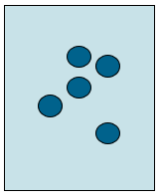
Practitioner Prompts: Subject Knowledge for Counting

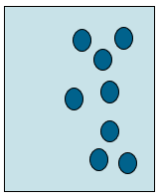
Subitising

Subitising is the ability to recognise how many objects are in a small set without counting

Perceptual subitising is recognising a quantity without using other mathematical processes (typically up to 5 objects)



Conceptual subitising is recognising the number pattern as a composite of parts and whole (for example perceiving a group of 5 and a group of 3 to subitise, or recognise, 8 without counting)



Number conservation

The quantity does not change despite the physical arrangement of the objects

Hierarchical Inclusion

A number contains all of the previous numbers. This is important in understanding part-whole relationships (for example 4 is 3 and 1)

Numerals

There are 10 numerals (0-9) or digits (single symbols). These are used to make an infinite amount of numbers (e.g. 397 or 17 or 100392)

Numerosity

A sense of quantity or numerical intuition

Verbal Counting

The ability to say (or recite) the number names in order:

- String counting (no individual words)
- Unbreakable list (always from start)
- Breakable list (from any point)

Object Counting

The ability to count objects requires 5 key elements:

Stable-order: the numbers must always be in the same order
One to one: consistently match one item to number word and count each item once
Cardinal: the quantity or total number in a set
Abstraction: any collection of items can be counted as a set (the items can be very different from each other)
Order irrelevance: the result is the same no matter which order the items are counted

Counting for cardinality

It is important that children know when their purpose of counting is to find how many.

The **cardinal number** (last number word) represents how many have been counted and gives the cardinal value of the group (for example, the number of objects is 4 rather than the entire sequence:1,2,3,4).

Counting from a larger **group of objects is important** for children to avoid then merely repeating the last word of the count with no clear idea that it relates to quantity. Cardinality is important for knowing the relative size of numbers (more or less).

Phases of development of the cardinal principle:

1. Repeating the last number
2. Relating the last number to quantity
3. Progressive nature of cardinality (can stop mid-count and know how many so far)
4. Compare sizes of numbers – the next number represents a larger quantity

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