

# The Counting Principles

Following research from Gelman and Gallistel in 1978, it is vital that teachers understand the five counting principles. (Gelman, R. & Gallistel, C. (1978) *The Child's Understanding of Number*. Cambridge, MA. Harvard University Press.)



The one-one principle. This involves children assigning one number name to each object that is being counted. Children need to ensure that they count each object only once ensuring they have counted every object.

Children will sometimes count objects more than once or miss an object out that needs to be counted. Encourage children to line up objects and touch each one as they count saying one number name per object. This will also help to avoid children counting more quickly than they touch the objects which again shows they have not grasped one-one correspondence.

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The stable-order principle. Children understand when counting, the numbers have to be said in a certain order.

Children need to know all the number names for the amount in the group they are counting. Teachers can therefore encourage children to count aloud to larger numbers without expecting them to count that number of objects immediately.

3

The cardinal principle. Children understand that the number name assigned to the final object in a group is the total number of objects in that group.

In order to grasp this principle, children need to understand the one-one and stable-order principle. From a larger group, children select a given number and count them out. When asked 'how many?', children should be able to recall the final number they said. Children who have not grasped this principle will recount the whole group again.

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The abstraction principle. This involves children understanding that anything can be counted including things that cannot be touched including sounds and movements e.g. jumps.

When starting to count, many children rely on touching the objects in order to count accurately. Teachers can encourage abstraction on a daily basis by counting claps or clicks. They can also count imaginary objects in their head to encourage counting on, this involves the children visualising objects.

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The order-irrelevance principle. This involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number.

Encourage children to count objects, left to right, right to left, top to bottom and bottom to top. Once children have counted a group, move the objects and ask children how many there are, if they count them all again they have not fully grasped this principle.

# Key Language for Teachers

**Cardinal** - The number that indicates how many there are in a set.

**Classification** – The identification of an object by specific attributes, such as colour, texture, shape or size.

**Conservation** (of number) – The recognition that the number stays the same if none have been added or taken away.

**Numeral** - The written symbol for a number; e.g. 3, 2, 1

**Ordinal** - A number denoting the position in a sequence e.g. 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, etc or page 1, page 2, page 3...

**Partition** - Separate a set into two or more subsets e.g. Partition a set of socks into plain and patterned.

**Subitise** - Instantly recognise a small quantity, without having to count how many there are.

**Number** - Number can be:

- a count of a collection of items e.g. three boxes,
- a measure e.g. of length or weight, or
- a label e.g. the number 17 bus

**Quantity** - The amount you have of something e.g. a cup of flour, three boxes, half an hour.

# Key Representations

## Notes and Guidance

When teaching counting, consider the counting principles at all times. At this early stage, ensure that children are counting real-life objects. They could start by subitising and counting objects that are identical before moving on to subitising and counting objects that have slight differences such as size or colour. Make sure that the objects are of the same type e.g. apples, cubes, books.

Encourage children to put objects into a line when counting so they have a clear start and end point.

The five frame can be used to support children to **subitise** and compare numbers within 5

Numerals may be introduced to children but they are not expected to write them at this stage. They could use informal jottings and/or drawing to record their thinking.