

Get the Picture: Connecting Young Children to Mathematics Through Books

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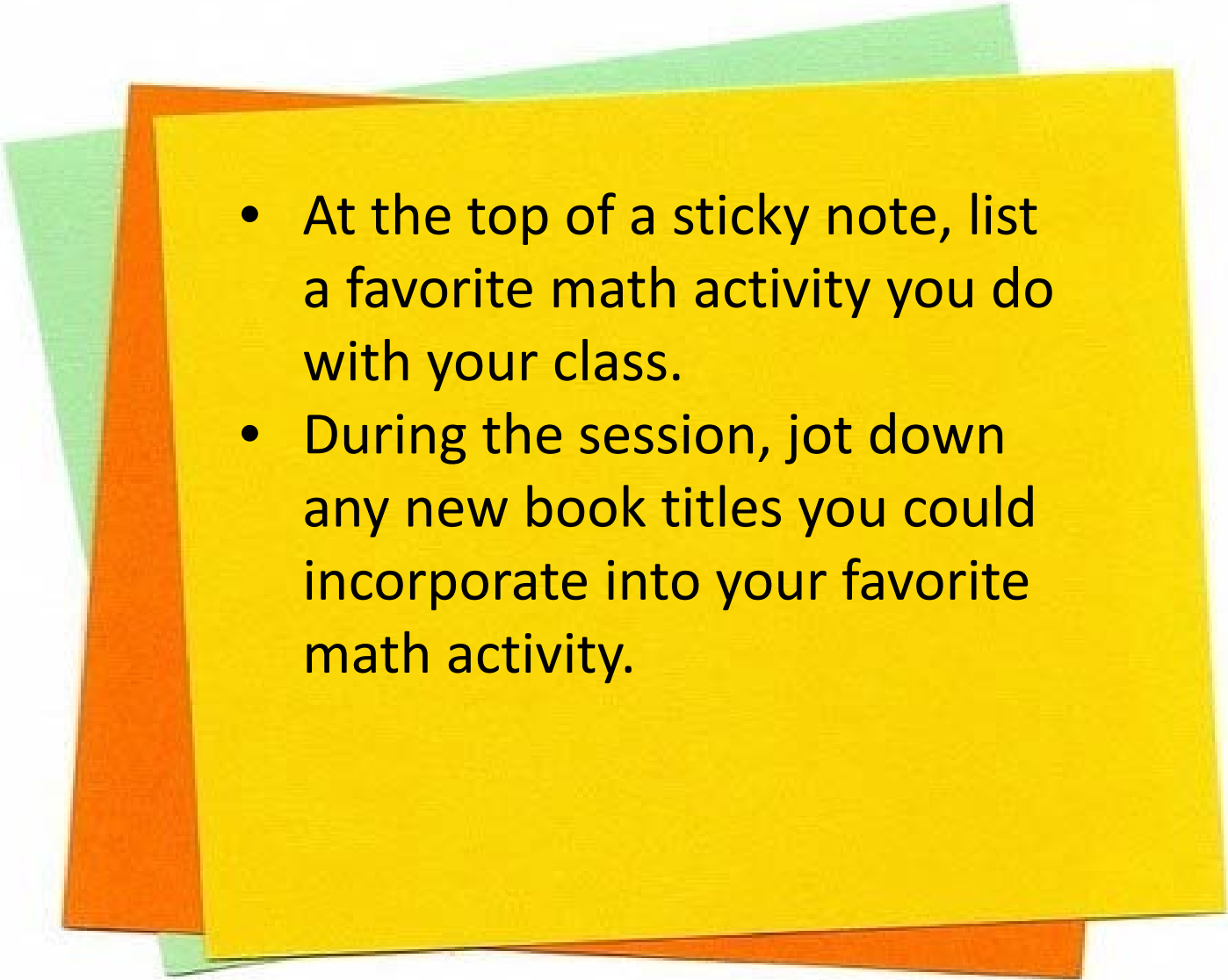
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Welcome Activity

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- At the top of a sticky note, list a favorite math activity you do with your class.
 - During the session, jot down any new book titles you could incorporate into your favorite math activity.

