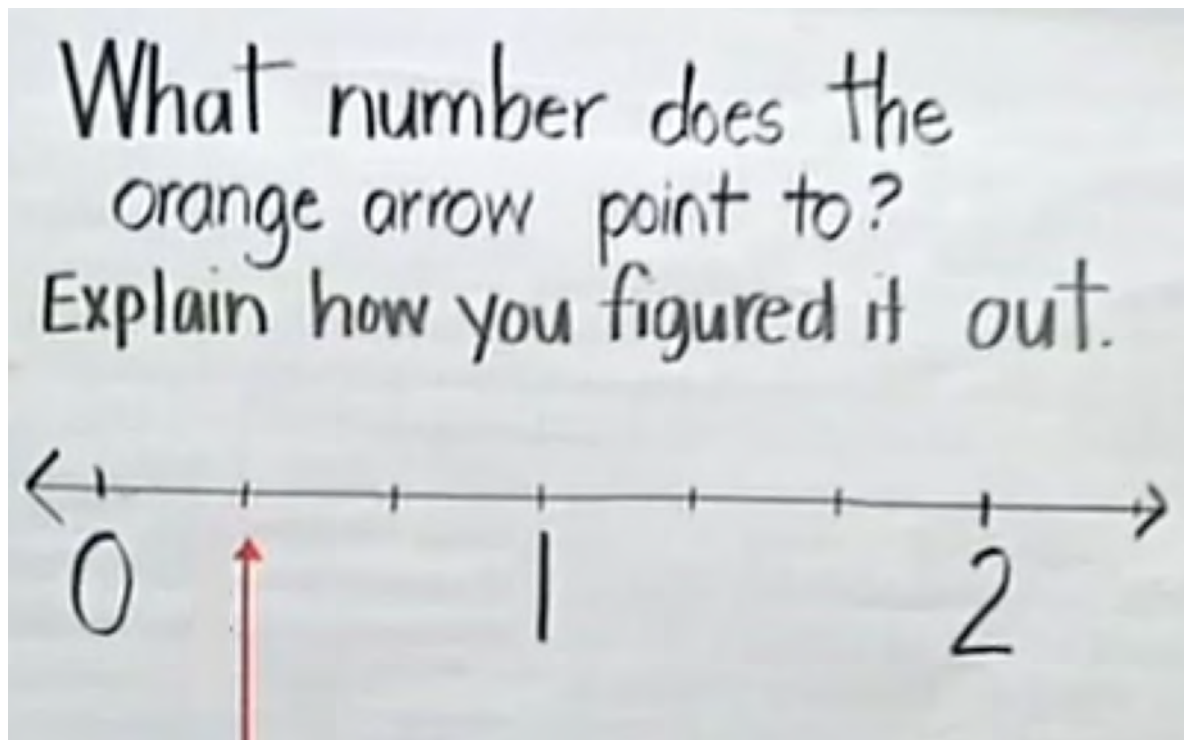
# 3. How can we leverage the power of teaching?



## Fractions as numbers: The instructional goal for student understanding

3.NF.2.a

Represent a fraction  $\frac{1}{b}$  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  $\frac{1}{b}$  and that the endpoint of the part based at 0 locates the number  $\frac{1}{b}$  on the number line.





