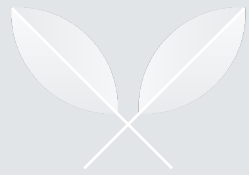


Centering Student Voice and Discourse



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Zachary Champagne

October 27, 2023

NCTM Annual Conference



Where do you find joy in the teaching
and/or learning of mathematics?



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Why student voice and discourse?



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The Progression of Our Thinking and Learning

How do we make math class less teacher driven?

How do we ask the right questions?

How do we get kids to talk?

How do we help teachers listen?

How do we help kids talk and listen to each other?



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Questions We've Been Asking Ourselves

Is it worth talking about?

Who has mathematical authority and agency?

What structural routines are in place to support conversation?

What type of communication is valued or privileged?

How is the room and/or students organized?



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Is it Worth Talking About?

Rich Tasks

(Three Act Tasks, Estimation 180, Estimysteries, etc.)

Pedagogical Routines

(Which One Doesn't Belong, Notice/Wonder, How Many?, Number Talks, etc.)

Is it Interesting?

(the math, the context, the image, etc.)

Comparing Solution Strategies



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Which One Doesn't Belong?

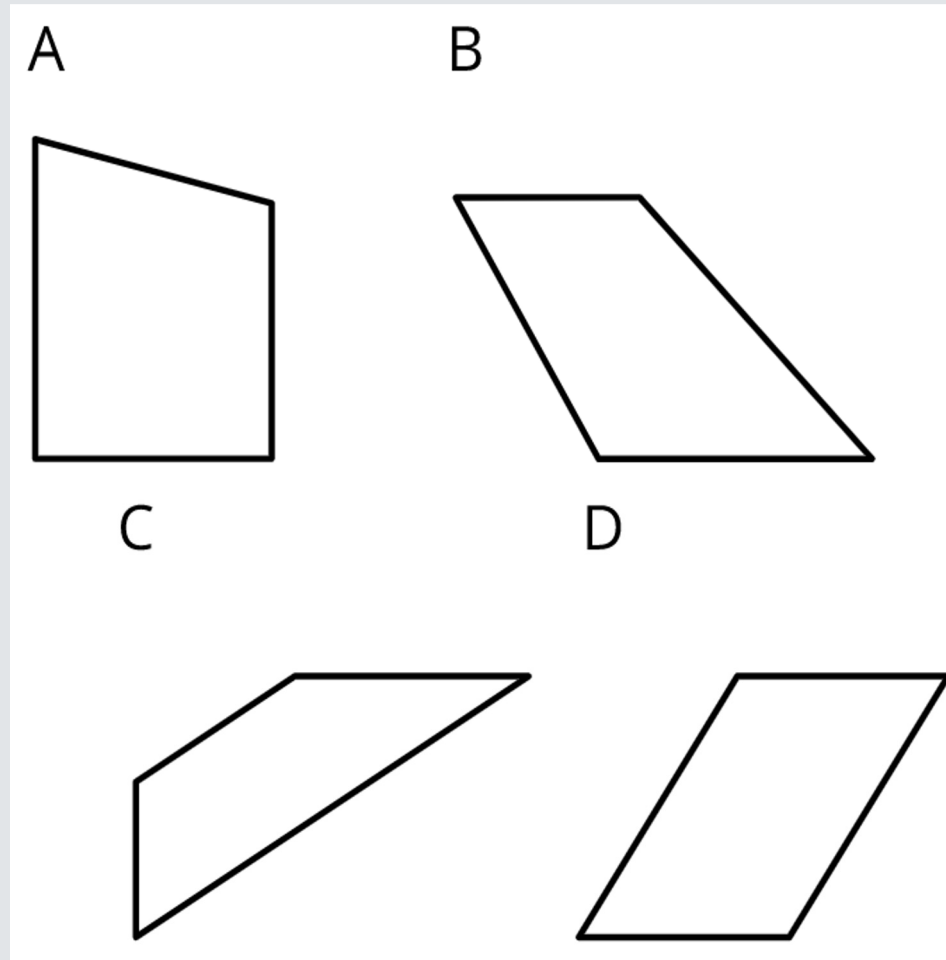


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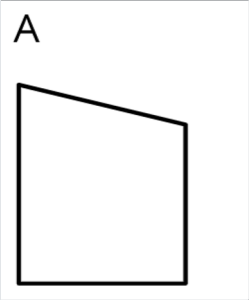


