

# Building from Children's Mathematical Brilliance

## The Case of Counting

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#CountingCollections

# Thank you to our partners

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# Today

- Counting Collections
- Noticing and building from what children know and can do - what to look and listen for

# Counting Collections

Gather “collections” of objects in the classroom—shells, rocks, buttons, beads, craft sticks, unifix cubes, paper clips, pencils, etc.



Simple, inviting, accessible task for teachers and students - just count to figure out how many!

You can learn a lot more about students as you observe and listen to them count!

And you can help students build foundations for number and representation.



How many are in your “collection”?

Count with a partner or by yourself.

Represent how you counted your collection.









# Counting Collections

What learning opportunities are available within this task?

- Mathematical opportunities
- Social/collaborative opportunities

# Engaging a small group in Counting Collections





# Nicole counts frogs

<https://prek-math-te.stanford.edu/counting/additional-counting-videos>





# Aubree counts bears

<https://prek-math-te.stanford.edu/counting/additional-counting-videos>



# Scarlett counts tops

<https://prek-math-te.stanford.edu/counting/additional-counting-videos>



# Hazel counts pennies

<https://blog.heinemann.com/supporting-counting>



# Principled ideas in learning to count

## The Sequence of Number Words

- Counting involves using a consistent, ordered sequence of number names (the stable-order principle).
- Extending the number sequence involves making sense of the patterns of the base-ten number system.

## One-to-One Correspondence

- Exactly one number from the counting sequence is assigned to each object in the collection (the one-to-one principle).

## Cardinality

- The last number assigned to an object in counting the collection represents the total quantity of the collection (the cardinal principle)



# Recent research findings

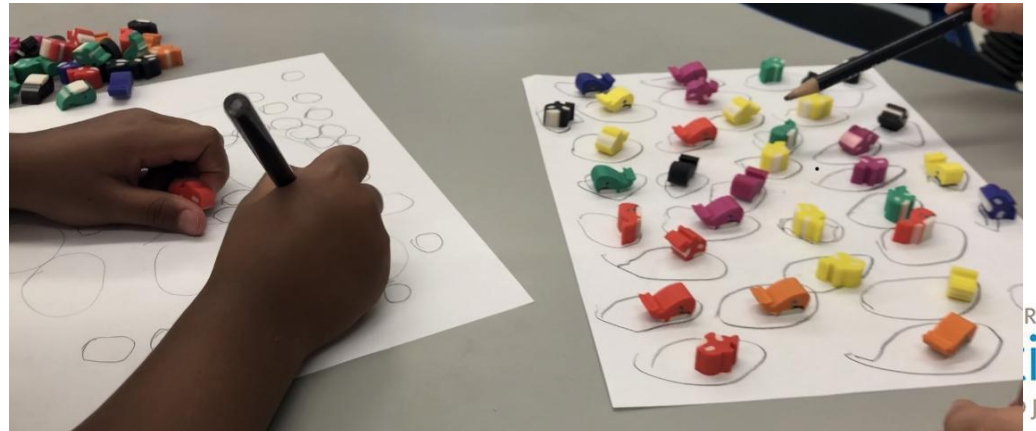
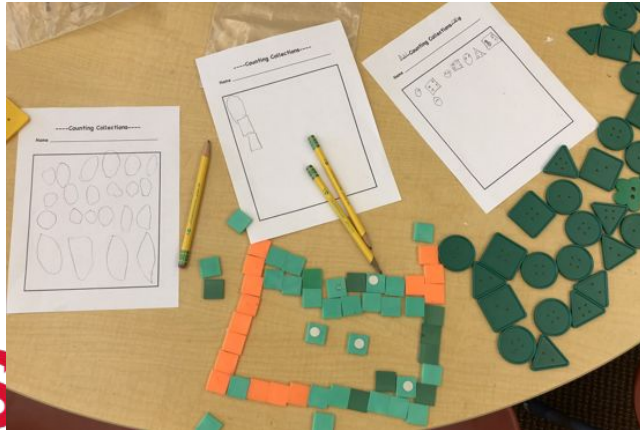
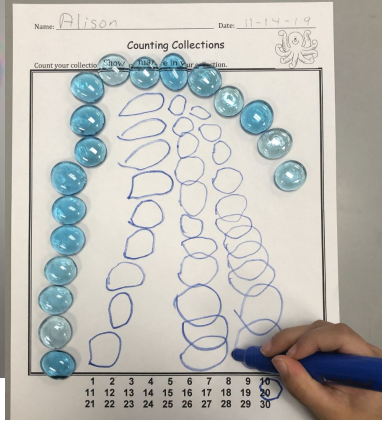
- counting principles do not develop in an isolated, sequential fashion... our data suggests a relational, concurrent view of development that does not take the same sequence for each child...
- more productive to characterize development in terms of a constellation of possible learning paths rather than as a singular, somewhat linear trajectory