**Aniyah**



**Toni**



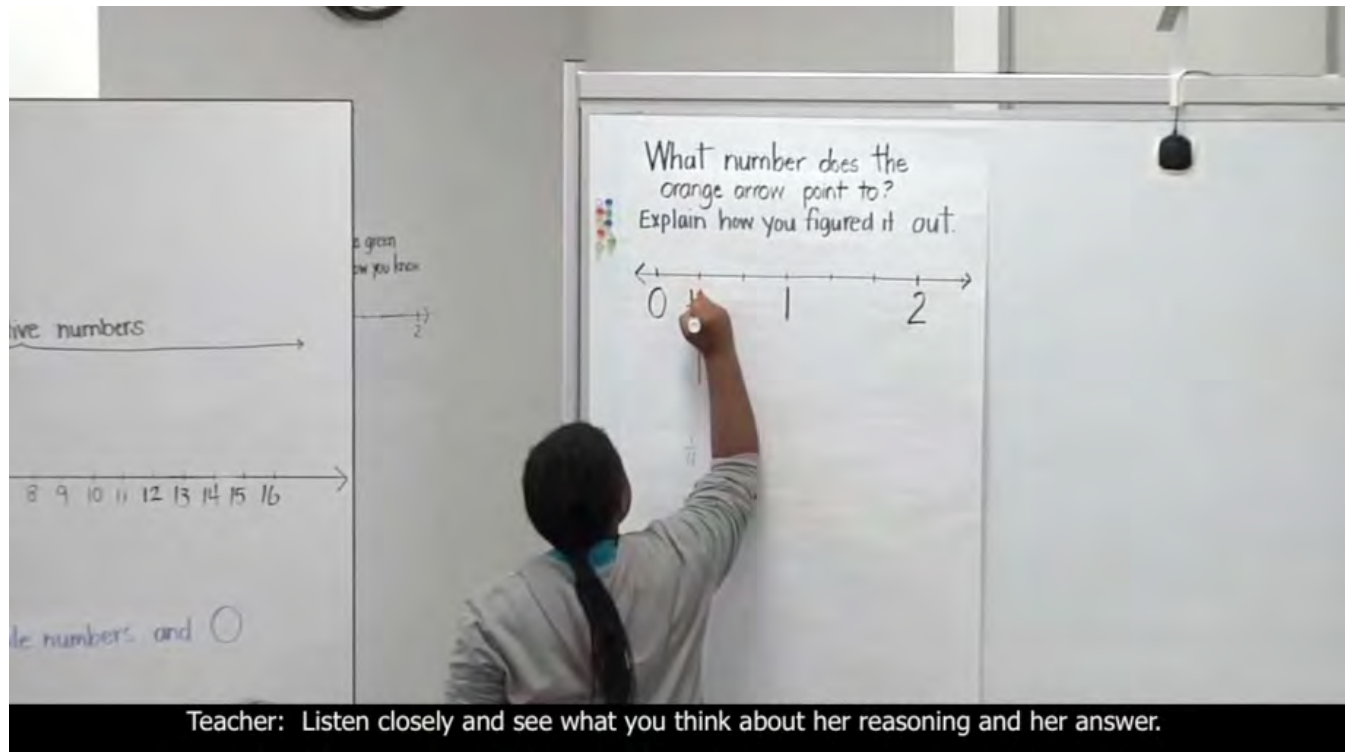
# Viewing focus

**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](#).



Teacher: Listen closely and see what you think about her reasoning and her answer.



# 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?

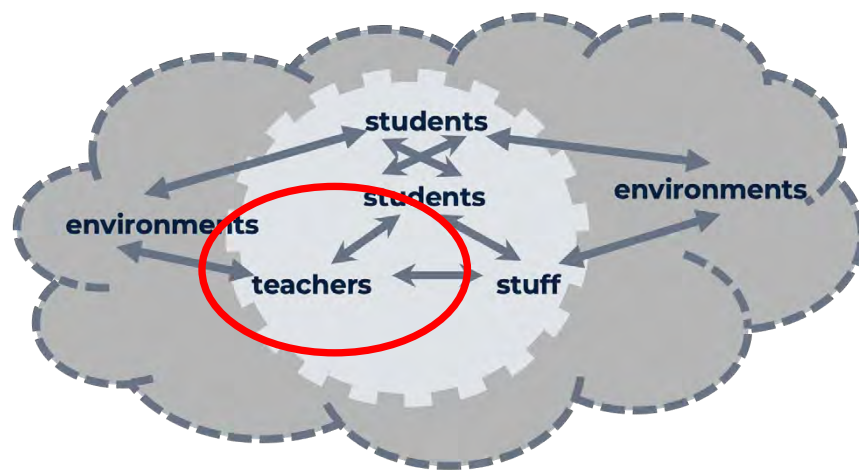
## NORMALIZED NEXT MOVES

- “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.”

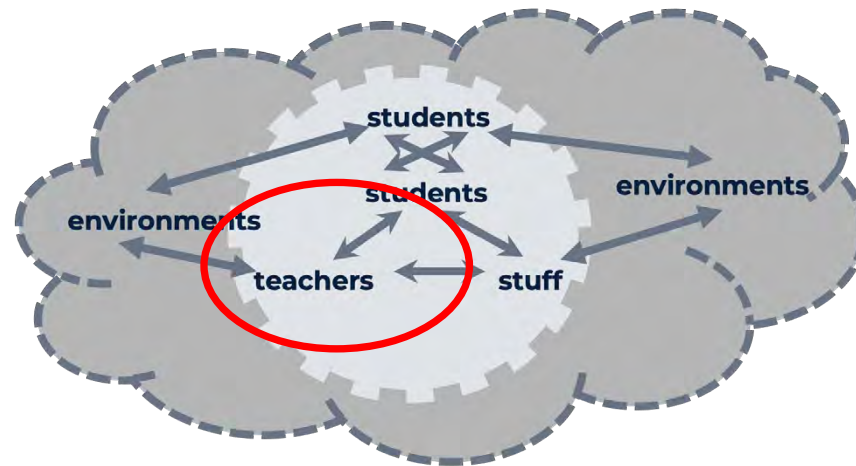
## RESULTS

- 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.

