## Adding Diverse Books to your Mathematical Practice



EARLY MATH SYMPOSIUM
JUNE 23, 2023

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Adding Diverse Books to your Mathematical Practice


1

JaNay Brown-Wood, Ph.D


Researcher/Scholar

- Conduct research investigating the lack of diversity in children's books and how it influences children's development and academic outcomes


## JaNay Brown-Wood, Ph.D



JaNay Brown-Wood, Ph.D

Mother and a Wife


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JaNay Brown-Wood, Ph.D


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## Agenda for Today

\% Welcome
*Thinking about past experiences
\% What does research and theory say
Math Considerations
Math + Literacy

* Math + Literacy + Diversity
* Utilizing Books and Materials
* Additional Resources


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To start off, I want you to think back on an experience from your past that made a lasting impression on you.


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When I think about this for myself...

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## Our past experiences affect us in lasting ways.

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Adverse Childhood Experiences (ACES)

ACES can have lasting effects on....Health (obesity, diabetes,
depression, suicide attempts. STDs, heart disease, cancer, stroke, COPD, broken bones)Behaviors (smoking, alcoholism, drug use)

Life Potential (graduation rates, academic achievement, lost time from work)

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## That is true about our relationship with literacy and math, too!



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## And what about math?



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I was not confident in math so I moved away from it!

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## What might my story have been if I had found a love for math?

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## This doesn't have to be the association children build with math!

We can begin to help them develop a LOVE for math and we can use books to help this!


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Domains of Children's Development

Emotional
Physical
nal


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## What does Theory say?:

Piaget's Cognitive Development Theory
Piaget theorized that early childhood is a time influenced by egocentric thinking

- Egocentrism: The difficulty of young children to take or fully understand the perspective or viewpoint of others


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40 start with self and extend outward.

And our cultures and lived experiences are included in this!


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Important to keep this in mind when teaching children math, literacy, and other disciplines as well.


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This includes the cultural practices of the children we teach.

## Thinking about Math

Some Foundational Early Math Concepts

Number Sense
2. Representation
3. Spatial Sense and Patterning
4. Measurement and Estimation
5. One-To-One Correspondence
6. Problem Solving


46

Some Additional Foundational Early Math Concepts

1. Number Sense
2. Representation
3. Spatial Sense and Patterning
4. Measurement and Estimation
5. One-To-One Correspondence
6. Problem Solving

All set the stage for and support cognitive development and mathematical thinking!
oto three: https://wwwzerotothree.org/resource/help-vour-child-develop-earlv-math-skilss

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## What is Mathematical Thinking?

Children's abilities to think about and explore a range of mathematical concepts especially in order to solve problems.


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49 In what ways are we building positive associations with math and our children's experiences?


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## Merging Math + Literacy

## Research Suggests

- Association between amount of time engaged with reading, reading activities and reading gains
- Different factors influence children's interest to engage with a book:
- Book topic
- Physical characteristics
- Children have preferences for things they have more familiarity with


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## Associations between math skills and literacy skills

- Research suggests there is a strong, and often predictive, relationship between math and reading achievement across development
- Early vocabulary skills supports budding numeracy skills
- Early reading comprehension had positive relationship with application and comprehension of math concepts
- Overlap with processes required for cognition-even shown with neuroimaging
- Some correlations as high as .70 in $\mathrm{K}, 1,2$, and $3^{\text {rd }}$ grade

Associations between math skills and literacy
skills

- Math skills early in Kindergarten year were better predictors of later reading achievement than early Kindergarten literacy skills
- Strong relationship between math and reading skills with regard to difficulties as well


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## Associations between math skills and literacy

 skills- Even as math and literacy skills develop, there is a relationship where math skills support reading skills, and vice versa
- And this persists through middle and high school


## Early literacy skills show connection to mathematical skills and ability

Even with this being said, the relationship between early reading and math skills is still not fully understood

However, it is incredibly clear that these is a connection between the two!

Thus, finding ways to connect the two is so important!

