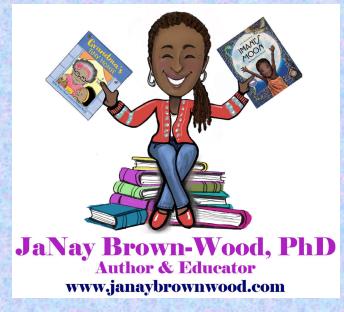
# Adding Diverse Books to your Mathematical Practice



EARLY MATH SYMPOSIUM JUNE 23, 2023

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www.janaybrownwood.com

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JaNay Brown-Wood, Author & Educator

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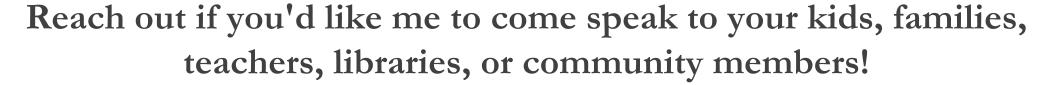
@janaybrownwood

**Email** 

janay@janaybrownwood.com

Subscribe to my free

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## Adding Diverse Books to your Mathematical Practice



EARLY MATH SYMPOSIUM JUNE 23, 2023 JaNay Brown-Wood, Ph.D

Educator



• Former Professor of Early Childhood Education and Child & Adolescent Development

 $\circ$  Degrees in Psychology, Child Development, and Education







#### JaNay Brown-Wood, Ph.D

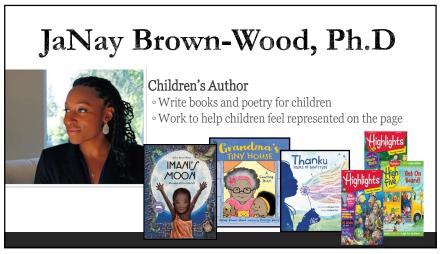


#### Researcher/Scholar

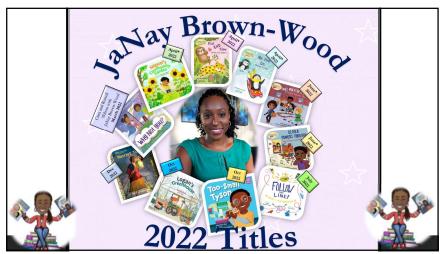
 Conduct research investigating the lack of diversity in children's books and how it influences children's development and academic outcomes JaNay Brown-Wood, Ph.D

Mother and a Wife













Welcome

#### 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



10

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

11 12

When you think of that experience, how does it make you feel?

FEEL FREE TO SHARE IT IN THE CHAT

When I think about this for myself...

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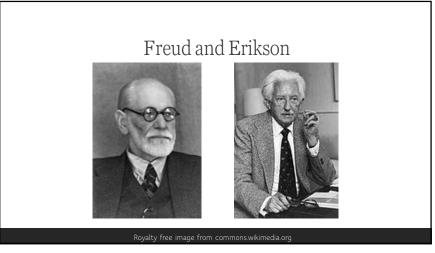
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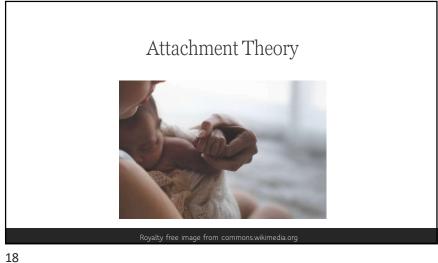
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Mrs. Welch

5th/6th Grade

Our past experiences affect us in lasting ways.





17

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)

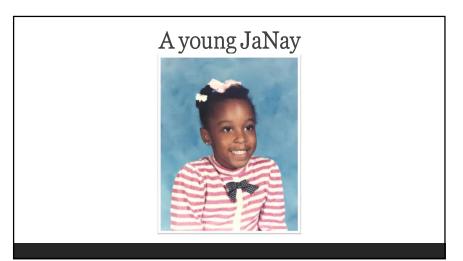
Life Potential (graduation rates, academic achievement, lost time from work)

https://commons.wikimedia.org/wiki/File.Lasting\_affects\_of\_Adverse\_Childhood\_Experiences.png

Our past experiences affect us in lasting ways!

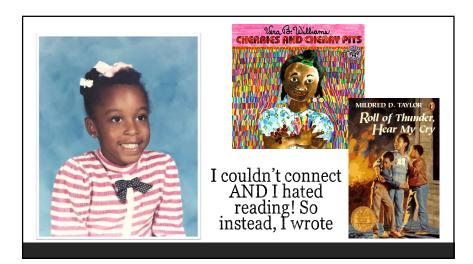
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That is true about our relationship with literacy and math, too!