Agenda

- Think-Pair-Share Activity
- Research Support
- Books and Teaching Ideas for
 - Whole Group
 - Stations
 - Take-home book bags
- Mathical Book Prize
- Questions
- Door Prizes!

--*One Family* (Shannon & Gomez, 2015)

Think-Pair-Share

1. Why do you feel it is important to incorporate trade books in math instruction?
2. What strategies have you used for incorporating trade books in math instruction?





- Books with contexts rich in number, measurement, geometry, and problem solving

connect to children's interests, prior knowledge, and new schema for mathematics content, vocabulary, and processes.

- Young children don't differentiate between **math time** and **reading time**.

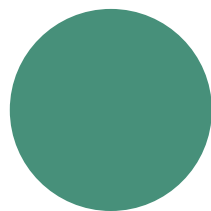
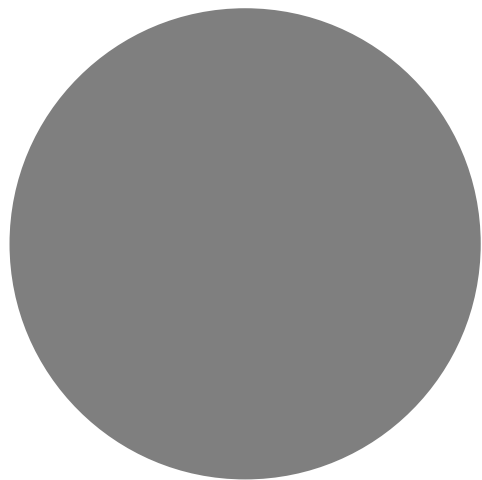
Why Use Books in Math?

Using Literature Improves Young Children's...

- **Mathematical understanding** (Casey, Kersh, & Young 2004; Marston, Muir, & Livy 2013; van den Heuvel-Panhuizen, Elia, & Robitzsch 2016)
- **Mathematical vocabulary** (Roskos & Burstein 2011; Anderson, Anderson, & Shapiro, 2005)
- **Discourse** (Hojnoski, Columba, and Polignano 2014)
- **Subitizing** (Anderson, 1997)

And
Improves...

- **Measurement** (van den Heuvel-Panhuizen & Elia 2011)
- **Geometry** (Skoumpourdi & Mpakopoulou 2011)
- **Classification** (Hong 1996)
- **Numeracy** (Young-Loveridge 2004)
- **Cognitive-mathematical thinking** (Elia, van den Heuvel-Panhuizen, & Georgiou 2010)
- **Cognitive engagement** (van den Heuvel-Panhuizen & van den Boogaard 2008)



Whole group lessons

Planned math activities extend children's learning beyond casual curiosity to deep understanding.

Children use **positional words** to describe the unrecognized perils of Rosie the chicken as she journeys through the farmyard.

1. To infuse movement, children act out the book using **simple props** such as a toy tractor, plush animals representing the goat and fox, and shredded yellow paper for the haystack.
2. The teacher draws a **map** of the farmyard on a large sheet of paper. Children move a plush Rosie chicken among the perilous places.

Rosie's Walk (Hutchins 1971)

Just How Long Can a Long String Be? (Baker 2009)

1. Children use string to measure long and short parts of their bodies—their height, their noses, their waists—and order the lengths of string from shortest to longest.
2. Challenge children to identify an item that is longer than their longest string and an item that is shorter than their shortest string.

Bird unravels string from page to page, showing that a string's length depends on how it will be used: to tug a balloon, create a mop, or produce sound on a banjo.

1. Children sort and classify their classmates' shoes.
2. They can then use the shoes to make a pattern
3. Finally, use the shoes to make a graph.

Shoes for Me (Fliess 2011)

Rhino outgrows her old shoes and goes shopping for new ones. She chooses from shoes that zip, tie, glitter and glow.

