



Culture, Children's Mathematics, and Ways of Knowing.

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AIMS Center



Culturally
Relevant
Pedagogy

CAEMI Summer Institute 2019

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#CAEMI2019



Achievement Based Objectives

By the end of this
session we will
have...

1


Explored our own mathematics identities and the ways these are shaped through experiences

2

Examined a stance on teaching and learning mathematics that embraces cultural diversity and children's mathematics

3

Shared commitments to moving forward with perspectives that broaden notions of participation in mathematics

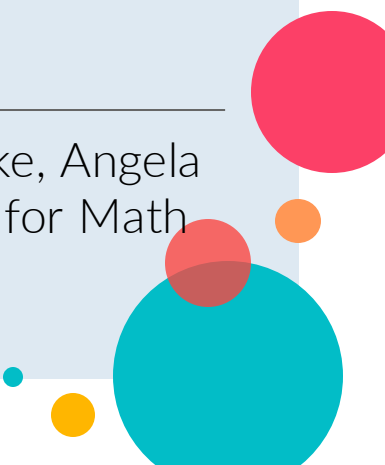




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Stance on Teaching and Learning of Early Math

July 2019 • Collaborative working document by Megan Franke, Angela Turrou, and Nick Johnson (UCLA/ DREME) and AIMS Center for Math and Science Education





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In what ways do your current practices and approaches support this stance?


What might you add to this stance?






#1 Mathematics Identities

Mathematics identities are socially-constructed in ways that privilege and marginalize groups of individuals differently; challenging the status quo of who gets positioned as "good at math" is critical to disrupting inequity.



Aguirre, Mayfield-Ingram, and Martin (2013) define mathematical identity as "the dispositions and deeply held beliefs that students develop about their **ability to participate and perform** effectively in mathematical contexts and to **use mathematics in powerful ways** across the contexts of their lives" (p. 14).



Solve the equation for x:

$$(x^2 + 6x - 7)(2x^2 - 5x - 3) = 0.$$

$$x^2 + 6x - 7 = (x+7)(x-1) = 0$$

$$\Rightarrow x+7=0 \text{ or } x-1=0$$

$$\Rightarrow x = -7 \text{ or } x = 1$$

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For conversation in groups:

What is your mathematical identity?

Think of a moment when you felt like an “insider” in mathematics, when you felt empowered...

Think of a moment when you felt like an “outsider” in mathematics, when you didn’t belong...

Share either your insider or outsider moment.






#2 Children's Resources

Young children, no matter their age or background, bring with them diverse cultural and linguistic resources and robust mathematical understandings to learning situations.



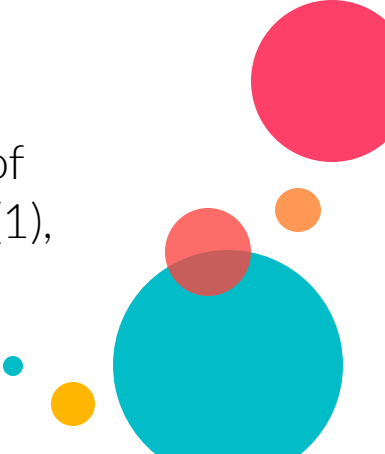
“From birth to age 5, young children develop an everyday mathematics – informal ideas of more and less, taking away, shape, size, location, pattern, and position – that is surprisingly broad, complex, and sometimes sophisticated.”

Ginsburg, H. P., Lee, J. S., & Boyd, J. S. (2008). Mathematics education for young children: What it is and how to



“Are we viewing the practice through a lens of academic mathematics? If **learning is a cultural process**, what are the implications of depriving practices of “their social and cultural specificity”? What would it look like to view practices through a lens of everyday mathematics?”

Civil, M. (2016). STEM learning research through a funds of knowledge lens. *Cultural Studies of Science Education*, 11(1), 41–59.






For conversation in groups:

Choose **three words** that are most meaningful to you in this statement:

Young children, no matter their age or background, bring with them diverse cultural and linguistic resources and robust mathematical understandings to learning situations.





