

Counting and Cardinality

From Big Ideas of Early Mathematics

BIG
IDEAS



Counting and Cardinality

Sets

- Attributes can be used to sort collections into sets
- The same collection can be sorted in different ways
- Sets can be compared and ordered

Number Sense

- Numbers are used in many ways, some more mathematical than others
- Quantity is an attribute of a set of objects and we use numbers to name specific quantities
- The quantity of a small collection can be intuitively perceived without counting (subitizing)

Counting

- Counting can be used to find how many in a collection
- Counting has rules that apply to any collection

Idea:

Count children in line before coming in from recess: State the purpose (e.g. “Let’s see if everyone is here before going back to the classroom. We wouldn’t want to leave anyone behind.”) After the last child has been counted, repeat the last number word to emphasize cardinality (e.g. “... 23, 24. 24 children are in line.”) This simple, daily counting activity can be modified as mathematical understanding develops. Early in the school year, the teacher may want to “tag” each child on the shoulder as he/she is counted. Later, the teacher could switch to simply pointing toward the children (still modeling keeping track of what you are counting) as they are counted. When the children have a solid understanding of counting, they can number themselves off with the first child saying, “1” for him/herself and so on and so on until the last child numbers off. When the last child numbers off, the class would state the total number of children that had been counted.

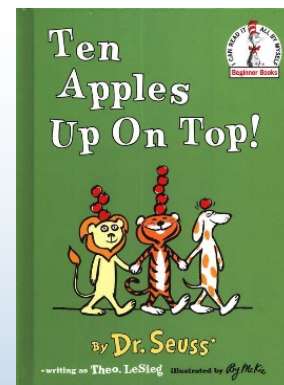
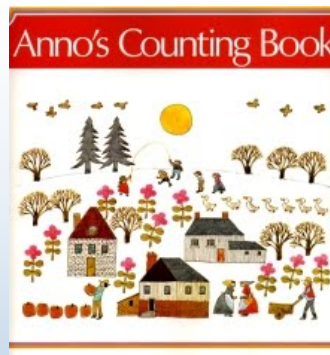
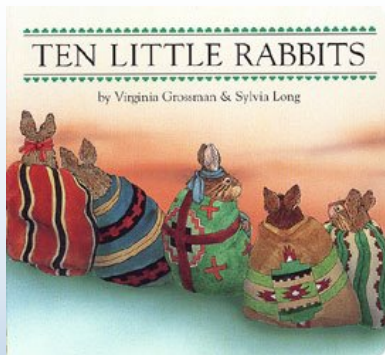
Opportunities that Encourage Counting

BLOCK AREA	MAKING PLAYDOUGH	MATH WARM UPS	VERBAL COUNTING PROCESS	OUTDOOR
Ask a child how many wooden blocks were used to build his/her structure. Then, ask the child to draw a replica of the structure with attention to how many blocks were originally used.	After measuring and adding the recipe ingredients, each child in the small group stirs the mixture 10 times and then passes it on to the next person.	Ask the children to use whole-body movements to signify various amounts (ex: tap rhythm sticks 18 times; hop 13 times; nod head 7 times)	Make any rote counting experiences fun by prompting children to count in different voices (ex: monster voices; happy/sad voices; quiet voices).	Ask children to shake off the sand from their clothes and shoes a certain amount of times (ex: stamp your left foot 6 times; brush your legs off 10 times).

Library Books that Encourage the Development of Counting and Number Sense:

10 Black Dots by Donald Crews
Count and See by Tana Hoban
Splash by Ann Jonas
Each Orange Had 8 Slices by Paul Gianti, Jr.
Anno's Counting Book by Mitsumasa Anno
100 Hungry Ants by Elinor J. Pinczes
Fish Eyes: A Book You Can Count On by Lois Ehlert
Ten, Nine, Eight by Molly Bang

Mouse Count by Ellen Stool Walsh
10 Apples Up on Top by Dr. Seuss
Dinner at the Panda Palace by Stephanie Calmenson
Eggs and Legs: Counting by Twos by Michael Dahl
On the Launch Pad: A Counting Book about Rockets by Michael Dahl
This Jazz Man by Karen Ehrhardt
Ten Little Rabbits by Virginia Grossman & Sylvia Long





Counting Songs:

- “Ten in the Bed”
- “Five Little Ducks”
- “Five Green and Speckled Frogs”
- “Five Little Monkeys Jumping on the Bed”
- “One, Two, Buckle My Shoe”
- “This Old Man”
- “The Ants Go Marching”

Helpful Counting Vocabulary and Definitions:

rote counting reciting the number names in order from memory

rational counting matching each number name in order to an object in a collection

subitizing skills the ability to perceive a small amount of objects and know “how many” there are without counting

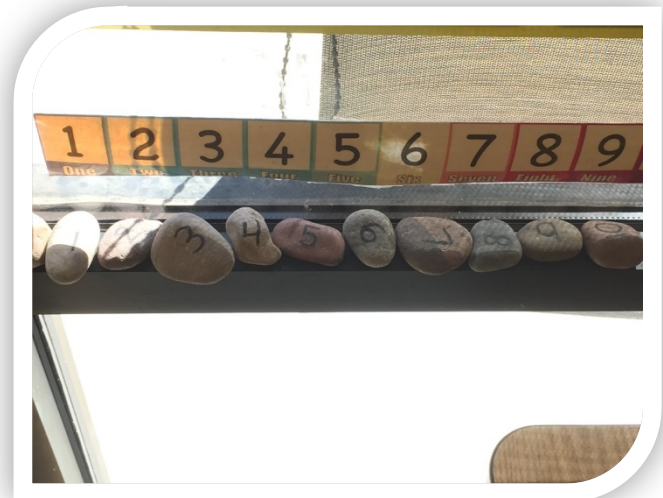
one to one correspondence principle one number is named for each object

ordinal numbers refer to the position in a sequence (e.g. first, second, third)

cardinal numbers provide the answer to the questions “how many?” and “how much?”

number sense (definition for our purposes) the ability to understand the quantity of a set and the name associated with that quantity

set any collection that is grouped together in some meaningful way



ADDITIONAL EXAMPLES OF ACTIVITIES THAT ENCOURAGE COUNTING & CARDINALITY