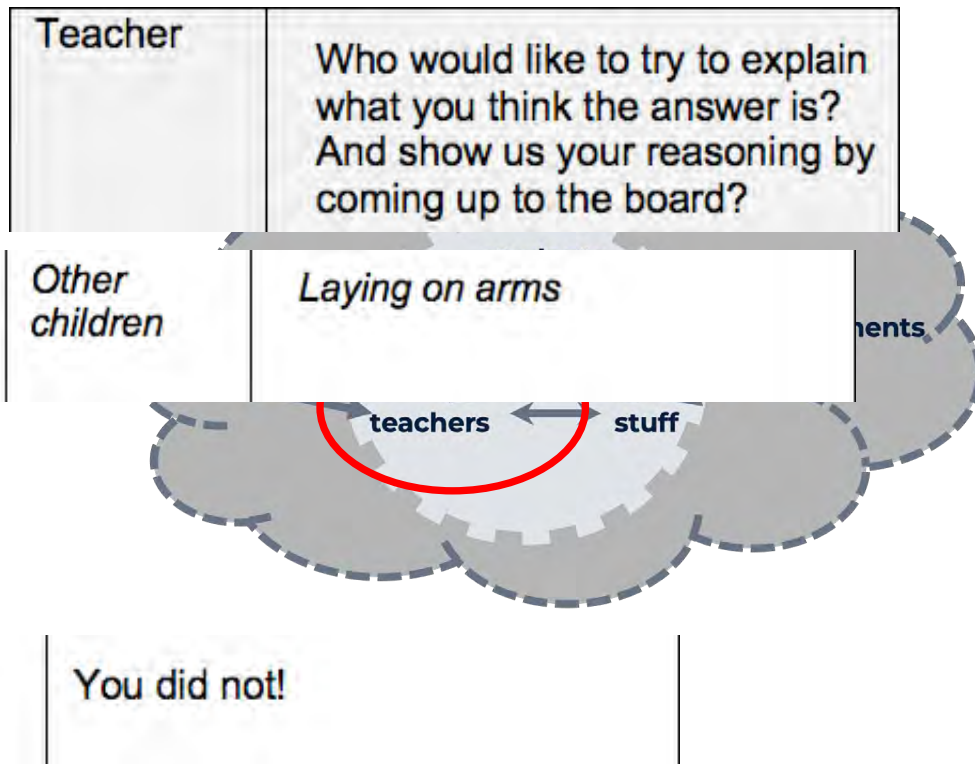




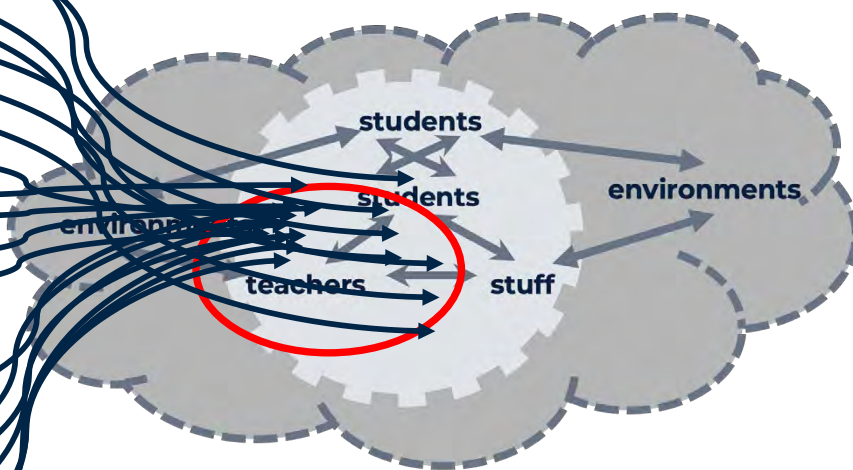
Speaker	Talk	Discretionary space
Teacher	Who would like to try to explain what you think the answer is? And show us your reasoning by coming up to the board?  Who'd like to come up to the board and try to tell-  And you know, it might not be right. That's okay because we're learning something new.  I'd 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?	
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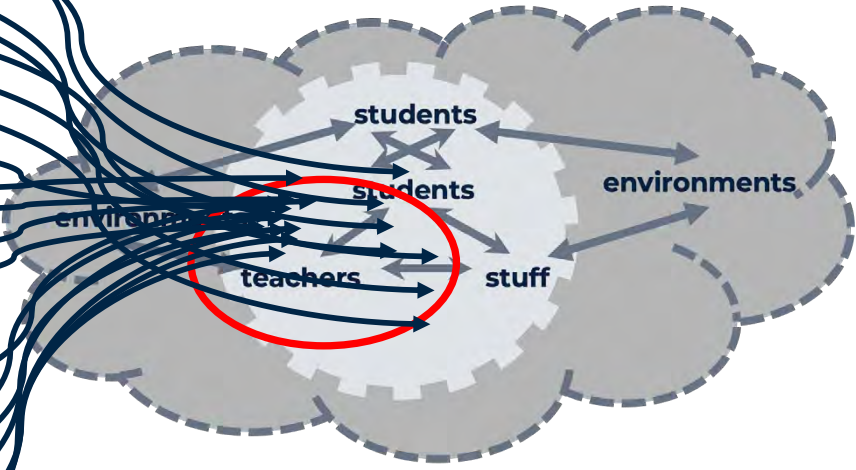
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20 in 1:28

# Teaching is dense with “discretionary spaces”

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20 in 1:28

## Video: Aniyah and Toni



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# 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.