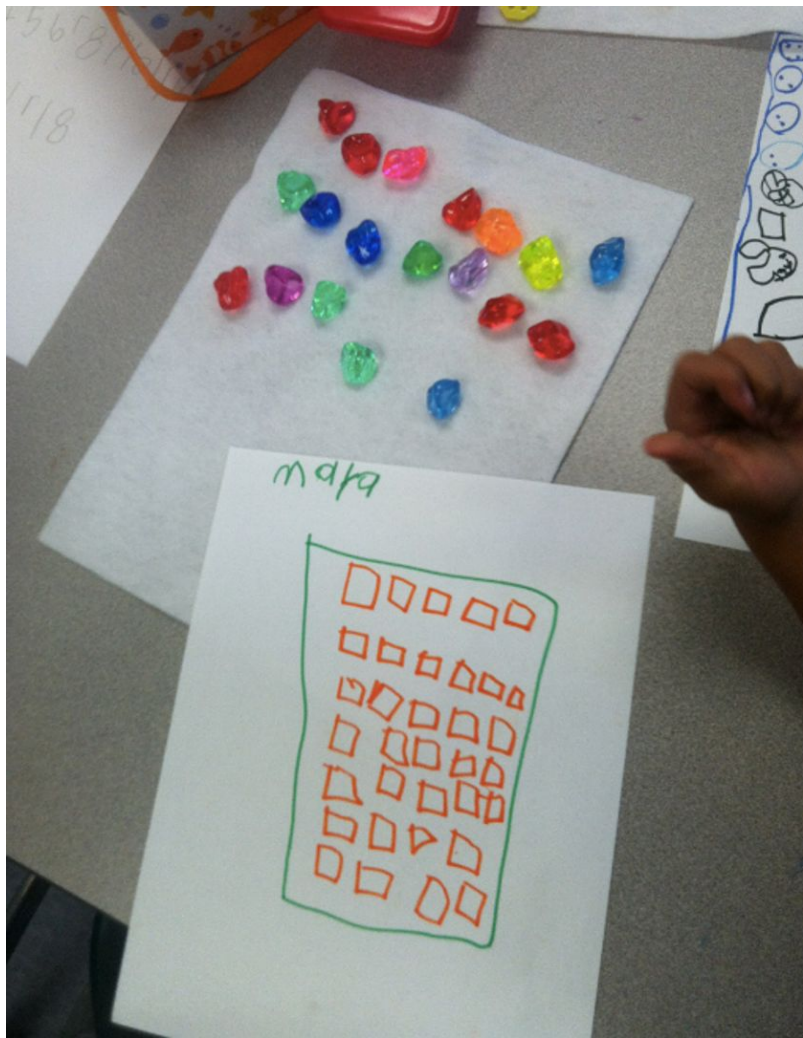
Johnson, N. C., Turrou, A. C., McMillan, B. G., Raygoza, M. C., & Franke, M. L. (2019). "Can you help me count these pennies?": Surfacing preschoolers' understandings of counting. *Mathematical Thinking and Learning*, 21(4), 237-264.

- children demonstrated emerging understandings of the structure of the number sequence within the teen numbers and beyond before consistently using the conventional, "correct" sequence
- children used parts of the teen sequence before using them accurately and, concurrently, often began using numbers in the twenties or thirties