1 2 3: A Child's First Counting Book (Jay, 2007)

Illustrated with scenes from familiar fairy tales, this book counts from 1 to 10 and back again and connects mathematics to stories children know well.

1. Identify numbers in favorite nursery rhymes and fairy tales.
2. Make a class book called *Numbers in Nursery Rhymes* with each person responsible for his/her own page.

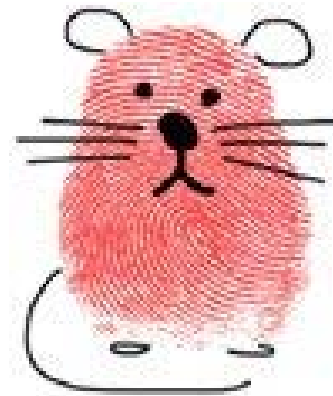
Station Activities

- We will share readings of a few picture books, then offer suggestions for station activities and lessons.
- Then you will brainstorm additional teaching ideas for shared books.



One Foot Two Feet: An Exceptional Counting Book (Maloney & Zekauskas, 2011)

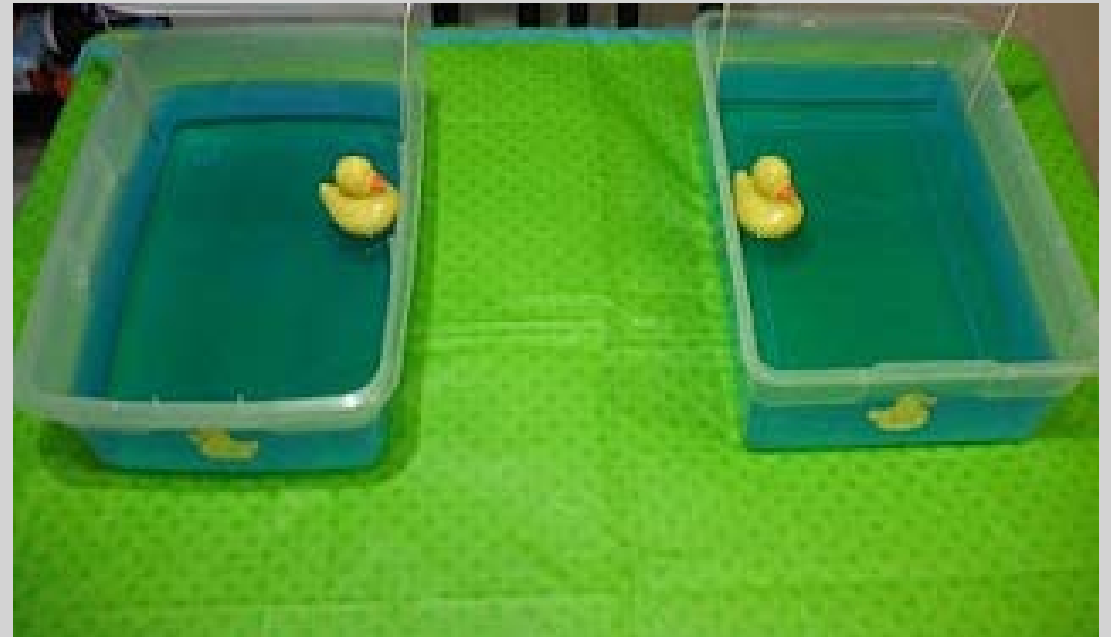
- Have children make mice by pressing their thumb onto an ink pad and adding ears, eyes, and tail with a marker.
- Children can count to see how many mice fit on an index card.



Brainstorm other ideas for this book!

Ten Little Rubber Ducks (Carle, 2005)

1. With string mark a finish line across the end of the sensory table.
2. Add water and rubber ducks.
3. With straws children blow the ducks toward the finish line.
4. Practice ordinal numbers by declaring which duck crosses first, second, third, fourth, fifth, sixth...



Brainstorm other ideas for this book!