21 22



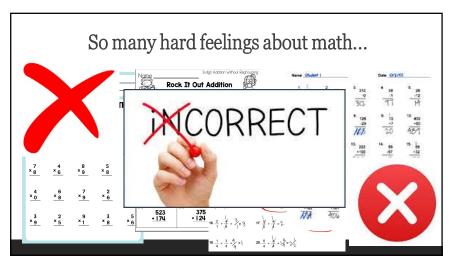


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And what about math?



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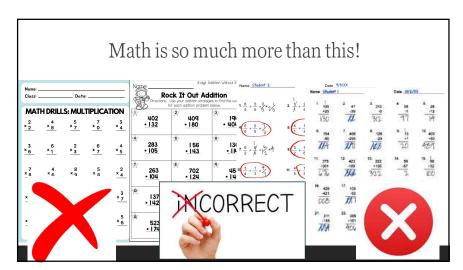
I was not confident in math so I moved away from it!

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



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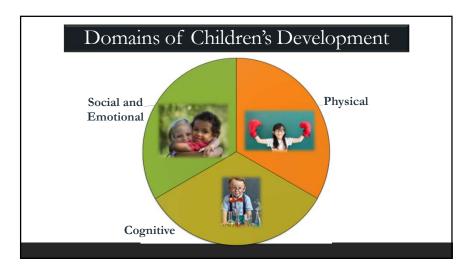
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This doesn't have to be the association children build with math! We can begin to help them develop a LOVE for math and we can use books to help this!

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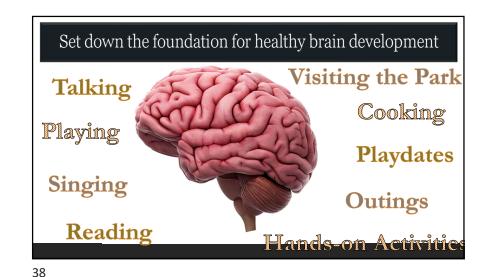
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What does theory and research say?



35





## What does Theory say?: Piaget's Cognitive Development Theory

Piaget theorized that early childhood is a time influenced by egocentric thinking

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



Many of our understandings of the world start with self and extend outward.

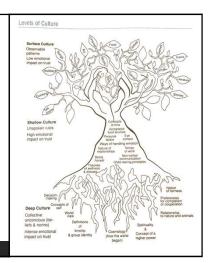
And our cultures and lived experiences are included in this!

39 40

#### Hammond's Ideas of Culture

- There a three levels of culture
- Surface
- Shallow
- Deep
- Culture
- Is the lens our brains use to interpret the world and process information
- In order to learn new information we must meld it with our existing knowledge

Hammond, Z. (2015). C*ulturally Responsive Teaching and the Brain* 



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

41

## Literacy and Math are EVERYWHERE!

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



45 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!

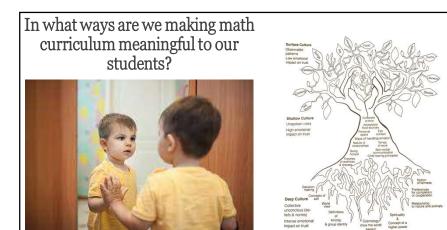
(Erikson Institute: <a href="https://earlymath.erikson.edu/why-early-math-everyday-math/big-ideas-learning-early-mathematics/">https://earlymath.erikson.edu/why-early-math-everyday-math/big-ideas-learning-early-mathematics/</a>;

Zero to three: <a href="https://www.zerotothree.org/resource/help-your-child-develop-early-math-skills/">https://www.zerotothree.org/resource/help-your-child-develop-early-math-skills/</a>)

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?

| The state of the state of

Hammond, Z. (2015). Culturally Responsive Teaching and the Bra

## 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

50

- o Physical characteristics
- Children have preferences for things they have more familiarity with



51 52

#### Research Suggests



- Strong reading skills relates
  - Increases in motivation and confidence
  - Advancements in other academic and content areas such as
  - History
  - O Science
  - O Literature
  - Geography
  - Social Sciences
  - Math

(Gaddy, 2003; Grimm, 2008Pianta, La Paro, Payne, Cox, & Bradley, 2002; Pianta, 2007; The U.S. Department of Education, 2003

## 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 K, 1, 2, and 3<sup>rd</sup> grade

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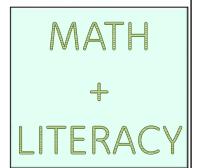
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Aiken, 1971; Carey, 2004; Grimm, 2008; Farakas et al., 2020; Monroe & Englehart, 1931; Cirino, Child, & Macdonald, 2018; Geary, 2010; Jordan, Hanich, Kaplan, 2003; Korpipää et al., 2017