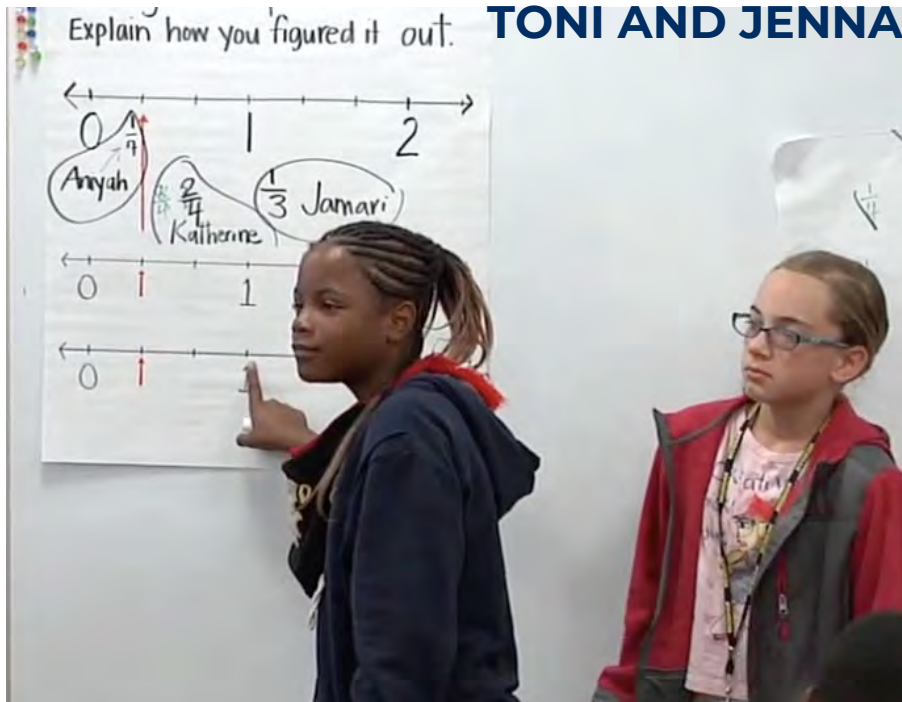


- Other children hear Aniyah as getting the discussion going, and Toni as asking an important mathematical question.
- Aniyah and Toni are both positioned as contributing to the discussion.
- Children see a teacher attending to Black girls as mathematical thinkers and contributors to collective work.



- 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 ( $2/5$ ) 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.

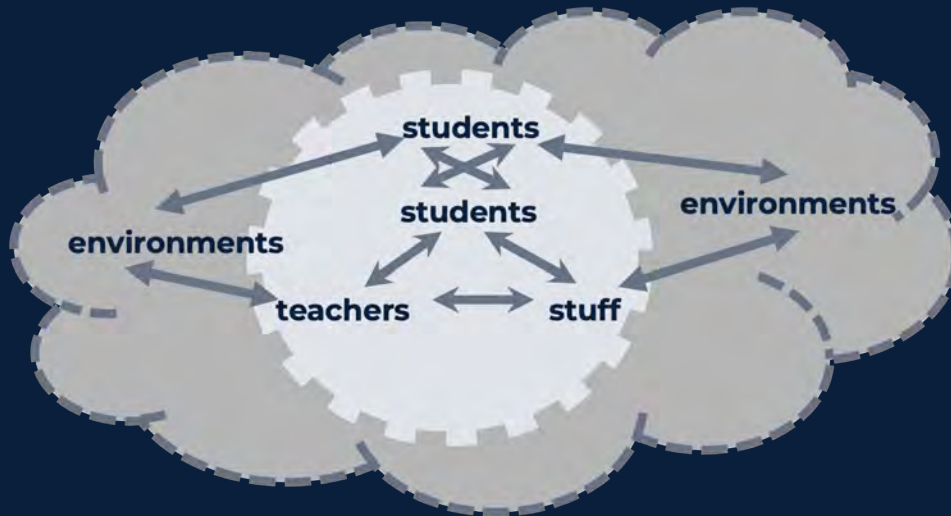
Understanding **content knowledge for teaching** also matters for doing this meaningfully!