Merging Math + Literacy


61

## Merging

Math + Literacy + Diversity


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## The Power of Representation

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Representation is deeper than just the skin tone of a character, but this is a nice start.

But research also shows:
There is a lack of diversity in books published for children!

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## But research also shows:

There is a lack of diversity in books published for children!

This is important to think about especially since books are used to help support budding literacy skills!

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## How the Lack of Diversity Affects Children

"When children cannot identify with a book or see their lives celebrated through stories, it may have a negative impact on their self-image. The message they get is that their lives and their stories are not important" (Willett, 1995, p. 176)."
"Seeing self is critical, but not seeing self is even more critical because children may feel marginalized" (Koss, 2015, p. 22)

74

This is why we must do more! This is why it is an equity issue related to teaching children and getting them excited about books and math!

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## Walter Dean Myers

said...
"Books transmit values. They explore our common humanity. What is the message when some children are not represented in those books?"

## Nancy Larrick says...

Although America is becoming increasingly diverse, there is a major lack of diversity in the children's books that are created, which gives a negative message to all the non-white children who are not represented (Larrick,


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Windows and Sliding Glass Doors give you a glimpse or help us step into another world (in an appropriate, realistic, meaningful way)


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Thus, it's important to expose children to books that they can connect to and that can motivate them to continue to read which has associations to math skills.

## Nation's Report Card for Math Scores



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As Rudine Sims Bishops states
"when children cannot find themselves reflected in the books they read, or when the images they see are distorted, negative, or laughable, they learn a powerful lesson about how they are devalued in the society of which thev are a part"


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How do we make sure our Literacy books have Representation and Math?



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Based on what I read and told you about for Grandma's Tiny House

Based on what I read and told you about for Grandma's Tiny House

- What math related activities might you pair with this book?
- How can you use this book to offer hands on experiences for the kids you work with?


2. Representation
3. Spatial Sense and Patterning
4. Measurement and Estimation
5. One-To-One Correspondence
6. Problem Solving

## And what about the math?



98


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Grandma's Tiny House

- This story incorporates
- Literacy
- Math
- Representation


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> What are you doing to find those books that support your children?

But we know representation is already difficult to find as is, how do we get this AND math?

# Storytelling Math 



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## Thinking outside of the box

THINKING BEYOND THE EASY AND OBVIOUS

Math is EVERYWHERE around us!
So let's use books with rich stories and diversity to engage young learners in mathematical concepts!


110


## Some Foundational Early Math Concepts

1. Number Sense
2. Representation
3. Spatial Sense and Patterning
4. Measurement and Estimation
5. One-To-One Correspondence
6. Problem Solving


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Center on finding books that represent your children then begin to think about how math is EVERYWHERE and work from there!


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Where is the math here?


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What other ways may you engage mathematical skills in this activity?

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## Activity

Find a non-math themed book in your environment

- Read it
- Ask yourself: does it have diversity?
- Now think about, what math related activities might I pair with this activity, even if it does not have any apparent math included?
- How can I make this hands on for the kids I work with?


# Merging <br> Math + Literacy + Diversity 

CAN SUPPORT ALL DOMAINS OF DEVELOPMENT


## Domains of Children's Development

Cognitive

132

# But the effort is so worth 

This may mean going back to skills and connecting seemingly "non-math" books and thinking outside the box!

1. Number Sense
2. Representation
3. Spatial Sense and Patterning
4. Measurement and Estimation
5. One-To-One Correspondence
6. Problem Solving



135

But also, igniting an interest in literacy and math by helping children to connect to it in a meaningful way!

Being intentional in including
Math + Literacy + Diversity

Your impact as teachers and advocates is IMMENSE and FAR-REACHING


139


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## Math Picture Books

- https://dreme.stanford.edu/news/40-childrens-books-that-foster-a-love-of-math/
- https://www.weareteachers.com/picture-books-about-math/
- https://www.teachingexpertise.com/classroom-ideas/picture-books-about-math/
- https:/ /imaginationsoup.net/ the-biggest-list-of-the-best-math-picture-books-ever/


Resources for Parents, Educators, and Librarians

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146

Additional References available upon request


149


150


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