Educating Together
One-stop educational support for your family

Dyscalculia: An Introduction and Recommended Resources

The DfES (2001) defined developmental dyscalculia as:

....a condition that affects the ability to acquire arithmetical skills. Dyscalculic learners may have difficulty understanding simple number concepts, lack an intuitive grasp of numbers, and have problems learning number facts and procedures. Even if they produce a correct answer or use a correct method, they may do so mechanically and without confidence.

Most of us are born with the ability to recognise and mentally manipulate numbers in a set, which forms the basis of understanding numbers and arithmetic.

One hypothesis is that developmental dyscalculia is a consequence of being dyslexic as dyslexics often have problems with short-term memory, with language, confuse b/d and have attentional and organisational difficulties. These could cause a delay in learning maths. However research suggests that dyscalculia is a separate deficit.

It is generally agreed that children with dyscalculia have difficulty in learning and remembering arithmetic facts and carrying out calculation procedures. Dyscalculics depend on simple strategies such as counting on their fingers to solve problems.

Studies have found very high co-morbidity, with between 20 and 60 percent of developmental dyscalculics also having difficulties in reading or spelling. Other conditions that have been associated with developmental dyscalculia are ADHD, poor hand-eye co-ordination and poor memory for non-verbal material.

Children with poor attention, working memory or spatial skills may find maths difficult because of their cognitive difficulties, but this doesn't mean they are dyscalculic. This is important to note, since these children can really improve their maths with appropriate support in a way that children with dyscalculia are unable to do so.

Dyscalculia appears to be heritable, although not all cases are inherited.

The learning implications

Dyscalculic children have very poor intuitive number sense; they don't have a natural feel for quantities of numbers. They don't see numbers as they are; they see small numbers as small groups of ones and large numbers as large clumps of ones. Their understanding of number remains static and extremely poorly developed and largely ones-based.

The consequences are very serious as they do not visualise numbers in helpful ways, do not learn numbers as patterns (6 is 6 ones and also 3+3) and find it hard to see the structures within numbers (24 = 24 ones and also 2 tens and 4 ones).

They do not easily picture the overall base ten structure of the number system. (39 = 39 ones, but it is also 9 more than 30 and 1 less than 40).

This inadequate grasp of the foundation understandings and poor number concept, has a profound effect on the way that children with dyscalculia do maths.

Dyscalculics often make small amounts of progress in maths:

- They seem unable to hold onto or retain what they have learned
- They keep reverting to unitary understandings of numbers
- They keep forgetting the facts and procedures they have learned and return to counting- based solutions
- They frequently forget entire areas of number work

The emotional implications of dyscalculia

It takes a great deal of effort for children with dyscalculia to think about numbers, they find it demoralising that they constantly forget what they learn and don't get very far in learning about numbers. For these reasons most children with dyscalculia do not enjoy number work, feel discouraged in maths lessons and develop avoidance strategies, such as going to the toilet and sharpening pencils.

Dyscalculic children may be teased, bullied or pitied by other children and sometimes shouted at by parents and teachers who do not understand the difficulties that dyscalculics face. This can leave dyscalculic children feeling anxious and stupid.

How to help dyscalculic children

Children need a carefully designed teaching programme that is structured, encourages active participation and make maths a learning positive experience.

Numbers are very abstract; dyscalculics are able to make much better sense by using concrete materials to make the work more transparent.

In the Educating Together Shop, parents are able to buy: **'Dyscalculia Guidance'** a superb teaching guide by Professor Brian Butterworth and Dorian Yeo, providing step-by- step instructions on how to give lessons to children with maths difficulties.

The Shop also contains the maths packs and resources to accompany this guide so parents can provide immediate support for their children who may be dyscalculic, or simply experience maths difficulties.

Please note these materials are suitable and appropriate for all children, as well as children with maths difficulties.