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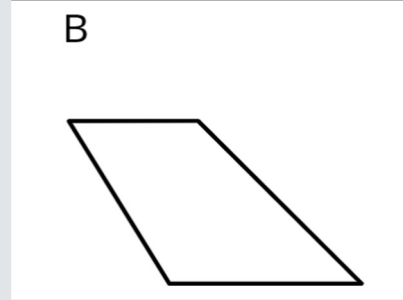
Which One Doesn't Belong?



Which One Doesn't Belong?



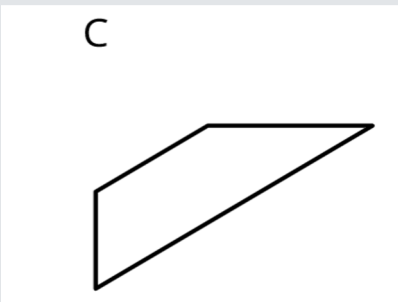
“Not a flat top”



“Tilted to the left”

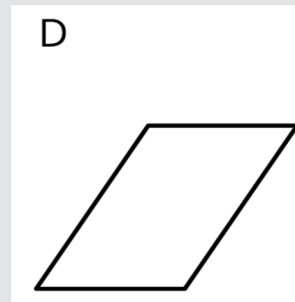
“Right is more slanted than the left”

“Corners more smashed”



“Most slanted”

“Least rectangular”



“Most normal”



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When we add OUR words to a kid's idea,
are we sending the message that the way
they said it isn't correct?



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When we add OUR words to a kid's idea,
are we sending the message that the way
they said it isn't correct?

Or even worse, are we ignoring that at times
their language is in fact better than ours?"



Dr. Barbara Blanke and Kimberly Kelly

“Remember that someone’s ideas
are a part of who they are.”



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Comparing Two Strategies

Number Talk

$119 + 119$

$139 + 139$

$199 + 199$



Comparing Two Strategies

4 Voz fuerte
3 Voz alta
2 Voz normal
1 Sussura
0 Silencio

238

$$\begin{array}{r} 119 + 119 \\ \hline \text{Emerson } (238) \\ 9 + 9 = 18 \rightarrow 38 \\ 10 + 10 = 20 \rightarrow 238 \\ 100 + 100 = 200 \end{array}$$

Cody

$$\begin{array}{r} 120 + 120 = 240 \\ 119 + 119 = 238 \end{array} \rightarrow -2$$

Ruby (238)

$$\begin{array}{r} 9 + 9 = 18 \rightarrow 38 \\ 10 \times 2 = 20 \\ 100 \times 2 = 200 \end{array}$$

139 + 139

$$\begin{array}{r} \text{Enzo} \\ 100 + 100 = 200 \\ 30 + 30 = 60 \rightarrow 260 \\ 9 + 9 = 18 \rightarrow 278 \end{array}$$


Liam

$$\begin{array}{r} 130 + 130 = 260 \\ 9 + 9 = 18 \rightarrow 278 \end{array}$$

Cody (278)

$$\begin{array}{r} 140 + 140 = 280 \\ 139 + 139 = 278 \end{array}$$

PIZARRA



NEVER STOP LET SOMEONE STOP YOU FROM BEING YOURSELF

We are all better because you are here.♡

kindness MATTER

we open our minds and hearts so we can discover the knowledge

Every single device "going to" 11 beacons.



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Comparing Two Strategies

Liam
 $130 + 130 = 260$
 $9 + 9 = 18$ $\rightarrow 278$

Cody 278
 $140 + 140 = 280$
 $139 + 139 = 278$ \downarrow

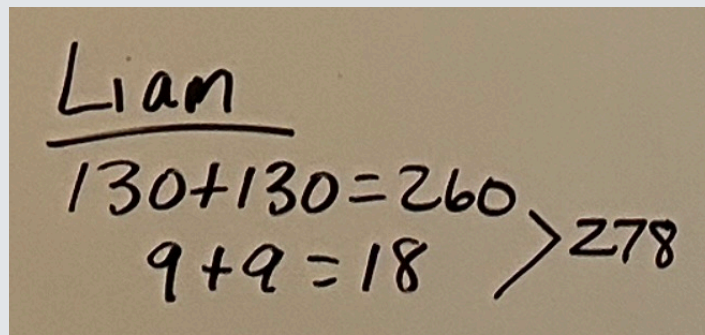


Comparing Two Strategies

Liam: I was gonna do what Enzo did, but I could do two steps at the same time. So, I did $130 + 130$, then I doubled the 9s.