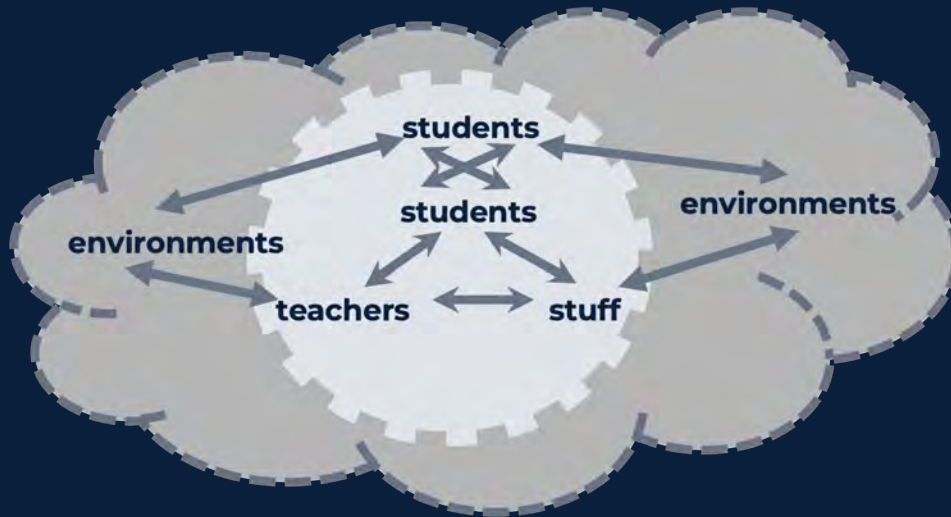
What would it take to learn to use the discretionary spaces in teaching in ways that disrupt white supremacy, instead of reinforcing and perpetuating it?



# What regularly fills the discretionary spaces in teaching?



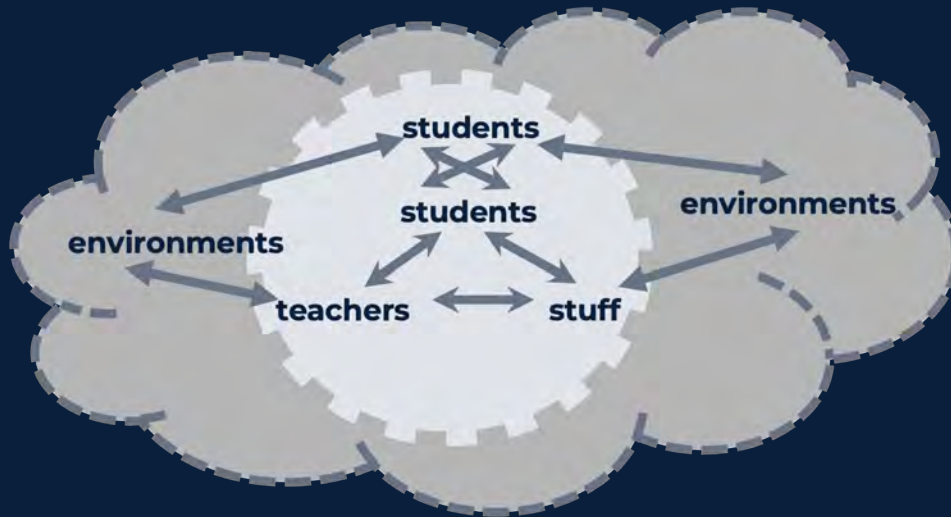
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1. Teachers' experiences in a society filled with racism and oppression.

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

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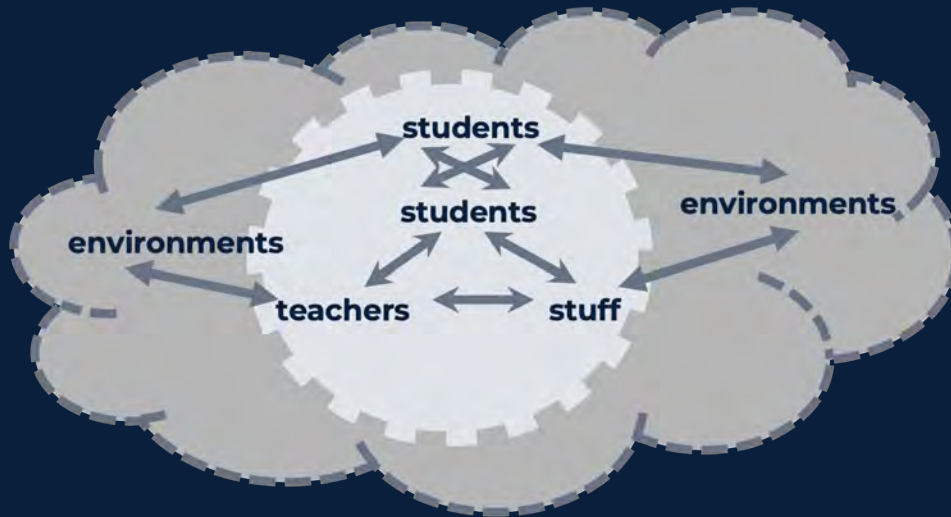


1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schools that institutionalize dominant values and habits.