#3 Intuitive Ideas

The role of early childhood educators and care providers is to build on children's intuitive ideas about math, drawing upon the resources that children bring as productive learning supports. This can occur in powerful ways across a range of informal and formal spaces, in playful, intentional, and developmentally appropriate ways.



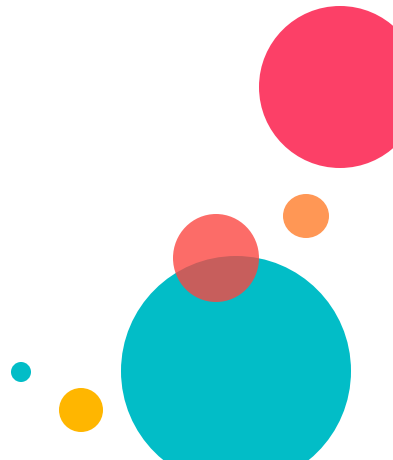
How many did you hear?



For conversation in groups:

Where do you see these three elements playing a role in your work?

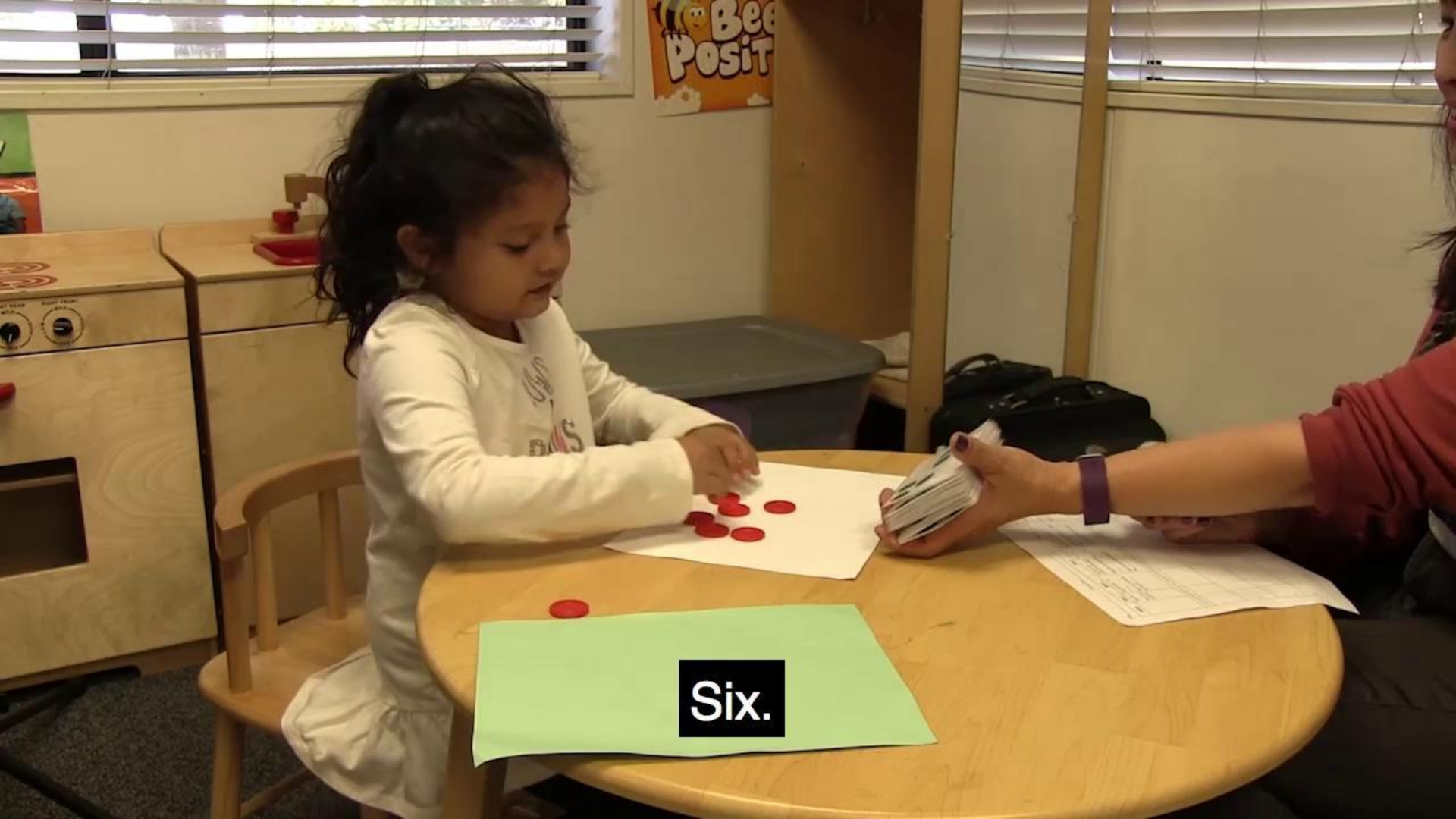
- **playful**
- **intentional**
- **developmentally-appropriate**





