

DISRUPTING PATTERNS OF INEQUITY: WHAT DOES IT TAKE TO LEARN TO SEE, HEAR, AND CALL OUT CHILDREN'S COMPETENCE?

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OUR NATION, AND OUR FUTURE

- There are 78,000,000 people under the age of 18 in our country.
- Almost 25% of the nation's population.
- 50,000,000 are in schools (1.3 million homeless).

How can we teach mathematics so that people stop hating and killing one another?

- Adapted from Maisha Winn, inspired by Ihab Hassan

All this talk about not focusing
on children's deficits—why
does this matter so much?
Isn't our job to figure out what
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All this talk about not focusing on children's deficits—why does this matter so much? Isn't our job to figure out what children don't know and help them grow?

1. Learning occurs through a process of building on prior knowledge and experience.
2. Strong academic identities are a means to developing competence. They are also instructional goals.
3. For children of historically marginalized groups, stereotype threat and other biases interfere with and impede children's performance.

All this talk about not focusing on children's deficits—why does this matter so much? Isn't our job to figure out what children don't know and help them grow?

So—focusing on children's strengths is crucial for effective and equitable instruction and for advancing social justice.

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3. For children of historically marginalized groups, stereotype threat and other biases interfere with and impede children's performance.

Okay, I see why this is important. But it isn't easy. How do I learn to be more skillful at recognizing and using children's strengths?

MY CHOICE OF VIDEO SEGMENTS FOR THIS SESSION

- Non-professional video (“home video quality”)
- My own teaching, but why?
- Diverse classrooms: race, ethnicity, language, SES
- Useful for the specific goals of this session: to learn to see and use children’s resources
- Situated in the case of school mathematics

WHY MATHEMATICS IN THIS SESSION?

- Mathematics is a domain that has historically excluded groups of people, disproportionately people of color and women.
- This has left these people:
 - feeling “not good at math” and even “not smart.”
 - without access to experience the beauty and power of mathematics.
 - outside the construction and development of the field.
 - barred from their desired fields and paths.



THEREFORE—

WHY MATHEMATICS IN THIS SESSION?

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 - barred from their desired fields and paths.
- Mathematics is also a domain ripe for disrupting marginalization, and what it means to be “smart” and who is smart.
- Mathematics can be a highly democratic domain with broad free access.
- Mathematics would expand and change if currently marginalized groups were actively participating in it as a field.

STORY #1

CONNECTING WITH VIRSHAWN



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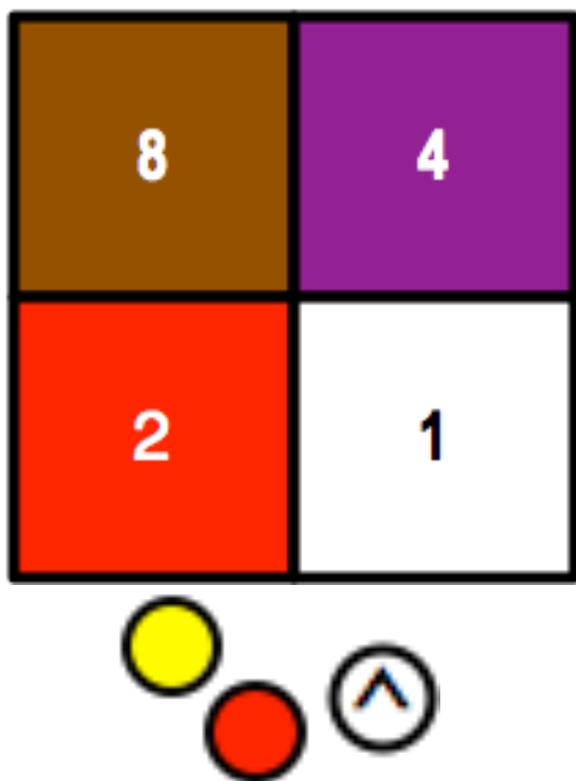
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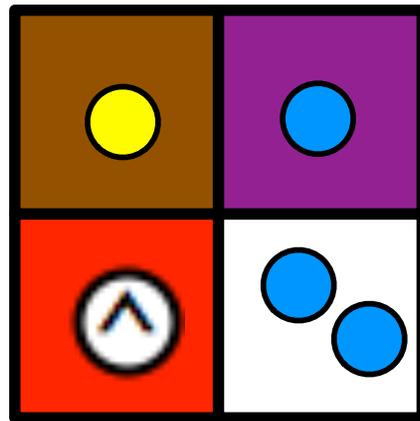
THE MINICOMPUTER



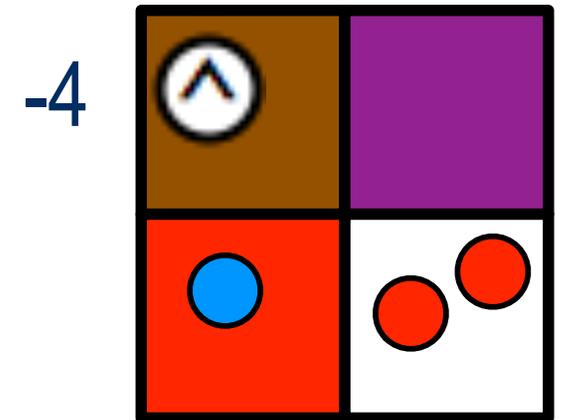
(Papy Minicomputer)

- Abstract mathematical context for work on number relationships, mathematical structure, arithmetic properties (e.g., distributive property), even and odd numbers
- Also a setting for developing skills of mathematical argument and analysis, as well as proof
- Novel and complex mathematical environment for children