Mr. Zak: How did you get 278?

Liam: I put them together.



Liam

$$\begin{array}{l} 130 + 130 = 260 \\ 9 + 9 = 18 \end{array} \rightarrow 278$$

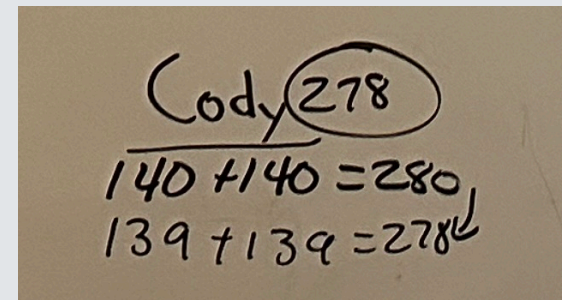
Cody: I went up to 140 and doubled it to get 280. Then I had to go back 2.

Mr. Zak: Why did you go back 2?

Cody: Ummmm...I don't really know.

Mr. Zak: Where do you see the 2 you went back?

Cody: I don't know, I just did it.



Cody 278

$$\begin{array}{l} 140 + 140 = 280 \\ 280 - 2 = 278 \end{array}$$





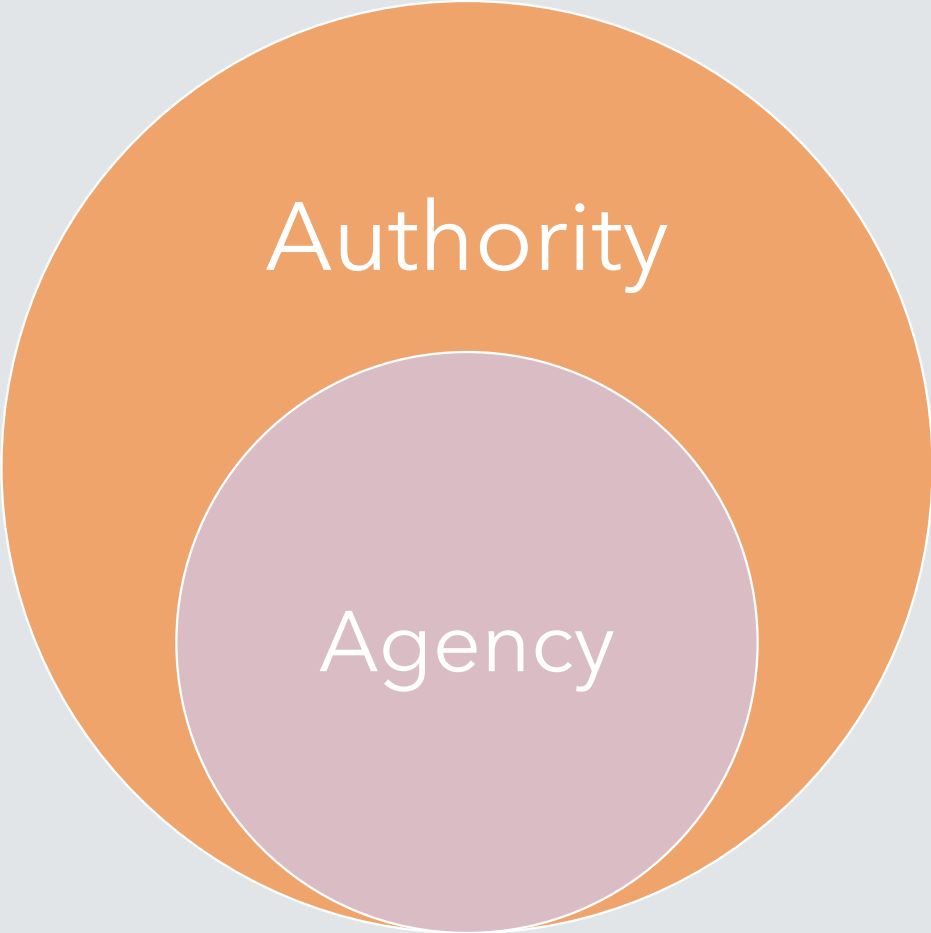
Who Has Mathematical Authority and Agency?