Square Cat (Schoonmaker, 2011)

1. “What if there were no circles?”
2. Children use clay to design bicycles or cars with square, triangular, or rectangular wheels.

Brainstorm other ideas for this book!



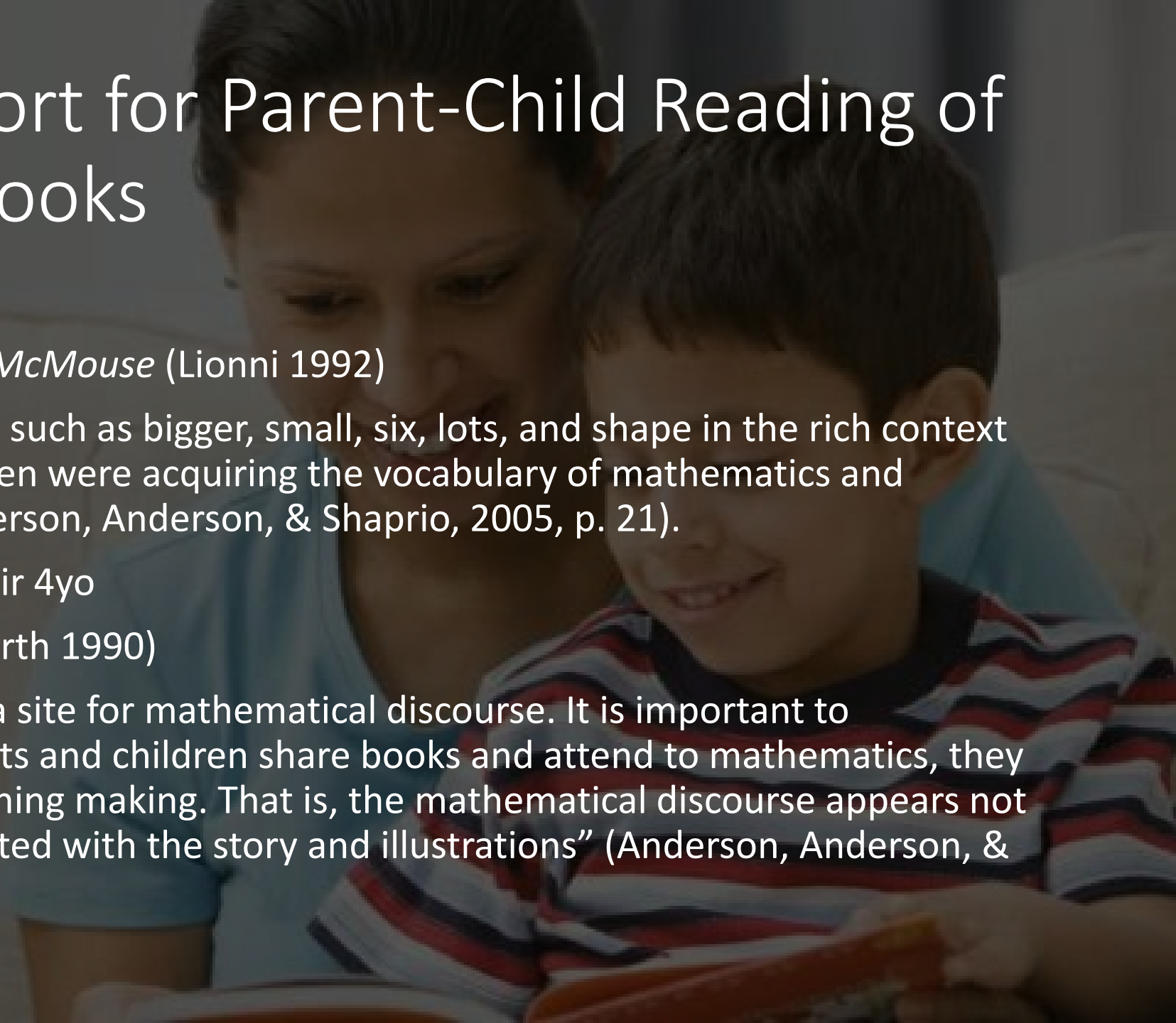
Research Support for Parent-Child Reading of Math Picture Books

1. 39 parents and their 4yo

- *Swimmy* (Lionni 1963), *Mr. McMouse* (Lionni 1992)
- “By being exposed to words such as bigger, small, six, lots, and shape in the rich context of storybook reading, children were acquiring the vocabulary of mathematics and associated meanings” (Anderson, Anderson, & Shaprio, 2005, p. 21).