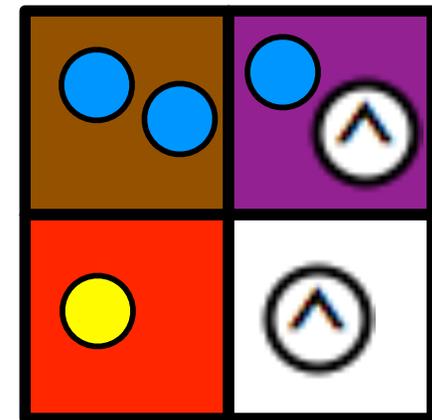
THE MINICOMPUTER



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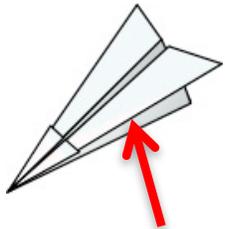
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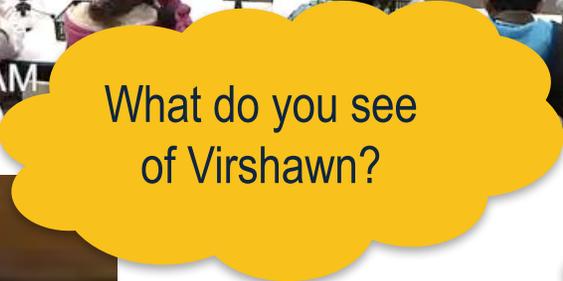
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SEEING VIRSHAWN

Virshawn between
11:19 – 11:25



Paper airplane



At 11:26, the teacher says, “You know what, Virshawn, I am going to need you to come up here closer where you can see and hear and won’t be distracted.”



Over the next minute,
Virshawn is raising his
hand to answer
questions.

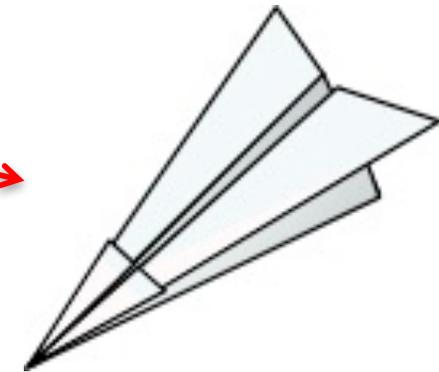
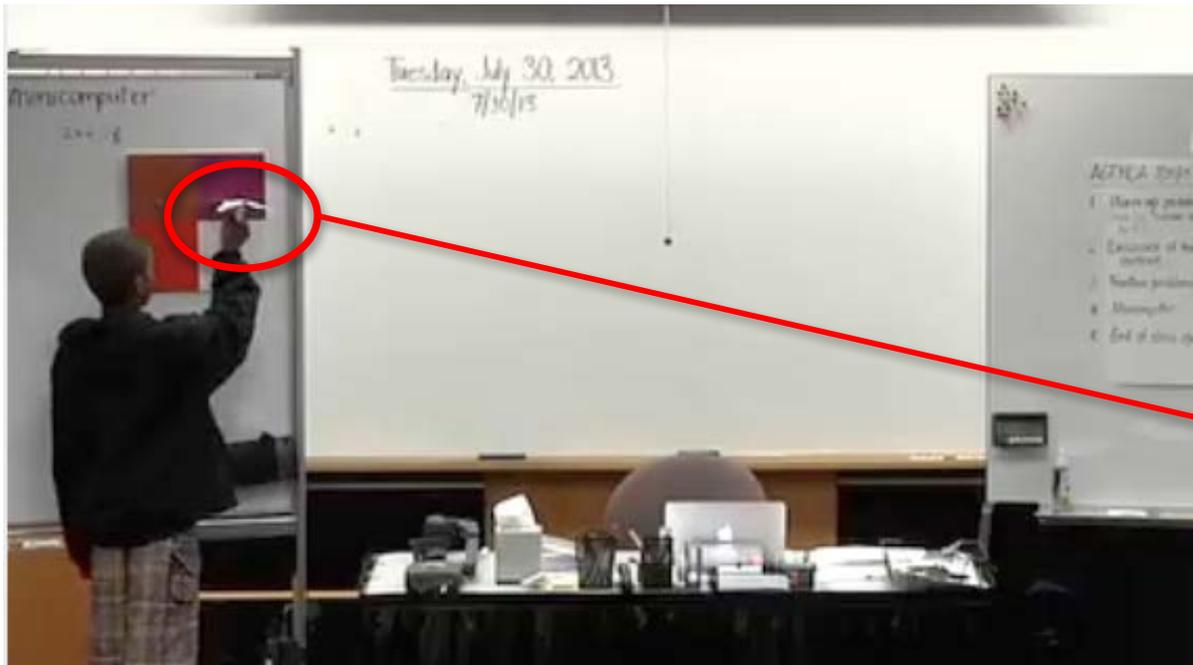


At 11:27, the teacher says,
“Virshawn, you get to come
up and make a number
because you are the closest
person to the board.”

“You can have two checkers
and you can put them
wherever you want, and
make a number, and then
you can call on somebody.”