#4 Children's Mathematics

Research documents the development of children's mathematical understandings in early childhood. Attending to the details of children's thinking through the lens of research-based principles supports teachers to recognize what children understand and to make instructional decisions that build from what they know and can do.



Six.



For conversation in groups:

What are some mathematical understandings children in your context possess?

In what ways do teachers and adults build on children's understandings?





#5 Learning is Multimodal

Deep mathematical learning occurs through multiple modes of communication -- spoken language, gesture, movement, tools, and written representation together play an important role in supporting mathematical development for all children and specifically Dual-Language Learners.





For conversation in groups:

Where do you see these forms of learning in your work?

- **spoken language, gesture, movement, tools, and written representation**
- 



#6 Early Childhood Educators

Early childhood educators and care providers are professionals with vast experience and knowledge about supporting the development of young children. As lifelong learners, they should be supported to try new things, to take risks, to innovate, and to reflect as these processes are critical to long-term learning that is generative.







For conversation in groups:

What challenges do you face when considering how to support the continued growth of early childhood educators and care providers in your context?

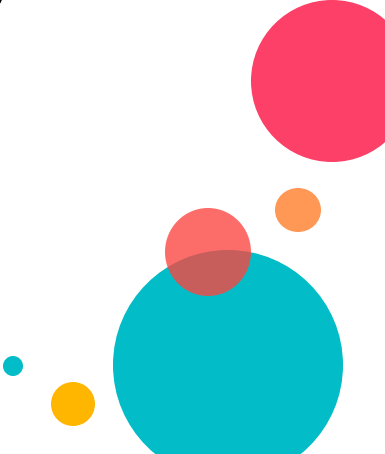




Table Reflection

Looking forward...



Under the Hood

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ANCHOR

- What is your math identity?
- What experiences have shaped its formation?

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ADD

- Stance on Teaching and Learning of Early Math

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APPLY

- Conversation about stance statements in your work

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AWAY

- Table Reflection; Looking forward...



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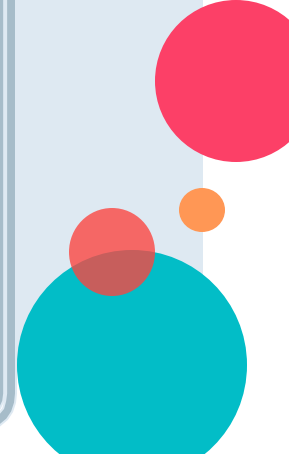


**Something to
think about...**

**A Stand Up
Conversation**

As you process this session's content, what are some ways you are thinking about using it in your professional learning plan?

What questions might you ask your staff to elicit their own understanding of this session's topic?





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References

Aguirre, J. M., & del Rosario Zavala, M. (2013). Making culturally responsive mathematics teaching explicit: A lesson analysis tool. *Pedagogies*, 8(2), 163–190.

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Ginsburg, H. P., Lee, J. S., & Boyd, J. S. (2008). Mathematics education for young children: What it is and how to promote it. *Social Policy Report*, XXII(I), 3–22.