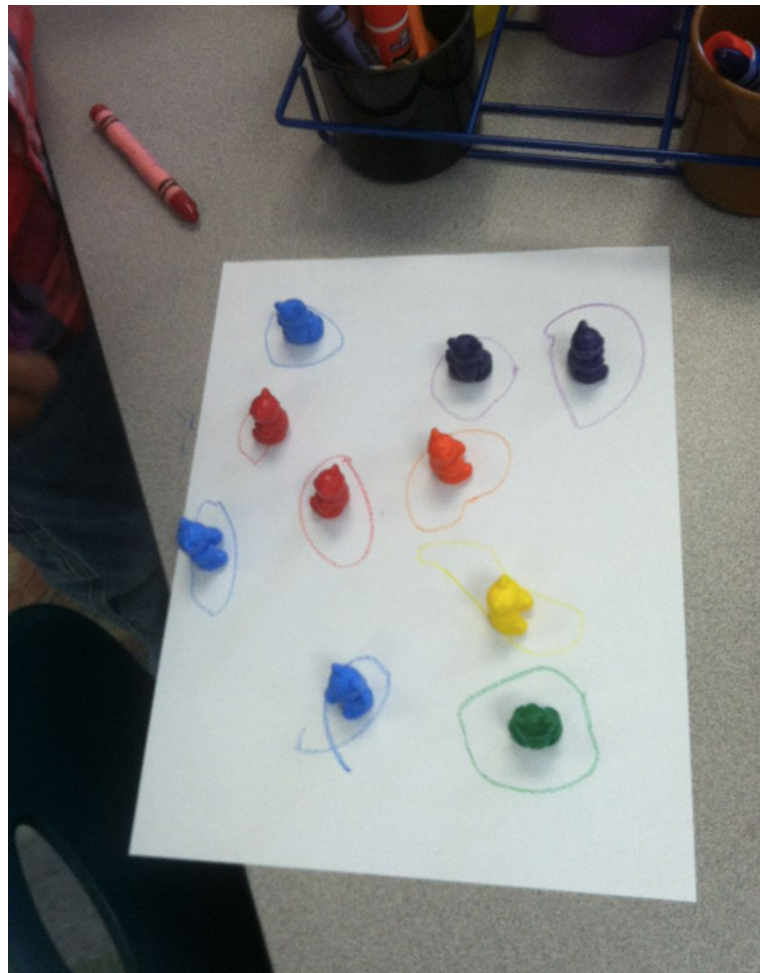
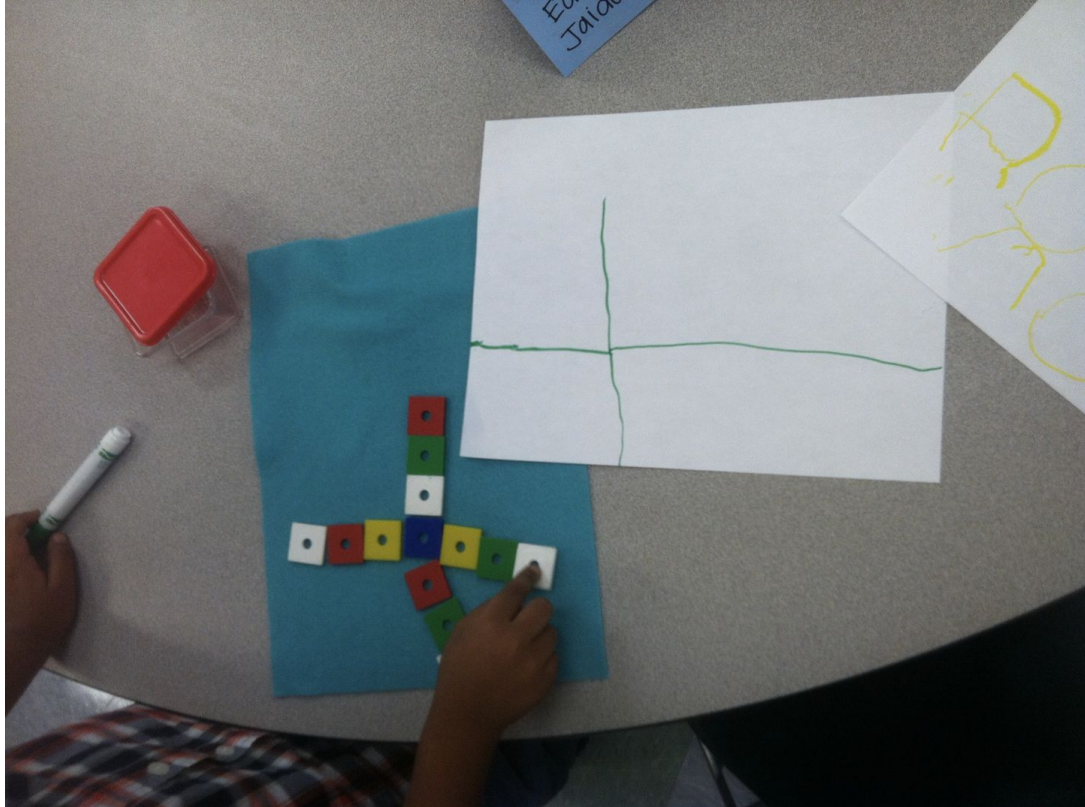
McMillan, B. G., Johnson, N. C., & Schexnayder, J. R. (2023). Beyond counting accurately: a longitudinal study of preschoolers' emerging understandings of the structure of the number sequence. *Mathematics Education Research Journal*