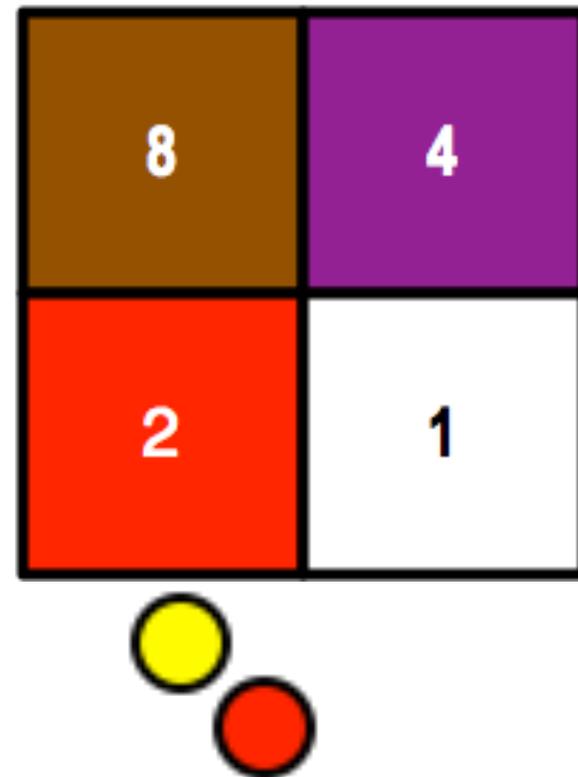
AT 11:28, VIRSHAWN TAKES THE ROLE OF THE TEACHER



VIRSHAWN, ONE WEEK LATER

THE TWO-CHECKER PROBLEM

What numbers are possible to make on the Minicomputer with exactly two positive checkers?



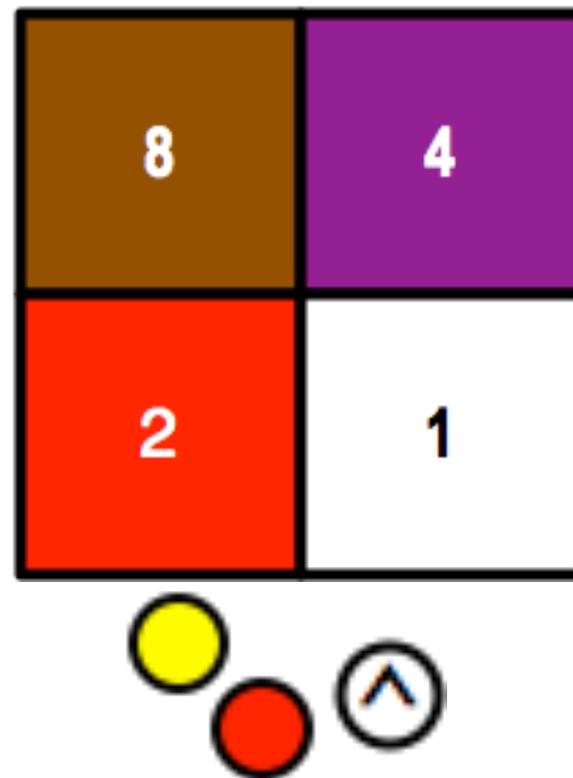
ADDING A NEGATIVE CHECKER!

The children found that 7, 11, 13, 14, and 15 were impossible with exactly two checkers.

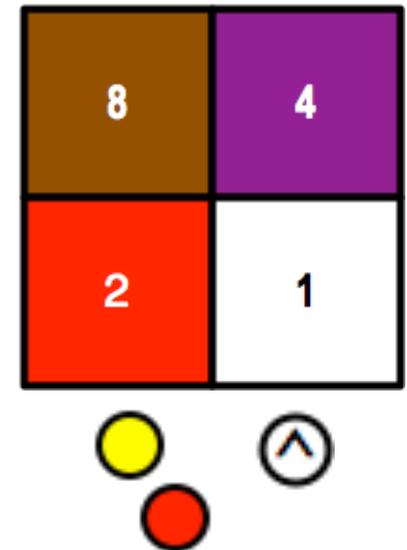
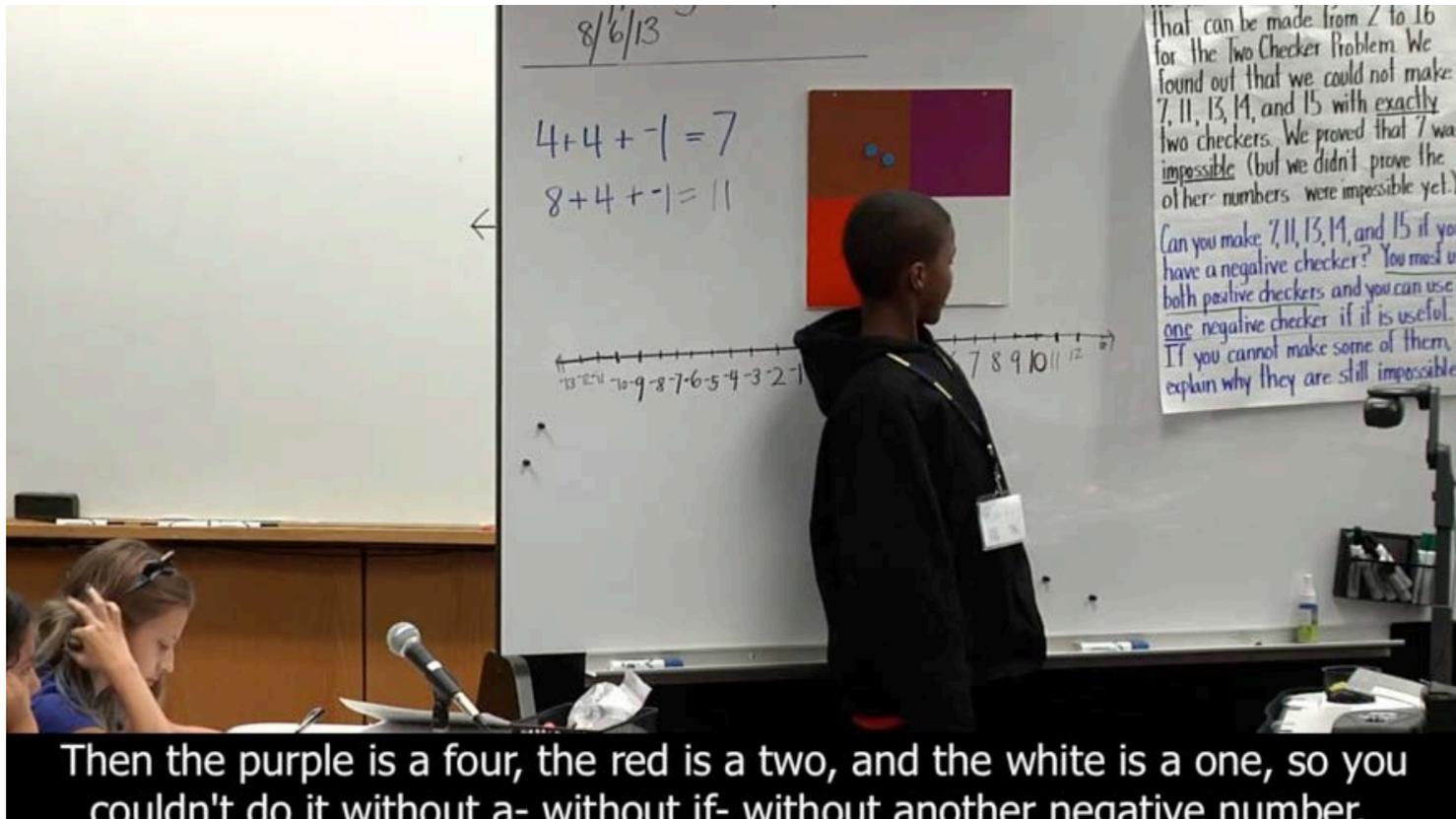
EXTENSION:

Can you make 7, 11, 13, 14, and 15 if you have a negative checker?

You must use both positive checkers and you can use one negative checker if it is useful.



VIDEO: HOW DOES THIS DAY RELATE TO WHAT HAPPENED ONE WEEK EARLIER?



I think the negative checker is Awesome

WHAT IS THE WORK OF SEEING AND BUILDING ON VIRSHAWN'S STRENGTHS IN THIS EXAMPLE?

- Trusting Virshawn to be mathematically engaged
- Making explicit positive mathematical roles that actively include and support children (e.g., “being the teacher”)
- Creating opportunities to “practice mathematics”
- Making available an opportunity to develop agency through “proving the impossible”
- Focusing on mathematics as a context for positive roles and identity

INTERMEDIA

HOW DO WE SHIFT OUR ORIENTATION
TO MATH AND TO YOUNG PEOPLE, IN
ORDER TO HELP THEM GROW ?



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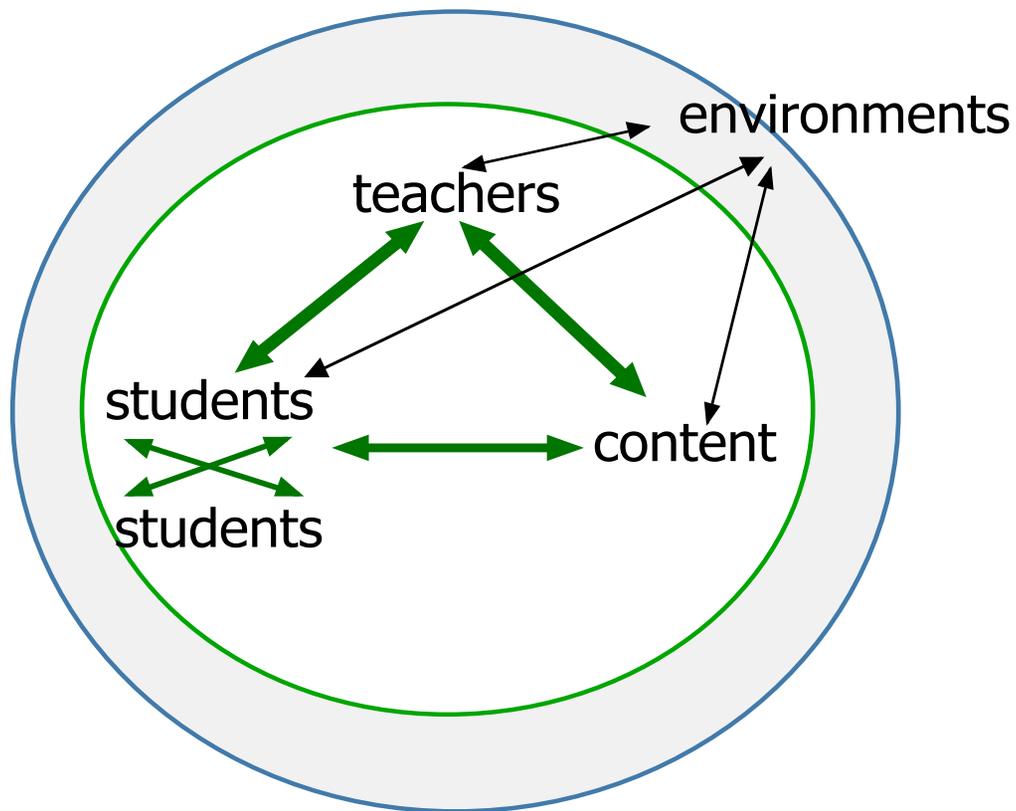
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WHAT IS INSTRUCTION?