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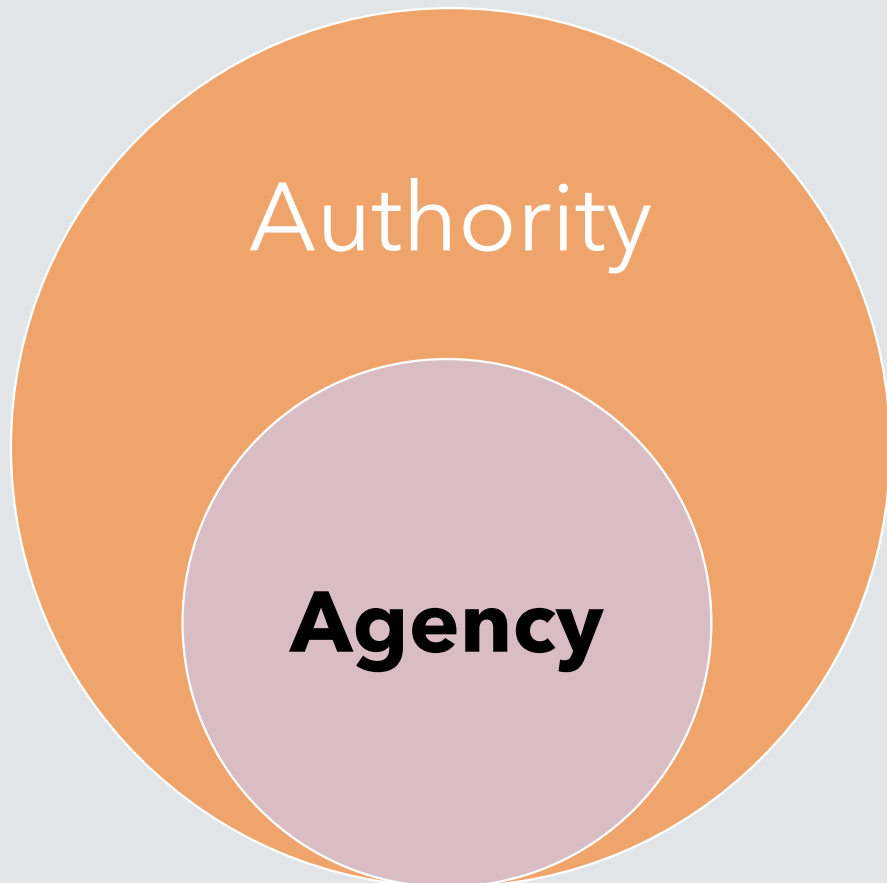
Who is deemed capable of making mathematical contributions?



- Who is involved in deciding the legitimacy of mathematical ideas?
- To whom are students accountable?
- Who is deemed as a competent sense-maker?
- Who decides the ways in which students can engage with mathematics?



Who has the capacity to act? And in what ways can they act?




- How much choice do students have?
- What types of choices are students making?
- Who decides how mathematical problems are solved?



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In classrooms where students **don't** experience authority and agency, their talk is often focused on proving their worth and how much they know.

In classrooms where students **do** experience authority and agency, students view talk as an opportunity to support their own learning and the learning of the class.



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What do you notice about the mathematical authority and agency in this classroom?



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Who Has Mathematical Authority and Agency?



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Video Courtesy of University of Michigan



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What do you notice about the mathematical authority and agency in this classroom?



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What Structural Routines are in Place to Support Conversation?

Random and Sustained Partnerships

Sentence Stems

Wait Times 1 and 2

Quiet Think Time

Turn and Talk

Gallery Walks



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What's resonating
with you?



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Thank you!



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