53

Associations between math skills and literacy skills

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



Carey, 2004; Duncan et al., 2007; Claessens, Duncan, & Engel, 2009; Claessens & Engel, 2013; Hecht et al., 2001; Hooper, Roberts, Sideris,

Rurchinal & Zeisel, 2010; Pagani, Fitzpatrick, Archambault, & Janosz, 2010; Pupura et al., 2007)

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

Claessens et al., 2009; Claessens & Engel, 2013; Duncan et al., 2007; Michalczyk et al., 2013; Praet et al., 2013; Pupura et al., 2007; Simmons e al., 2008

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1 /

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

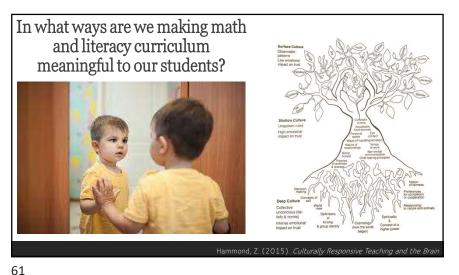
However, it is incredibly clear that these is a connection between the two!

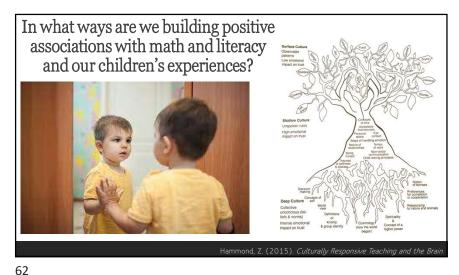
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Thus, finding ways to connect the two is so important!

Merging
Math + Literacy





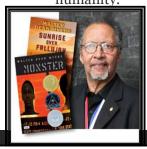
Merging
Math + Literacy + <u>Diversity</u>

The Power of Representation

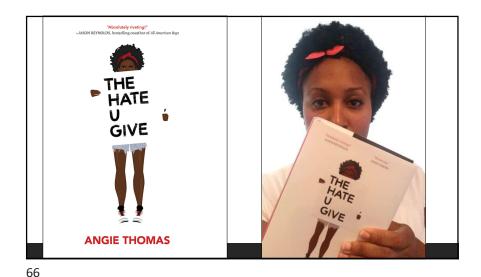
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#### Walter Dean Myers said...

"Books transmit values. They explore our common humanity."



65



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!

67

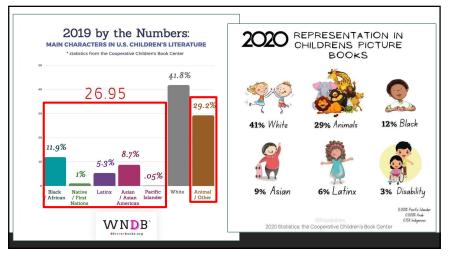
#### But research also shows:

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!

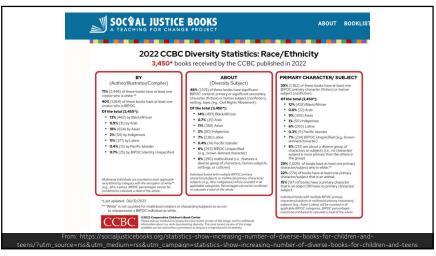


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71 72



#### 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)

73

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!

## 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, 1965).

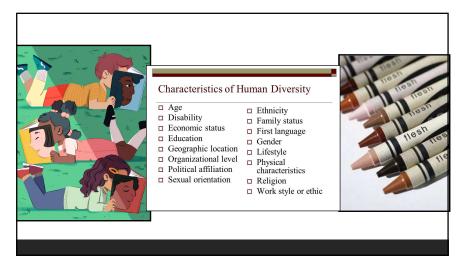


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Windows and Sliding Glass Doors give you a glimpse or help us step into another world (in an appropriate, realistic, meaningful way)

77





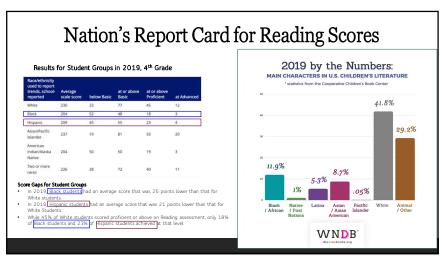
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#### Nation's Report Card for Math Scores