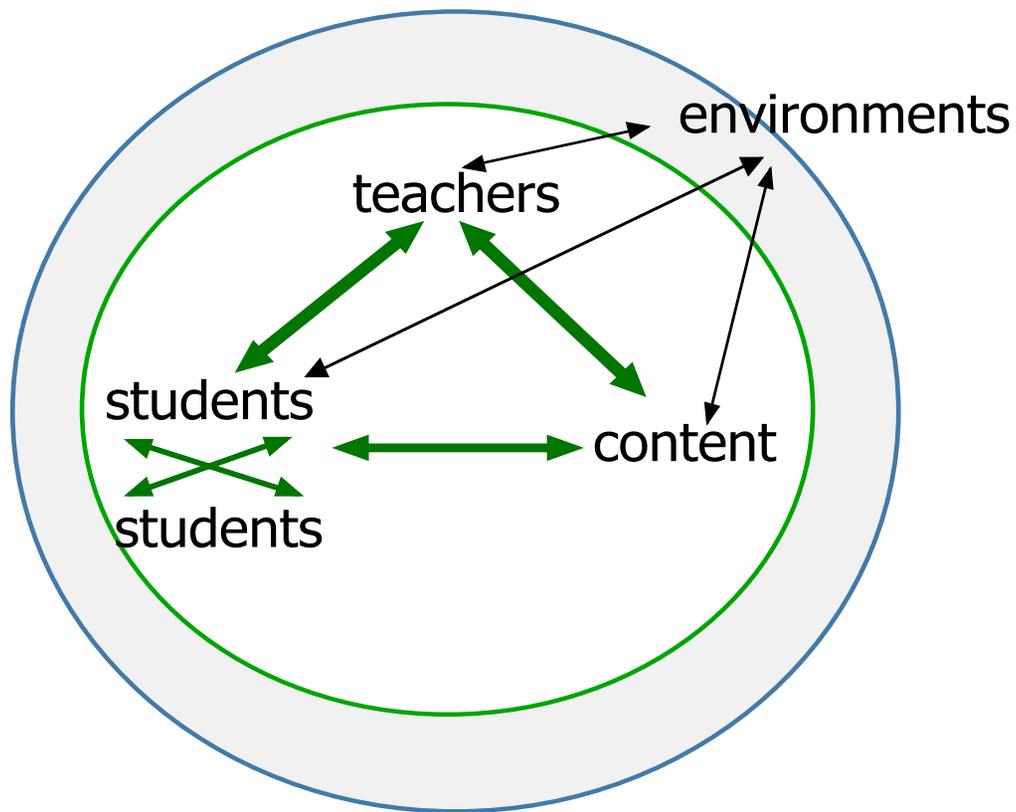


Instruction is co-constructed

- . . . in broad socio-political, historical, economic, cultural, community, family environments
- . . . through the interpretations and interactions of teachers, students, and “content”

Cohen, Raudenbush, and Ball (2003)

WHAT IS THE WORK OF TEACHING?



Taking responsibility for deliberately maximizing the quality of these interactions . . .

- . . . in ways that maximize the probability that students learn
- . . . worthwhile content and skills
- . . . and that advance a just society

Cohen, Raudenbush, and Ball (2003)

WHY “**WORK**” OF TEACHING”?

1. To focus our attention on what teachers DO and to distinguish this from other features of classrooms, such as instructional formats, classroom culture and norms, what students are doing, how the curriculum is designed

But what about small group work, open-ended problems, “grit,” etc.? Aren’t those what teachers DO?

WHY “**WORK**” OF TEACHING”?

1. To focus our attention on what teachers DO and to distinguish this from other features of classrooms, such as instructional formats, classroom culture and norms, what students are doing, how the curriculum is designed
2. To honor the effortful and deliberate nature of teaching and not to leave it invisible, implicit, and taken for granted

CALLING OUT CHILDREN'S COMPETENCE

A set of practices that deliberately deploy the power of teaching to:

1. Broaden and label what being competent in a given area means
2. Intervene to position who (and what) is seen as competent in class
3. Support individual children to develop their academic identities and competence

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 “CALLING OUT” CHILDREN’S COMPETENCE REQUIRE IN TEACHING?

IN GENERAL

1. Broaden and label what being competent in a given area means
2. Intervene to position who (and what) is seen as competent in class
3. Support individual children to develop their academic identities and competence

IN MATHEMATICS

1. Be able to see what is “mathematical” and what is “competent”
2. Have techniques for making these moves to intervene in ways that are sensitive to children
3. Strategically using these techniques with particular children in authentic and well-timed ways

