

Counting with Miss Count

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In two research reviews – What works for children with mathematical difficulties? (DfES, 2004 and DCSF, 2009) - Ann Dowker describes a range of ways suggested in the literature for dealing with the difficulties experienced by children learning mathematics. This article offers a different approach based on the research reported in Issue 8 of the Early Years Magazine, which described a three-part counting theory that incorporated the concepts of oral counting, enumeration and counting for cardinality.



Researchers have found that one way around the problem of generating meaningful discussion with young children is to introduce a 'naughty teddy' or some similar device. They consider that children are more likely to argue with or correct the mistakes made by a puppet than they are to confront or question an adult authority figure. Using this research idea for teaching purposes can generate stimulating learning experiences. The class is introduced to Miss Count, a puppet, whose favourite pastime is counting. Unfortunately, however, she is not particularly adept at it, and the children are invited to point out and help correct any mistakes that she might make.

Oral counting

The following suggestions for possible errors to be made by Miss Count are based on those mistakes that young children have been found to make when learning to recite the counting numbers:

one, two, four, five ... (word omitted)

one, two, three, five, four, six ... (words in the wrong order)

one, two, three, three, four ... (repeating a word)

three, four, five ... (not starting from the beginning)

... thirteen, fourteen, fiveteen ... (error by analogy)

... eighteen, nineteen, tenteen ... (error by analogy)

... twenty-nine, twenty-ten ... (error by analogy)

When children spot Miss Count's 'miscounts', they can explain to the rest of the class why the puppet is incorrect, and the ensuing discussion can provide useful feedback for the class teacher on individual children's level of understanding. The activity also helps to improve the recitation skills of those children who are having difficulty mastering the sequence.

To make sense of the system, children need to appreciate that words such as x-ty-nine signal a change in the structure of the sequence, and that the sequence as a whole is a repetitive system. Even when they have come to understand that x-ty-eight, x-ty-nine ... is followed by a different x-ty, x-ty-one, x-ty-two ... children often do not know the order of the x-ty words. Some practice in reciting the multiples of ten is a useful way of developing this necessary knowledge. Miss Count can also be used to focus on these particular aspects of the counting process. For example, she might incorrectly count ... twenty-eight, twenty-nine, forty ... – offering the wrong multiple of ten – or she could count in tens reciting the decade numbers in the incorrect order. However, Miss Count occasionally needs to gets things right!

Enumeration

Enumeration involves assigning the correctly ordered number words in one–one correspondence with the objects being counted. Most children point to the objects that they are counting. There are 'visual counters' who 'point' with their eyes; 'digital counters' who point with their fingers; 'touch counters' who touch the objects but do not displace them; and 'physical partitioners' who move the objects – where possible – while counting them.

Since physical partitioners make fewer errors than children in the other categories, it is important children be guided to point with their fingers rather than their eyes, and be encouraged to touch and move the objects that they are counting. Both these procedures help children keep track of their counting, leading to the elimination of some of the potential enumeration errors.

There are three different contexts for error: recitation, coordination and keeping track. To be successful in their counting, children have to coordinate the recitation of the number words with the physical act of pointing while at the same time ensuring that each object is counted once and only once. Miss Count can be used to provoke discussion among the children by making the following enumeration mistakes:

getting the recitation and the pointing completely out of synchronization

pointing to one of the objects without saying a number word at the same time and then continuing correctly

saying a number word without pointing at a specific object and then continuing correctly

pointing at the space between objects and assigning number names to these spaces

coordinating the recitation with the pointing but missing out one of the objects

coordinating the recitation with the pointing but counting one object twice.

Counting for cardinality

The following four activities are useful for generating discussion about this aspect of the counting process:

Miss Count correctly enumerates a collection of, say, six objects; the teacher asks her 'How many are there?'; Miss Count proceeds to recount; and the teacher asks the class 'Does she need to count them again?'

Instead of re-counting the six objects the puppet says 'There are seven' (or some other incorrect number)

The teacher asks the Miss Count to count out six objects from a larger collection; the puppet silently removes objects one at a time but stops after the fifth (or some other number)

Asked to count a collection of three objects Miss Count points at the three objects in turn, saying 'Two, three, four... There are four'. (This activity relates to the research of Bermejo et al. (2004) mentioned in Issue 7 of the Early Years Magazine).

References

Bermejo, V., Morales, S. and Garcia de Osuna, J. (2004) Supporting children's development of cardinality understanding, *Learning and Instruction*, 14: 381–98.

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