2. 4 dyads of mothers and their 4yo

- *One Snowy Night* (Butterworth 1990)
- “Storybook reading can be a site for mathematical discourse. It is important to remember that when parents and children share books and attend to mathematics, they do so in the context of meaning making. That is, the mathematical discourse appears not to be contrived; it is connected with the story and illustrations” (Anderson, Anderson, & Shapiro, 2004, p. 28-29).



Take Home Math Book Bags

- Take a look at the book bags.
- Skim the books, discussion questions, and suggested activities.
- What other math concepts could be taught with this book?
- If time, trade with another group.





How to Prepare Take-home Bags

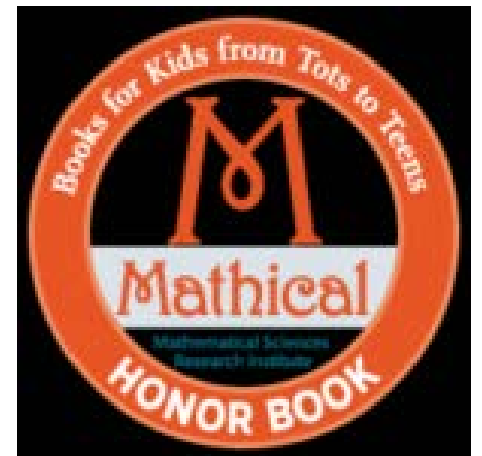
1. Choose a high-quality mathematics picture book.
2. Suggest simple hands-on activities with few materials.
3. Set up a check-out system that works for you.

Note: This is one way to get books and mathematics into the homes of low-income families.

Mathical Book Prize

www.mathicalbooks.org

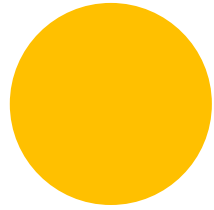
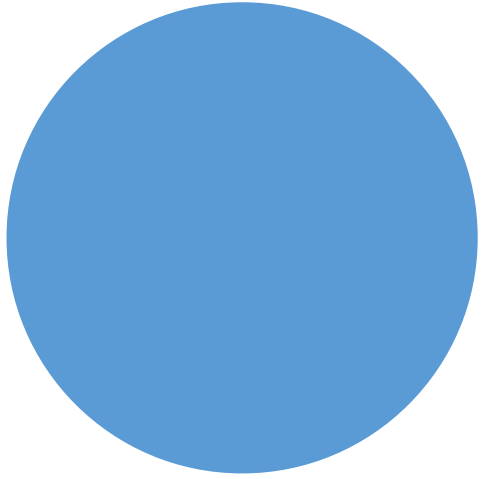
- Annual award for fiction and nonfiction books that inspire children of all ages to see math in the world around them.
- Awarded by the **Mathematical Sciences Research Institute (MSRI)**, in partnership with the **National Council of Teachers of English (NCTE)** and the **National Council of Teachers of Mathematics (NCTM)**, and in coordination with the **Children's Book Council (CBC)**.
- Use as a source of high-quality titles.
- We brought some samples of past winners!



Get Your Hands on a Few More Books

- Skim through a book.
- Find it on the handout and take a look at the teaching idea.
- Put a star by it if you like it!
- We'll share out in 5-7 minutes.