STORY #2

SEEING AND BUILDING ON ANIYAH'S AND TONI'S STRENGTHS



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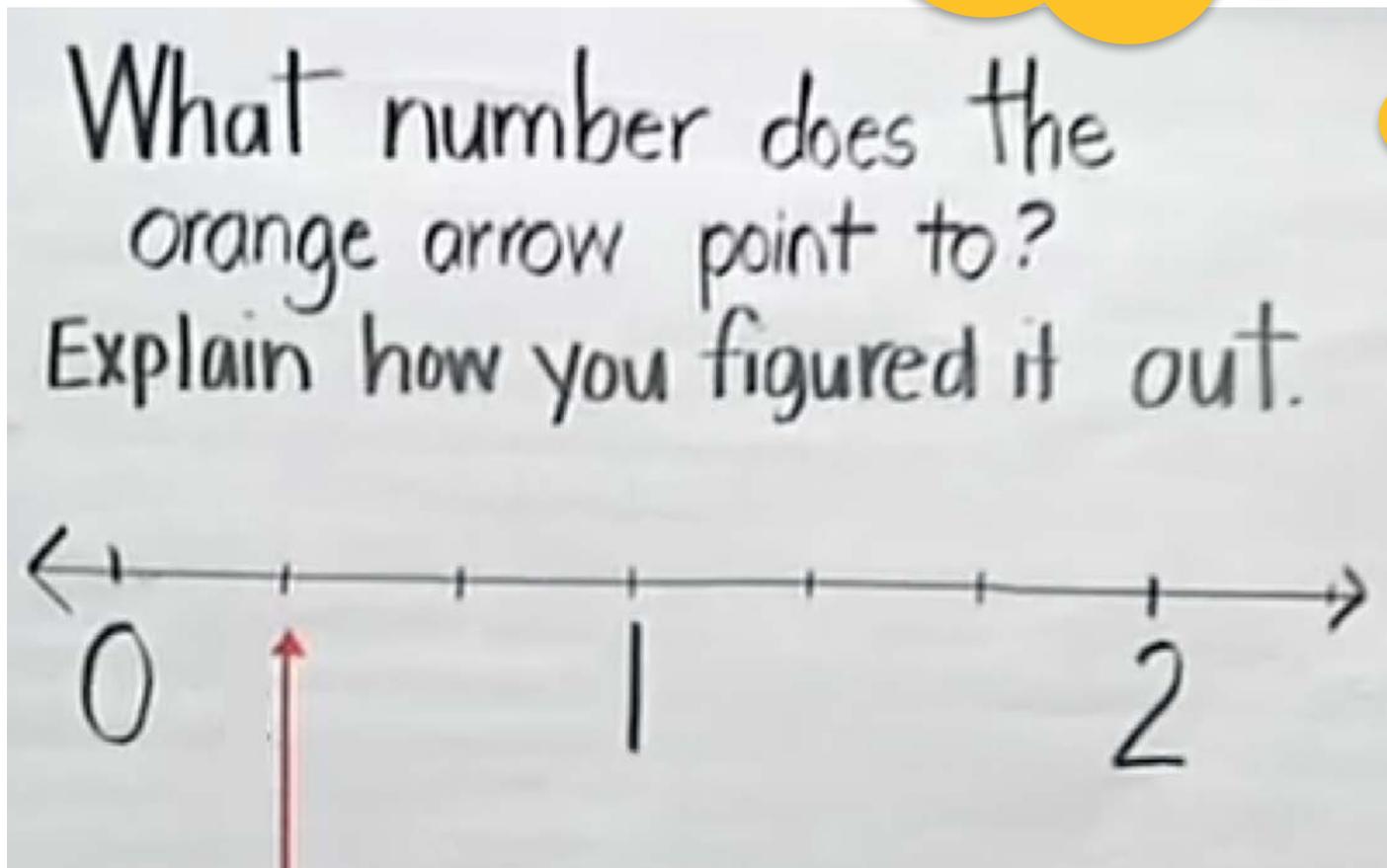


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A MATHEMATICAL TASK

What does this task demand of children?



