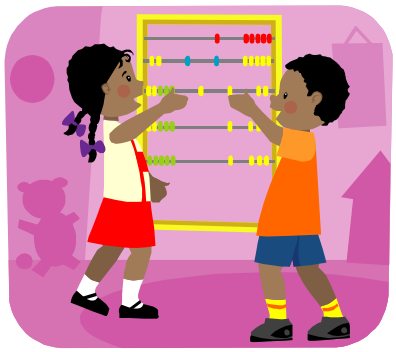

Kindergarten

5 Principles of Counting

MACCSS Standards Being Addressed:

Counting and Cardinality K.CC

Know number names and the count sequence.

K.CC.1. Count to 100 by ones and by tens.

K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

K.CC.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

Count to tell the number of objects.

K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

c. Understand that each successive number name refers to a quantity that is one larger.

K.CC.5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

Rational:

Learning to count is the foundation for a student's success with math. There is a whole lot more to counting than starting from the number one and this reference sheet will help with all that goes into a solid understanding of counting.

The basics to know about counting!

Based on the research of Gelman and Gallistel taken from "The Principal Counting Principles" by Ian Thompson

1. The one-one principle

This involves the assigning of one, and only one, distinct counting word to each of the items to be counted. To follow this principle, a child has to be able to partition and re-partition the collection of objects to be counted into two categories: those that have been allocated a number name and those that have not. If an item is not assigned a number name or is assigned more than one number name, the resulting count will be incorrect.

2. The stable-order principle

To be able to count also means knowing that the list of words used must be in a repeatable order. This principle calls for the use of a stable list that is at least as long as the number of items to be counted; if you only know the number names up to 'six', then you obviously are not able to count seven items. So, a child who counts 1, 2, 3 for one particular collection of three objects and 2, 1, 3 for a different collection cannot be said to have an understanding of the stable-order principle – although such a child would appear to have an understanding of the one-one principle. However, a child who repeatedly counts a three-item collection as 2, 1, 3 does appear to have grasped the stable-order principle – although, in this case, has not yet learned the conventional sequence of number names.

3. The cardinal principle

This principle says that, on condition that the one-one and stable-order principles have been followed, the number name allocated to the final object in a collection represents the number of items in that collection. To be considered to have grasped this principle, a child needs to appreciate that the final number name is different from the earlier ones in that it not only 'names' the final object, signaling the end of the count, but also tells you how many objects have been counted: it indicates what we call the numerosity of the collection. If a child recounts a collection when asked how many objects there are, then they have not yet grasped this principle.

4. The abstraction principle

This states that the preceding principles can be applied to any collection of objects, whether tangible or not. Obviously, for young children learning to count it is easier if the objects are tangible and, where possible, moveable, in order to help them to distinguish the 'already counted' from the 'yet to be counted' group. To understand this principle, children need to appreciate that they can count non-physical things such as sounds, imaginary objects or even the counting words – as is the case when 'counting on'.

5. The order-irrelevance principle

This principle refers to the knowledge that the order in which items are counted is irrelevant. It does not really matter whether the counting procedure is carried out from left to right, from right to left or from somewhere else, so long as every item in the collection is counted once and only once.