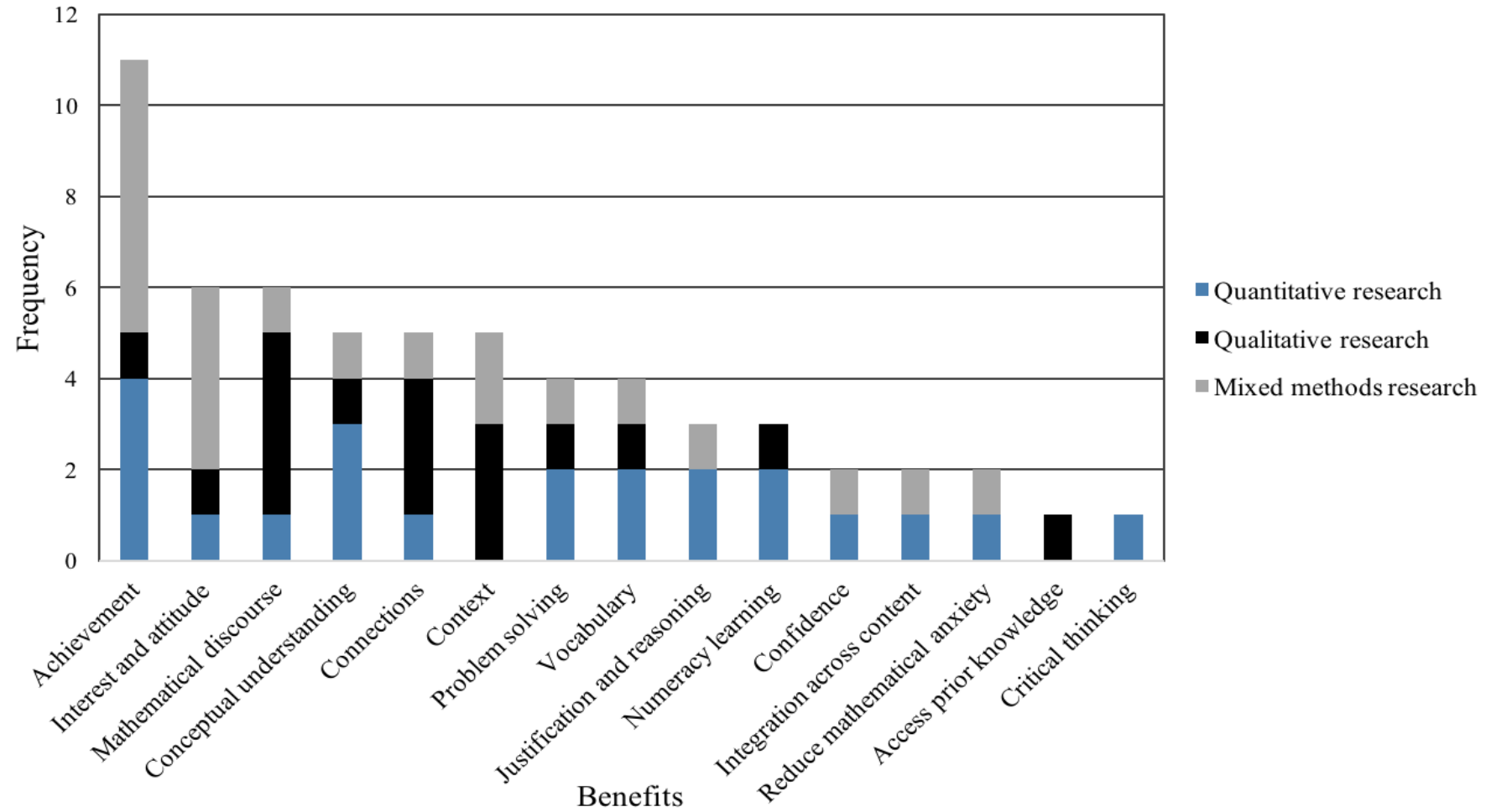




Think-Pair-Share Wrap-up

What titles did you add
to your sticky note?

Research-Based Benefits of Using Children's Literature to Teach Mathematics



Questions





Door Prizes!

Thank you for coming and
sharing our joy of books &
mathematics!

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