#### **Results for Student Groups in 2019**

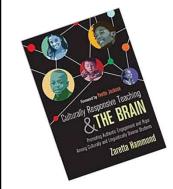
Reporting Groups	Percentage of students	Avg.	abov	e NAEP Proficient	NAEP
Race/Ethnicity					
White	21	250	89	54	13
Black	6	224	67	19	2
Hispanic	58	225	66	20	2
Asian	10	259	93	66	2 22
American Indian/Alaska Native	#	4		#	
Native Hawaiian/Pacific Islander	1	#	#	#	#
Two or more races	5	251	90	54	15
Gender					
Male	50	236	76	36	8
Female	50	233	74	32	6
National School Lunch Program					
Eligible	60	223	65	19	2
Not eligible	40	252	90	56	15
# Rounds to zero.  ‡ Reporting standards not met.  NOTE: Detail may not sum to totals because o School Lunch Program, which provides free/re	f rounding, and becauseduced-price lunches, is	e the "Infor	mation not a	vailable" category	for the National

#### Score Gaps for Student Groups

- for White students. This performance gap was not significantly different from that in 2000 (35 points) had an average score that was 25 points lover that hat for White students. This performance gap was not significantly different in 2019, maile students in California had an average score that was not significantly different from that for female students. In 2019, students who were eligible for the National School Lunch Program (NELP) had an average score that was not significantly different from that for the Mational School Lunch Program who were eligible for the National School Lunch Program of the NelP Lunch Program (NELP) had an average score that was 20 points lower than that for students who were not eligible. This performance gap was not significantly different from that in 2000 (29 points).

85 86

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.



"Our goal is to help culturally and linguistically diverse students easily reach a state of relaxed alertness—that combination of excitement and anticipation we call engagement...It is our responsibility to create the right conditions for optimum learning"

Hammond, 2015 p.50

87 88

Must be intentional in the materials we select!

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 they are a







89

Literacy and Math are EVERYWHERE!

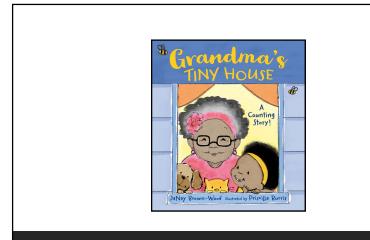
Representation Matters!



How do we make sure our <u>Literacy</u> books have <u>Representation</u> and <u>Math</u>?

91 92

## Intentionality!

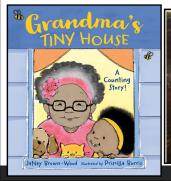


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Now, take a moment reflect on this:

Did anything in this book remind you of your childhood or your experiences? How?

#### A Direct Mirror to my Childhood



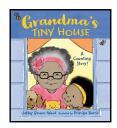


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2/

But still, something that so many others who don't look like me or who don't share my experiences can still relate!

#### And what about the math?



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#### Activity

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?

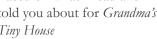
- Number Sense
- Representation
- Spatial Sense and Patterning
- Measurement and Estimation
- One-To-One Correspondence
- Problem Solving

#### Some ideas?

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

- What math related activities might you pair with this book?
- offer hands on experiences for
- Counting
- 1-15
- Counting family members in your home and comparing
- Graphing family members
- Using diverse family figurines in the block area and this with kids as they play

98



- How can you use this book to the kids you work with?

supporting conversations about





#### Some ideas?

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?

#### Volume

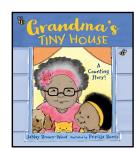
- How many X can fit inside a Y
- (Blocks, marbles, etc.)
- Height
- Family members (and classmates) come in all different sizes. Let's measure!

#### Grandma's Tiny House

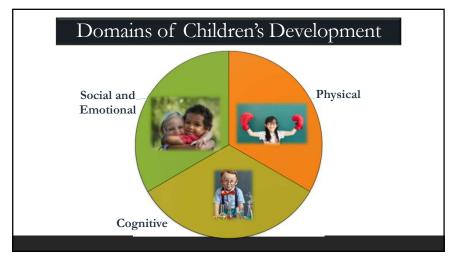
- •This story incorporates
- Literacy
- Math

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Representation



101



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

103

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

Storytelling Math

105





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109

## Thinking outside of the box

THINKING BEYOND THE EASY AND OBVIOUS



111

#### 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



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 in the Garden



Where in the Garden
Compare and contrast

115









Where is the math here?

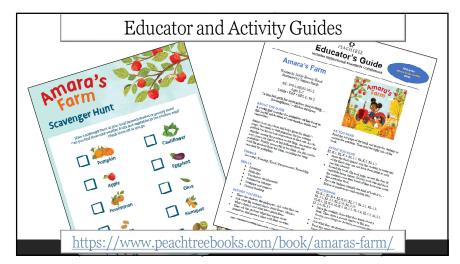
Where is the Math Here?

