

the strange & wonderful dyscalculia

By Frances Adlam*

Out of all the 'dys' thingy-ma-bobs around at the moment, dyscalculia must be the trickiest to say and the least known about. So what is this strange condition? And are there ways to help at home?



One way to think of dyscalculia, in simple terms, is that it is the dyslexia equivalent of maths. Dyscalculia means a disorder in understanding calculation. And if, like me, you do not like the term disorder, the term difficulty can be used instead.

Parents will know that mathematics has changed in the past 5–10 years (depending on where you live and what school your child goes to). It is true that 2 plus 2 still equals 4, and 4 times 5 still equals 20. So, of course, the facts have not changed. What has changed is the way mathematics (or numeracy as it is now more often called) is taught.

Numeracy is now taught in a conceptual way. Children are expected to understand the underlying connections between number and the four mathematical operations. So, much to the dismay of many a parent, times tables, as an example, are not learnt by rote anymore; instead children learn about repeated addition and arrays to really grasp what 4 groups of 5 means. (An array is a means of grouping objects into lines: columns or rows. Natural arrays would be egg cartons and ice cube containers.) In this example, a child may have four lines and in each line there are five dots.

what has this all got to do with dyscalculia?

Well in the olden days, as the children refer to it, when you and I were kids, we learnt maths either by rote (many of us remember the onerous task of chanting our times tables everyday) or by failproof methods such as algorithms. This meant that even if you were predisposed to struggle at mathematics, you were taught methods that enabled you to grasp the basics.

Now, children are expected to understand about number, patterns and relationships between the two. Having taught children that have mathematically-wired brains, this 'new' way of teaching numeracy can be inspirational to watch.

Parents will know that wonderful feeling when a child blurts out the connection that they see: "Look $10-7=3$ and $3+7=10$." Generally speaking, with good teaching, those connections just keep on coming. This is not so for the child with dyscalculia. Their brain is wired in such a way that they only infrequently make such connections. Most of the time the teacher or parent has to unpack the operation further and build it up again slowly. Furthermore, this may have to be repeated and unpacked in different ways, many times.

Just like the child who struggles to remember the spelling of words due to dyslexia, the child with dyscalculia struggles to remember facts or strategies for numeracy. It can be extremely disheartening for an adult working with a child to unpack a concept many times, until the child understands it, only for the child to forget it all the next day.

So, for children who have dyscalculia, this new way of teaching numeracy could be considered a disaster. Let's think why this might be.

For the brain to be good at mathematics, it requires strong wiring in the following:

- Number sense
- Visual spatial skills
- Working memory
- Long term memory
- Concentration

In simple terms, this is where the problem lies. All the criteria required to make connections between patterns, numbers and operations (3×4 is the same as $4 + 4 + 4$) is the very same criteria that children with dyscalculia are weak in. The chief one of these is number sense.

Number sense is the amorphous ability to grasp that: 7 is less than 9, that if $5 + 5 = 10$: $5 + 7$ has to be more than 10. Numeracy is taught in such a way in our schools that some number sense is assumed, understandably, to be wired into the child's brain.

For children with dyscalculia, the number sense is not wired into the brain. It has to be explicitly built up by teachers and parents, and here are some brief, but extremely important, ideas on how to do that:

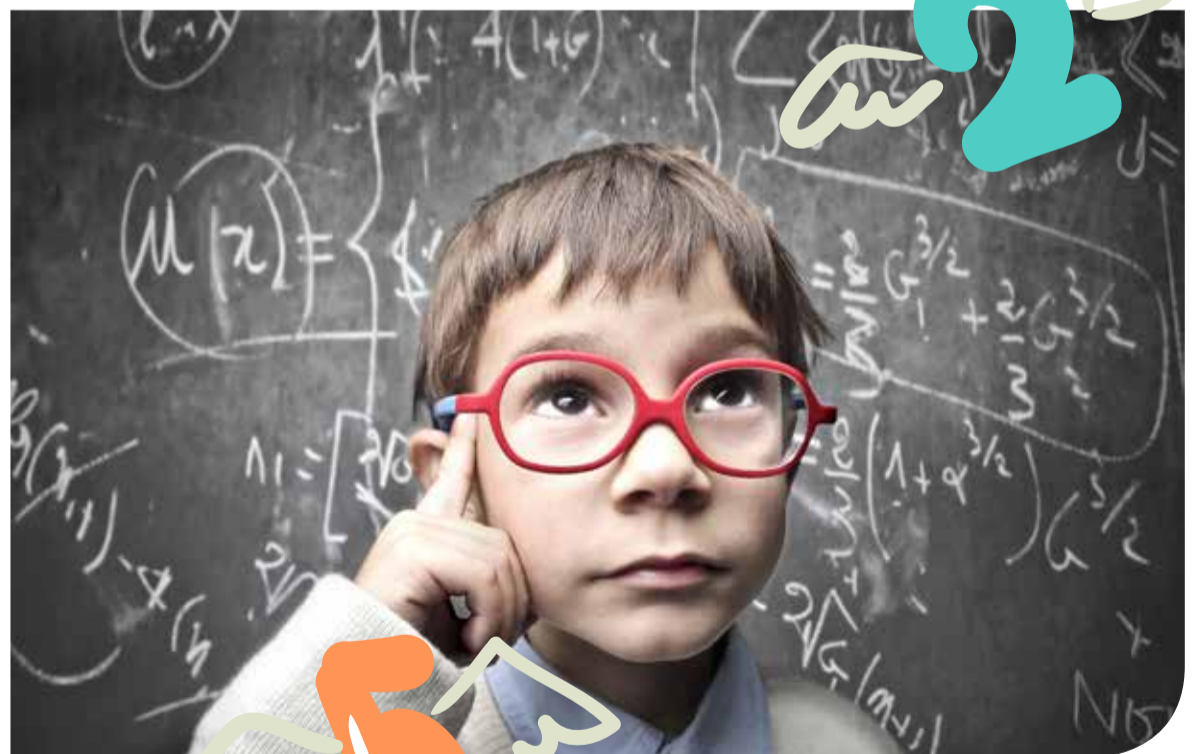
- Let children play with number and get the 'feel' for it. Have a relaxed experience time with: Cuisenaire rods, blocks, ten rods and one blocks.
- Let maths be about doing: cutting sandwiches into fractions, baking, weighing, and making necklaces in patterns of 3 or 4 beads.
- Have wonder moments as much as possible, where you wonder out loud to yourself: "Hmm, there are 3 children here and 8 biscuits what shall I do?"
- When teaching a new concept: play, show, model and let the child experience having a go.
- Acknowledge feelings: for many children, it can feel very 'unsafe' to move on from using fingers or 1 to 1 counting,

to counting on in the head. Make experiences playful and non-threatening.

- When a child is finding basic facts tricky, do not keep them there forever – let them experience fractions, weight, measurement or other mathematical concepts. (One way to put a child off mathematics for life is to narrow maths down to the one thing some children will always struggle with, such as basic facts.)

Arrays and ten grids are wonderful ways of working with number for those children who struggle with it. It may just mean more practice, more time and more experiences for such children. It may mean having flexibility over some of the new ideas that seem to go hand in hand with the new numeracy, such as knowing basic facts in a specific time. (For a child with dyscalculia getting them to know and understand their basic facts is achievement enough. To spend months (years!) worrying whether the child answers in 4 seconds instead of 2 seconds (which does happen in some schools) is to take the child out of the equation (excuse the pun.) Parents should remain responsive to the individual needs of their child so that they can rise to their best potential.

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