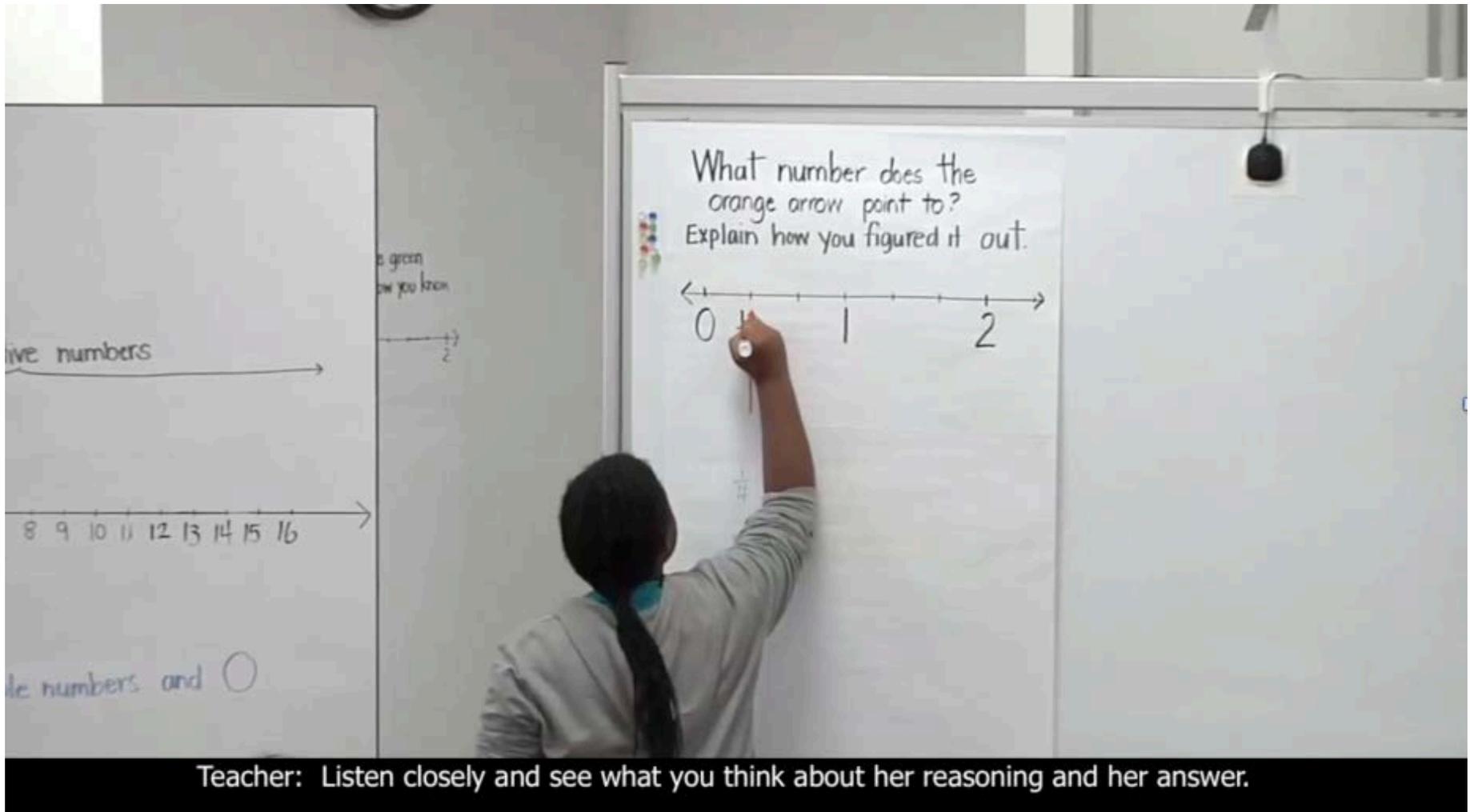


ANIYAH



TONI

VIDEO: ANIYAH AND TONI

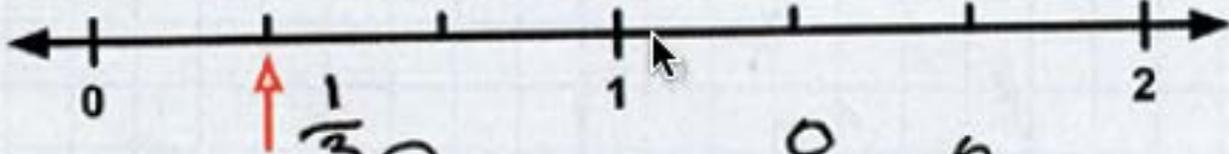


This video and additional supporting materials are available online [here](#).



TONI

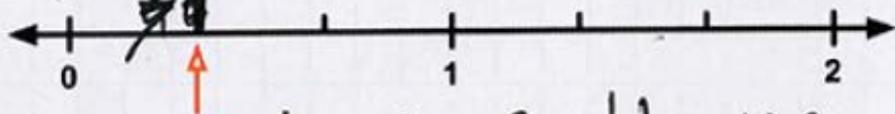
What number does the orange arrow point to? $\frac{1}{3}$



Explain how you know: Because its in
3 parts

LAKEYA

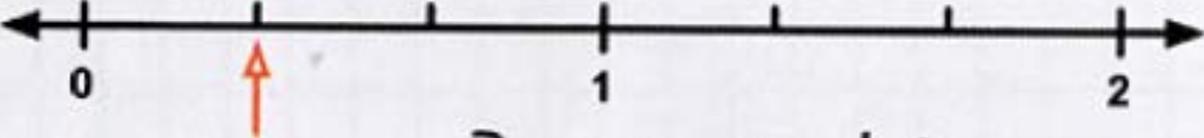
What number does the orange arrow point to? $\frac{2}{4}$ ~~$\frac{1}{2}$~~



Explain how you know: because there are ^{four} equal parts and you're pointing to the second one so it's $\frac{2}{4}$

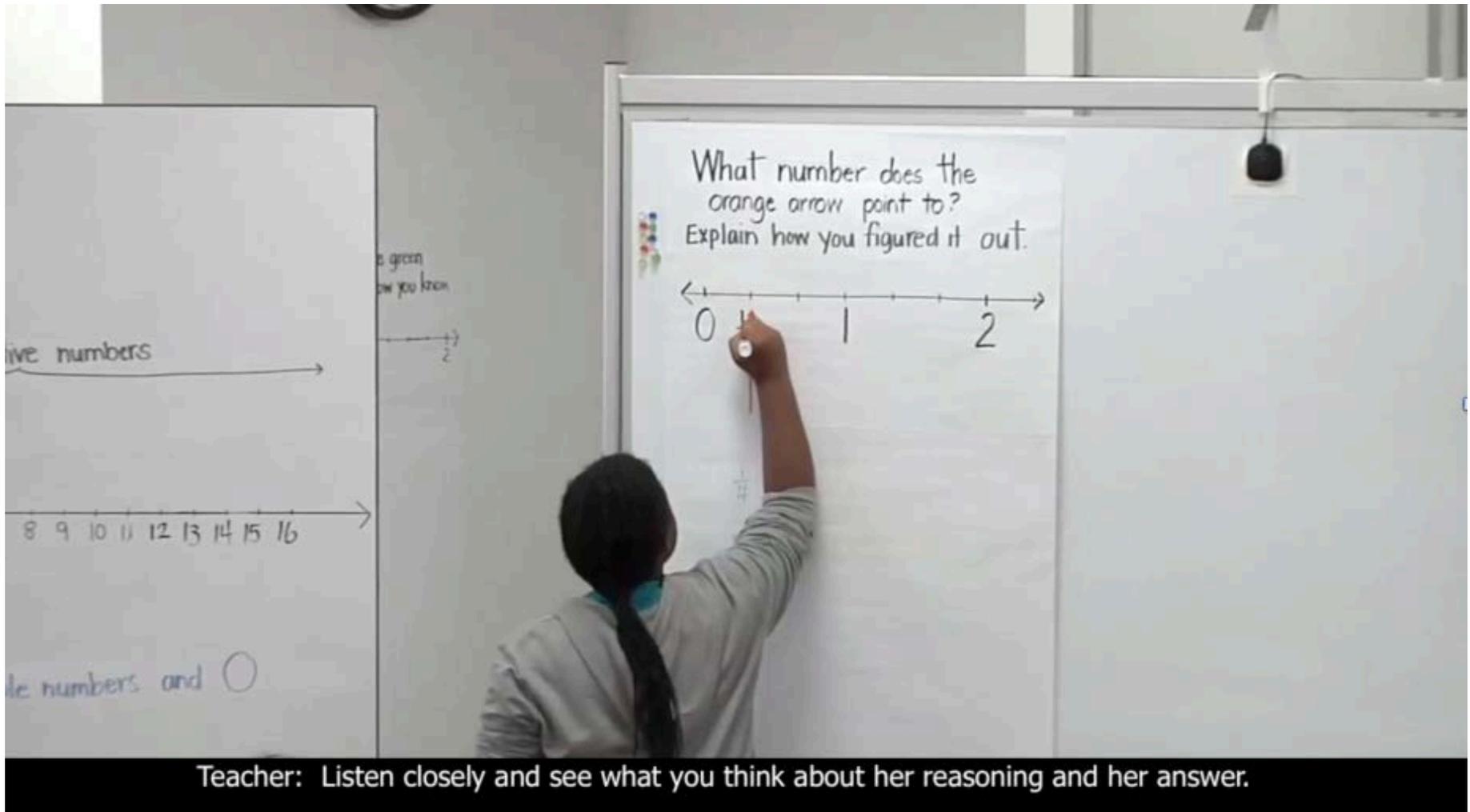
DANTE

What number does the orange arrow point to? $\frac{1}{2}$



Explain how you know: Because if you
 look at it and count.