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

121 122

## Cooking with JaNay

UTILIZING SUPPLEMENTAL MATERIALS PROVIDED BY AUTHORS, PUBLISHERS, AND OTHERS



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Where is the math here?

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

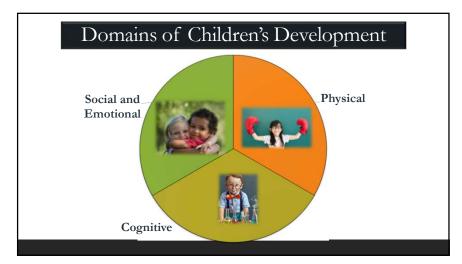
- Read it
- Ask yourself: does it have diversity?
- Now think about, what math related activities might I pair with this activity, even if it does not have any apparent math included?
- How can I make this hands on for the kids I work with?

How'd that go?

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Merging Math + Literacy + <u>Diversity</u>

CAN SUPPORT ALL DOMAINS OF DEVELOPMENT



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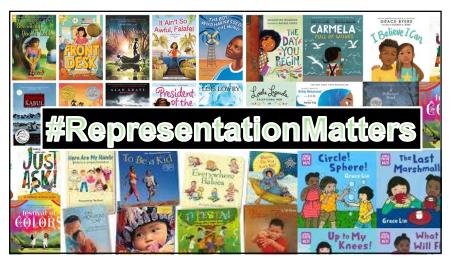
This may mean going back to skills and connecting seemingly "non-math" books and thinking outside the box!

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



But the effort is so worth it!

133

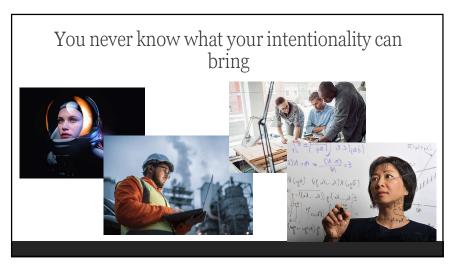


But also, igniting an interest in literacy and math by helping children to connect to it in a meaningful way!

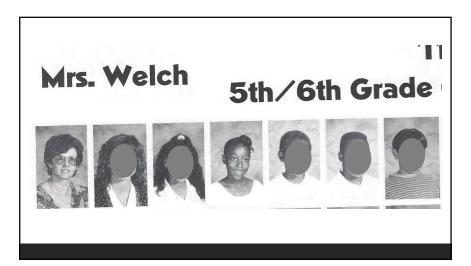
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## Being intentional in including Math + Literacy + Diversity



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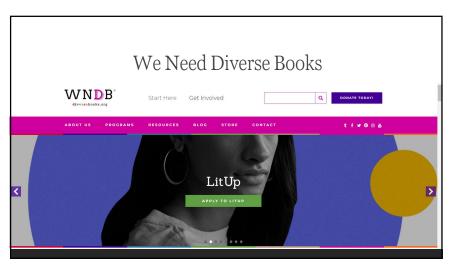
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Our kids deserve the opportunity to find their true passions no matter what it is!

Resources to Identify Diverse books

141 142

# List of Resources The Conscious Kid https://www.theconsciouskid.org/ #Disrupt Text https://disrupttexts.org/ American Indians in Children's Literature https://americanindiansinchildrensliterature.blogspot.com/ Children's Book Council Diversity http://www.cbcdiversity.com/ First Books https://firstbook.org/ We Need Diverse Books https://diversebooks.org/



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Resources for Parents, Educators, and Librarians

Resources for Parents, Educators, and Librarians

Resources for Parents, Educators, and Librarians

Resources for Banned Books Week and Beyond from We Need Diverse Books

Heartdown Educator Guide to an width Mative children's books from the Heartdrum imprint of HarperCollins

CBC Diversity, Resolating, Lists

Where Lo Find Diverse Books

Diverse-conned Books Educators

Diverse-conned Book Educators

Diverse-conned Books

Diverse-conned Book Educators

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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/
- <a href="https://www.teachingexpertise.com/classroom-ideas/picture-books-about-math/">https://www.teachingexpertise.com/classroom-ideas/picture-books-about-math/</a>
- https://imaginationsoup.net/the-biggest-list-of-the-best-math-picture-books-ever/

Additional References available upon request

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#### Share your Feedback

I'd love to hear your feedback about my presentation:

https://forms.gle/qJ1dGayKfnB oWPNS7







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