# Representing Collections



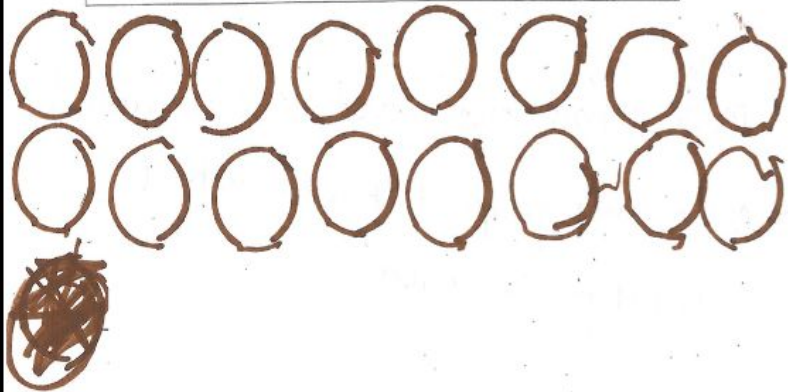




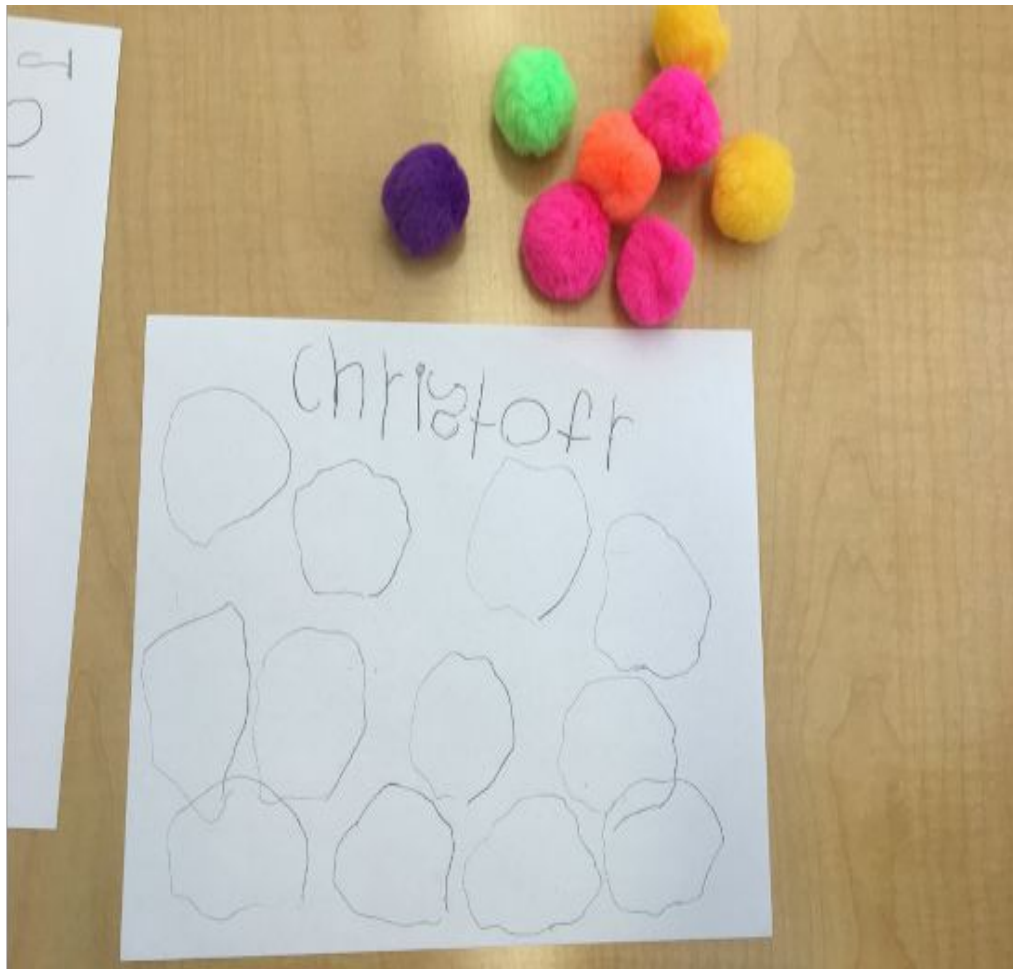


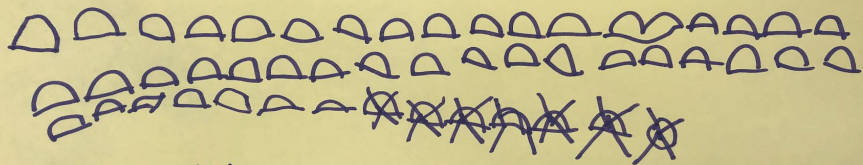


Counting Collection Recording



61





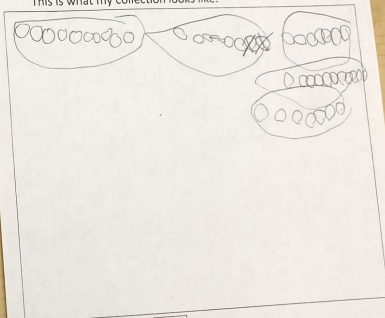
14



Name Halley Date \_\_\_\_\_

**Counting Collection**

This is what my collection looks like:



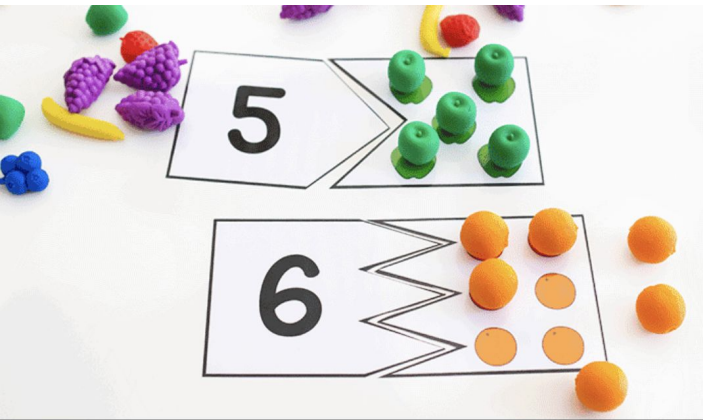
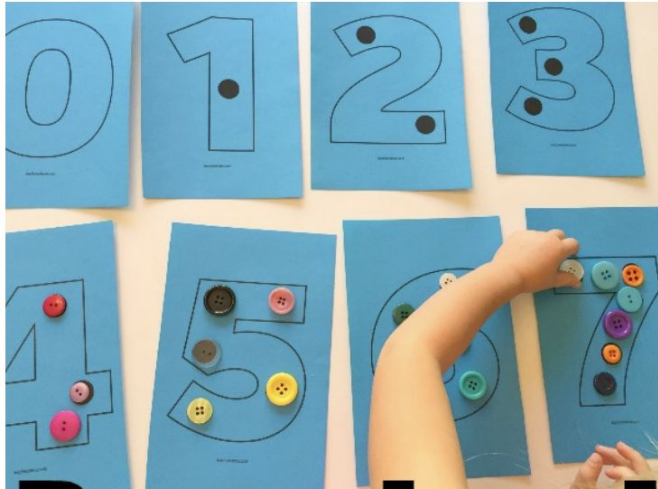
My collection has 14 objects.

I counted by \_\_\_\_\_.





broshas 14  
||||  
|||||

# How is Counting Collections different from other typical preschool tasks?



Count the number of pictures in each row and circle the correct number.

	4	7
	4	3
	5	7
	7	8
	1	2
	4	5

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## How many?





# Thank you!

<http://prek-math-te.stanford.edu>

<https://cmpso.org/>

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