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.



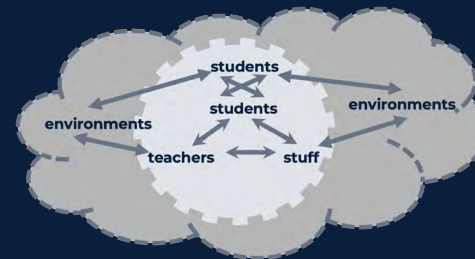
1. Teachers' experiences in a society filled with racism and oppression.
2. Normalized practices in schools that institutionalize dominant values and habits.

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?

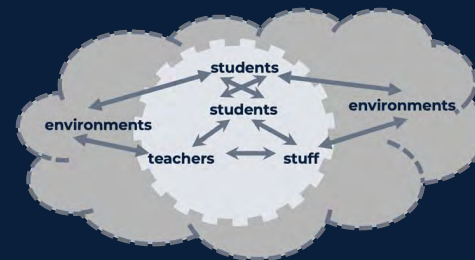


# What does it take to disrupt the patterns that marginalize and reinforce racism?



- 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

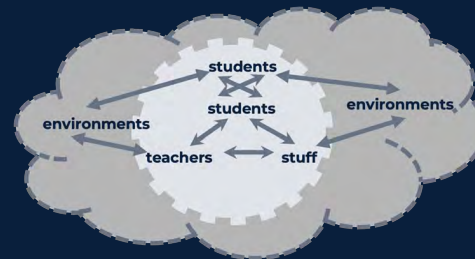


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- Seeing Aniyah's explanation and Toni's question as key to the class's work
- Taking as axiomatic the brilliance of Black children, and thus Toni and Aniyah

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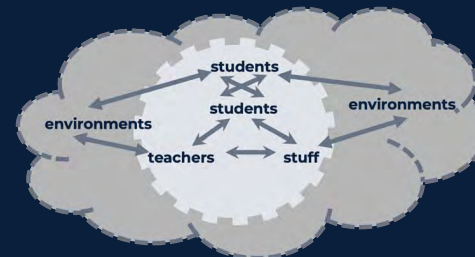
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Knowing and using mathematics in teaching (MKT)

Interpreting Toni as asking a mathematical question that she means



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



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

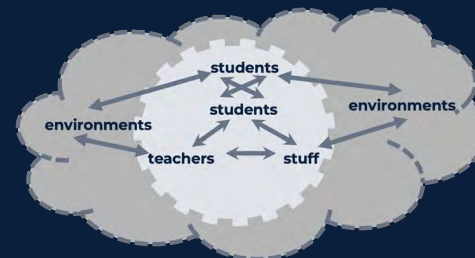


- Seeing Aniyah's explanation and Toni's question as key to the class's work
- Taking as axiomatic the brilliance of Black children, and thus Toni and Aniyah
- ... AND having something different to DO

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



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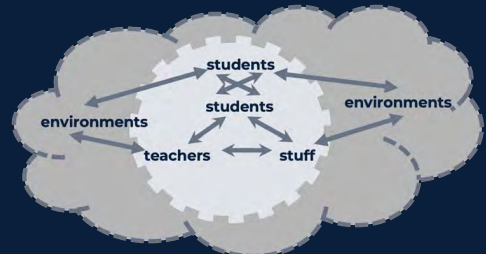


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Knowing and using mathematics in teaching (MKT)

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 are some  
specific  
inclusive  
practices to  
disrupt  
common  
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1. Broadening what it means to “participate”
2. Acknowledging competence
3. Reframing “error”

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# “Positioning” theory

A theory from social psychology, originated by Bronwyn Davies and Rom Harré

Focuses on how discursive and other moves in social interactions and situations set up how people are seen, interpreted, and how people experience and feel themselves to be seen interpreted, and how they experience their sense of self in that context.

Davies, B. & Harré, R. (1990). Positioning: The discursive production of selves. *The Journal of Social Behavior*, 20(1) 43–63.