VIDEO: ANIYAH, TONI, LAKEYA, DANTE



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



What does **Aniyah** know and what can she do?
What does **Toni** know and what is she able to do?



WHAT DO MANY “HEAR” IN ANIYAH AND TONI?

ANIYAH

- She has the wrong answer: 1/7

TONI

- She is playing with her hair and trying to get attention
- She is trying to embarrass Aniyah

WHAT DO ANIYAH AND TONI KNOW AND WHAT CAN EACH DO?

ANIYAH

- Uses the definition for a fraction to explain
 - She identifies the “whole”
 - She makes sure the intervals are equal
 - She counts intervals and not tick marks
 - She knows how to write “one-seventh”
- Produces a mathematically well-structured explanation
- Presents her ideas clearly

TONI

- Listens closely to a classmate’s presentation
- Uses the definition for a fraction to ask
 - How Aniyah decided on 7 parts
- Asks a pointed mathematical question

USING TECHNIQUES AND STRATEGIES FOR CALLING OUT CHILDREN'S COMPETENCE

Identify the competence to be highlighted. Consider how to disrupt hierarchies of status in class by which child is to be “called out” as competent.

- Call out an individual child's competent move or contribution publicly (“___ just shared a very important idea”)
- Ask a child to explain another child's contribution that the teacher highlights
- Ask the class to identify things that were part of an important contribution by one of the children
- Write something publicly that a child or children came up with or contributed that is important
- Accord expertise to children through assigning roles explicitly in a group

NEXT STEPS
**SUPPORTING TEACHERS TO LEARN TO SEE
AND BUILD ON CHILDREN'S RESOURCES
AND INTERVENE ON INEQUITIES THROUGH
THE PRACTICE OF CALLING OUT
CHILDREN'S COMPETENCE**



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MAKING THE SHIFT FROM A PREOCCUPATION WITH DEFICITS TO A FOCUS ON STRENGTHS

- Seeing past “distractions” or non-mathematical issues
 - Behavior that distracts the teacher, but not the child or the other children (Noel, 2014)
 - How children talk (as they are learning; and when they are speaking academic language, or in English when that is not their first language)
- Pausing on “apparently incorrect” answers
 - Actually not incorrect
 - Answer to a different (and reasonable) question
 - More correct than incorrect

DILEMMAS OF LEARNING TO SEE AND HEAR CHILDREN'S RESOURCES

1. Feeling committed to children as sense-makers who bring many strengths and feeling pressure to make sure children get it “right”
2. Using yourself yet also suspending assumptions based on what you would mean or feel
3. Knowing mathematics well enough to see “mathematics” in children’s talk, representations, etc. while also not letting your own mathematical knowledge overtake your capacity to see and hear what they are saying or showing

WHAT IS INVOLVED FOR THE TEACHER IN SEEING AND BUILDING ON CHILDREN'S STRENGTHS?

- Listening carefully to what they say, reading attentively what they write
- Making deliberate choices about how to see and interpret
- Both of these involve using what you know, but also suspending what you assume (knowing mathematics *for teaching*)

OPPORTUNITIES TO LEARN TO BUILD SKILLS IN SEEING, HEARING, AND BUILDING ON CHILDREN'S RESOURCES

- Examining challenging video clips with others
- Looking at children's written work and drawings
- Doing the mathematics that children are doing
- Seeing children outside of school, in community settings: look not just for mathematical content but also practices

THANK YOU!

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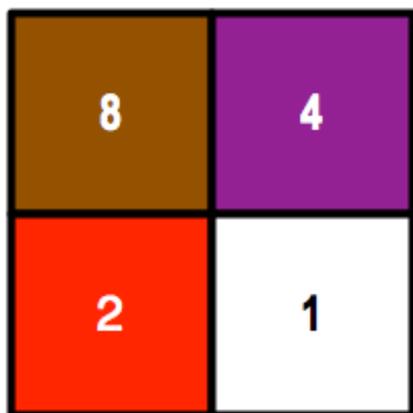
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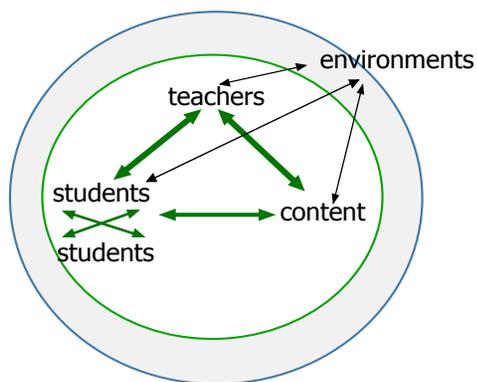
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CREDITS



Graphic on slides 12, 13, 19, 20, and 21:

Papy, F. (1970). Papy's mincomputer. *Mathematics Teaching*, 50, 40–45.



Graphic on slides 24 and 25:

Cohen, D. K., Raudenbusch, S., & Ball, D. L. (2003). Resources, instruction, and research. *Educational Evaluation and Policy Analysis*, 25 (2), 119-142.