



Professional Learning Module
Mathematical Thinking: Rethinking Calendar Time

Big Ideas of Counting

Counting is part of young children’s daily life. We count because we want to know “how many.” Counting seems to be very simple but it is really quite complex. *How much and how many* are fundamental questions that are embedded in our everyday life.

Understanding *how many* is a complex developmental process, which is closely related to the development of number sense. Children need to have a good sense of number and understand the quantity of a set and the name associated with that quantity. (I see three, I can write the numeral 3, I know three is more than two.) Cardinality is knowing “how many” and is the primary purpose of a counting activity. It helps children carry out number operation activities meaningfully. Rational counting takes place only after children have mastered the four key principles or “rules” for counting.

Principle	Example	Activities and Routines
Stable Order	Counting words have to be said in the same order every time.	<ul style="list-style-type: none">Counting songs and movement gamesCounting up and back from any numberPost and reference a 1-10 number line
One-to-One Correspondence	One number is named for each object	<ul style="list-style-type: none">Daily routines - passing out this and thatMusic/movement – marching to a drum beatBoard games with a path to move along.
Order Irrelevance	No matter what order the items are counted, the result is the same	<ul style="list-style-type: none">Starting counts of a fixed set beginning in different places, for example taking attendance.Arrange and rearrange sets to confirm count.Groups objects for more efficient counting
Cardinality	Understanding that the last number counted tells how many objects have been counted	<ul style="list-style-type: none">Labels small sets by quantityCounts out a given number of items for snackBe sure to ask “how many?” after a child has counted.

There are two types of counting:

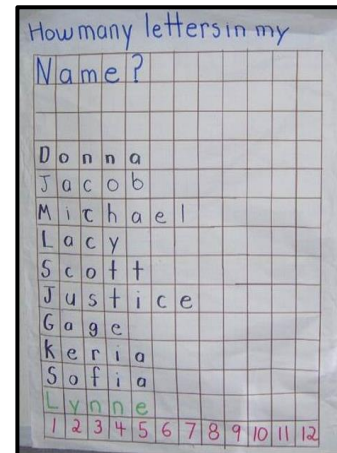
- Rote counting** involves reciting the number names in order from memory. 21, 22, 23, etc. Rote counting has its place in the process of learning to count, but its function is rather limited.
- Rational counting** involves matching each number name, in order, to an object in a collection (one apple, two apples, etc.). Rational counting skills arm children with a tool that enables them to understand the concept of numerosity, to compare quantities of different sets, and eventually to engage in number operations. Rational counting is the foundation for children’s early work with numbers.

Full rational counting with a strong grasp of cardinality up to 10 is a process that takes usually two to three years to develop. For most children, rational counting starts to show up at the end of preschool or beginning of kindergarten. In kindergarten, many children master good number sense to about 20-25. Developmentally, most kindergarteners and even some first graders do not have a precise idea of “how many” numbers over 50 and 100 really represent. This has some serious implications for teaching. Teachers may not realize that a child who can count to 100 may understand “how many” ONLY in quantities under 20 or 10.

Overemphasizing rote counting to high numbers before the counting principles are established for small numbers is counterproductive.

REMEMBER, counting has to be meaningful to children.

It is important to provide children with authentic reasons to count, that is, they need to count with a purpose using meaningful activities (daily routines, outside play, meals, washing hands, etc.) and real problem situations that encourage children to use counting in a meaningful way.



Source: *Big Ideas of Early Mathematics* Chapters 3; Early Math Collaborative; Erikson Institute, Pearson Education, Inc. 2014