# Acknowledging competence

Deliberately deploying power to:

1. Broaden and label what being competent (“smart”) in a given context means
2. Intervene to position who (and what) is seen as competent in that context
3. Support positive individual identities and self-positioning

Sources: E. Cohen and R. Lotan, complex instruction; J. Boaler’s work; *Smarter Together: Collaboration and Equity in the Elementary Mathematics Classroom* (Featherstone, Crespo, et al., 2011)



## What does “acknowledging competence” require?

1. Having a broad understanding of the content or domain oneself
2. Using the concept of “positioning” to intervene to influence who (and what) is seen as competent
3. Strategically making these moves in authentic and well-timed ways; having ways to do that that are sensitive



# Distinguishing acknowledging competence from praise

## Praise

- “Good job!”
- “You’re working so well today.”
- “Nice work!”
- “I am proud of you.”
- “You’re working like such good mathematicians.”
- “You made so much progress on the problems today.”

**Praise** – verbal feedback with the purpose of evaluating what a student says or does

**Acknowledging competence** – intentional identifying, naming, and highlighting specific mathematical or learning competencies of what a student says or does

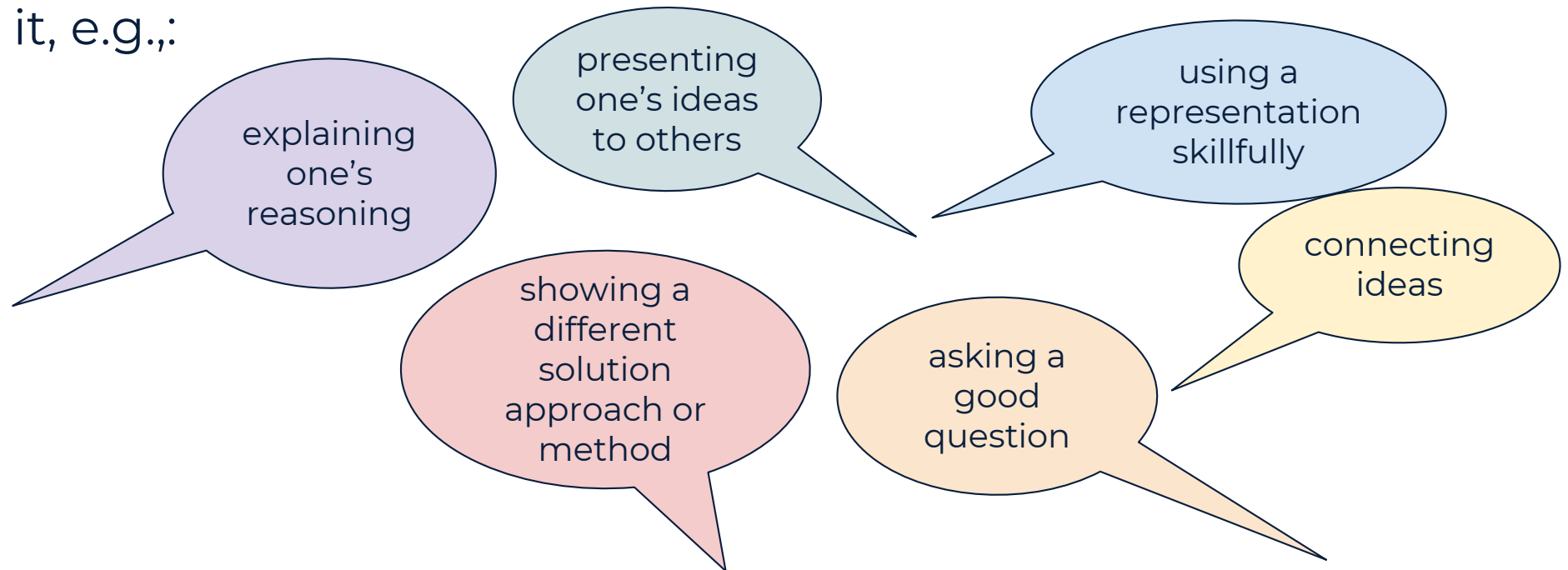
## Acknowledging competence

- ★ “It was particularly clear how you used your drawing to explain your thinking.”
- ★ “Belin gave a clear and specific mathematical explanation.”
- ★ “You solved that in a really interesting way. Can you tell us more about your thinking?”
- ★ “Ibn used a very interesting method to show that there are no more solutions. Who can say what Ibn did?”
- ★ “It is clear how closely you are following other people’s thinking and connecting it to the idea you had.”
- ★ “One thing that was really important about what Laken did was to use the definition we developed.”



## Practicing acknowledging competence

Identify **specific examples** of mathematics learning competence and **what you might say** to acknowledge it, e.g.,:



# Acknowledging competence is a disruptive practice

Disrupting patterns of:

- Narrow, reductive, and distorted views of mathematics
- “Under-teaching”
- Who is seen as mathematically competent
- Negative and deficit views students carry of themselves



## What is involved in acknowledging competence?

1. Recognizing and broadening conceptions of what comprises mathematics and mathematical competence, and seeing that in children
2. Understanding the broader systemic factors that shape everyday micro-interactions related to racism and other forms of oppression (sexism, linguicism, ableism, classism) and seeing risks and status hierarchies in one's own class.
3. **Based on #1 and #2, intervening explicitly to acknowledge particular students' competence.**



## Two possible ways to acknowledge competence

1. You could name a specific competence that a particular student displayed in something they did or said and why that is important in doing math.
2. You could ask the class what a particular student did that is a really important thing to do in doing math and what is valuable about that.

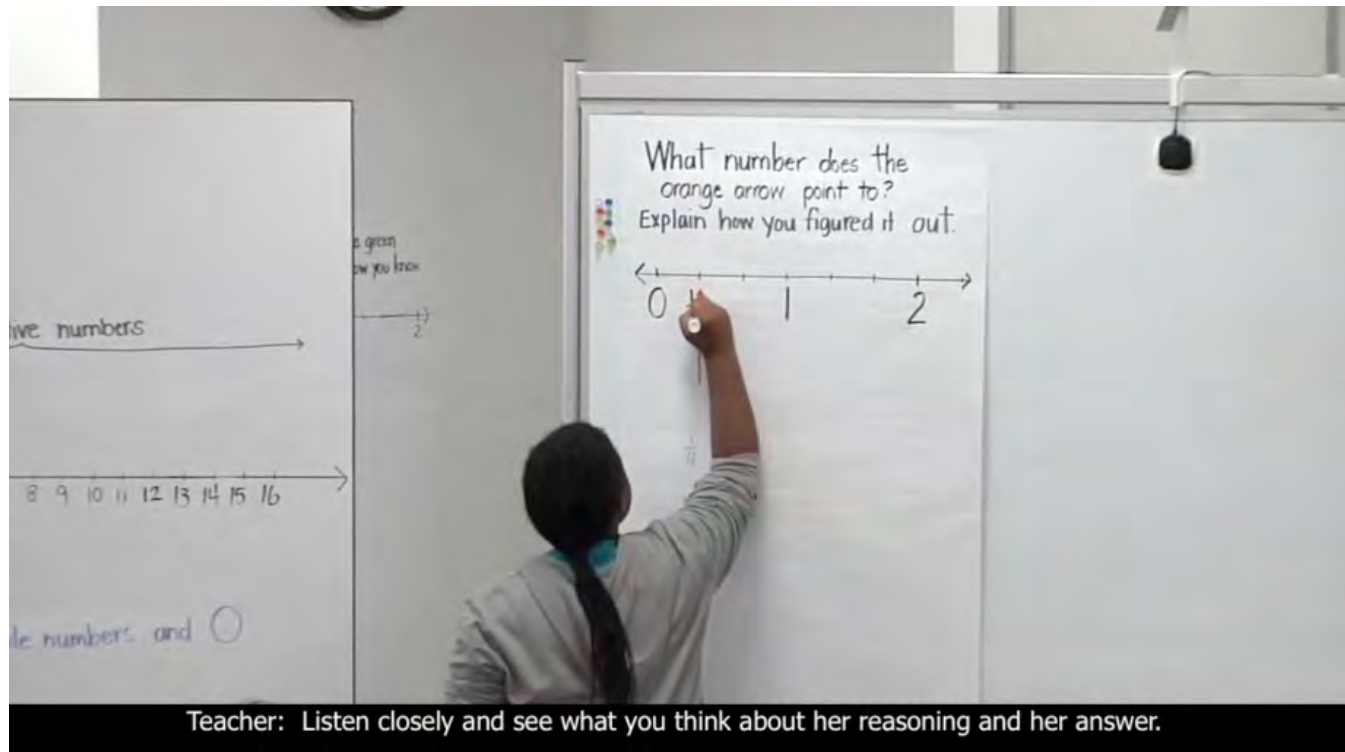
Remember to be broadening conceptions of math and mathematical competence.

*Other possibilities exist. We'll start with these.*





## Video: Aniyah and Toni



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

# Practice

1. What competences would you acknowledge here?
2. Whom would you choose to acknowledge and why?
3. What would you actually say?



What will be valued in one's own context and not inadvertently cause harm? What could land in ways that reinforce instead of disrupt patterns of racism and other forms of oppression?



# 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 their 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.



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Virtual Participation Available

### Elementary Mathematics Laboratory



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

[teachingworks.org/eml](https://teachingworks.org/eml)

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](https://teachingworks.org/pbte-workshop)

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**October 2023 in Ann Arbor, MI**

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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](https://teachingworks.org/coaching-institute)

**Promo code: TWCGCS**



# THANK YOU!



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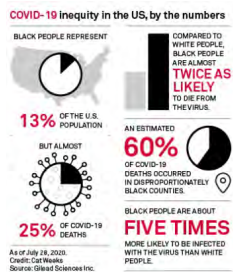


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