

Guide For Teaching

Your Dyslexic Child  
to **Do Math**  
From Home



**ebook**

By Liz Dunoon

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# Guide For Teaching

## Your Dyslexic Child To Do Math

### From Home

By Liz Dunoon

#### A story from me to start

I've got dyscalculia, there's no doubt about it. If somebody asks me to divide the bill after 13 of my friends have just eaten at a restaurant, my heart starts to beat a little faster and my brain scrambles – even though I know I can do it.

I have just never felt like I was any good at math. I always took longer, had to work harder and needed somebody to draw me a picture or explain it 10 different ways before I could finally understand a mathematical concept.

I still have bad memories of my grade four teacher. He made my life a living hell. I was nine-years-old and in a grade four, five and six composite class. Under pressure to teach all three grade levels, my teacher stood out the front of the classroom continually writing up maths problems on the chalkboard. He would go from fractions to decimals to three-digit addition to worded problems and I could never keep up.

He called my mum in and told her I was obviously blind. She took me for a test and I wasn't. He then called her in a

second time and told her I was deaf. Mum again took me for a test and, of course, I wasn't. He just couldn't teach me and as all children do, I assumed I was the dumb one.

Later that year I developed a new skill - going to the toilets to pretend I had vomited so I could go home. One morning I even drew grey lead pencil dots on my face pretending I had some horrible disease so I didn't have to go to school. My mum saw through that trick and, seeing how down I was, she organised a day off. She took me to see a double feature at the local cinema, *The Sound Of Music* followed by *My Fair Lady* and I loved her for it. My teacher was horrified that I had been allowed to waste a day on such a frivolous activity, but that day saved me. It took me out of the school arena and gave me back that little bit of self-confidence I needed to get through the rest of that year. By the end of grade four, I was really angry with my teacher and through sheer hard work and determination I had learnt all of my multiplication tables in spite of him. I still know them off by heart. It's like they are set in concrete. Years later, my mum and I were at a concert and through the crowd in the distance, we saw my grade four teacher. "Go and say hello," my mum urged, "he would love to see you after all these years". At the age of 16, I declined; I had an unbelievable urge to want to scream abuse at him and tell him how hopeless he was. I didn't of course. In fact, I have now forgiven him. He just didn't know how to reach or how to teach me.

At secondary school I was a conscientious student and although math was hard for me, I persevered. It took me a long time to understand a concept, but once I had it, I remembered it. I would even help my struggling classmates when they couldn't understand a concept. I went to a pretty rough secondary school and on one occasion coached a year seven friend from a pretty dysfunctional family who was failing maths miserably, even though he was smart. He did so well in his algebra test the teachers accused him of cheating and called in the year level coordinator to interrogate him. I heard along the student grapevine that this was occurring.

“Rodney’s been caught cheating,” they all repeated. I raced to his aid and went in to bat for him, explaining to the teachers that it was all his hard work. Thankfully he received a well deserved apology before any more damage was done.

In year nine at the age of 14, I had the most incredible teacher, Miss Grabowsky, and I got my first ever ‘A’ for math. She never gave up on me, or any other student for that matter, and for the first time ever I experienced what it felt like to be good at math. Why was it so easy to learn from her? When I think back, I recall she was a favourite teacher of mine. The girl who hated maths saw the magic in every equation. Miss Grabowsky was an exceptional teacher, smiled all the time and never got frustrated when she had to repeat instructions or do another example. She made you feel like a champion, always giving you positive reinforcement even when you struggled.

It all came tumbling down though when I got to year 11. At the age of 16, I admitted defeat. My teacher was well-liked and extremely competent, but he was also a factual teacher who stood out the front flying through equations on the white board; I could never keep up with his incredibly fast mathematical mind. At my mid-year report I got.....Wait for it..... F-1; ‘F’ for ‘big fat fail’ and ‘1’ for top effort. At least I tried, you might think, but I didn’t. I gave up and started doing other homework in his classes. He must have felt really sorry for me to give me a ‘1’ for effort.

Needless to say I swapped to art for the remainder of the year, did extremely well and have never attempted to star in the mathematical arena again.

As a teacher, my tragic maths history was a constant reminder to always be on the lookout for children who were not keeping up. I never wanted any child to feel the same way I did when I was in grade four or year 11. I made sure I modelled myself on Miss Grabowsky.

## What is dyscalculia?

Dyscalculia is defined as a severe ongoing difficulty with mathematics in an individual who has otherwise normal levels of intelligence.

Many children with dyslexia seem to have difficulty with math, but not always. According to the British Dyslexia Association 40-50 per cent of dyslexics show no signs of dyscalculia. They do as well in math as do other children, with about 10 per cent exhibiting high-level mathematical skills. That leaves approximately 50-60 per cent of dyslexics that do have ongoing difficulty with math.

There are also those non-dyslexics, like me, who are good at English, but still seem to struggle with math. These are people who just seem to struggle with dyscalculia in isolation. Best estimates say these people represent approximately 3-6 per cent of the population. Funnily enough, this describes my mum as well; I'm guessing there's a familial link here.

## Here are some of many varied symptoms of dyscalculia

- May have difficulty counting objects accurately
- May not be able to make a one-to-one correspondence when counting
- May look at a group of well-spaced objects on a page and have difficulty seeing with their eyes that 4 objects is 4 or 6 objects is 6
- They may find it difficult to progress from concrete materials like counters and blocks to numbers when solving maths problems, struggling with the interpretation of number symbols
- A difficulty with knowledge and confusion of the many mathematical symbols such as +, −, x, ÷, < , %, \$ etc.

- Difficulty with the working concepts of addition, subtraction, multiplication and division – they may need to use marks on the page or objects like counters to arrive at an answer
- When faced with an addition problem like  $6+4$ , may count from 1 to 10 to arrive at the answer or count on from 6 as in 7, 8, 9, 10 to find the answer
- May have difficulty learning or memorising multiplication tables
- To find answers to multiplication tables, they may use a variety of irregular number strategies rather than using automatic recall
- They may learn their multiplication tables one day and forget them the next
- May reverse or transpose numbers: for example, 73 for 37 or 6598 for 6958
- May struggle with mental maths - usually a set of verbal or written maths questions where problems are given orally or in a written format during a timed exercise
- May struggle to understand the concept of the passing of time and its measurement
- Might exhibit a poor sense of direction: left and right or north, south, east and west
- They may have a deep-seated fear of becoming lost due to a difficulty with spatial orientation, even when they have been on the same route before
- May have an inability to judge and estimate distance and other units of measurement
- Can struggle to remember and apply the correct mathematical number patterns, formulas, concepts and sequences
- May become confused or mix up the order of a sequential math problem
- Will often struggle with worded mathematical problems where not only are the problems written using words, they must be solved using correctly ordered mathematical processes to arrive at the correct answer
- May have an inability to comprehend mathematical conversions: for example, the relationship of multiplication to division, fractions to decimals, decimal

clock to analogue clock, show an addition fact on a number line, percentage price discounts to purchase cost, grams to kilograms or inches to feet, millimetres to centimetres and so on

- Find algebra very difficult
- Struggle with the concept of money and may be unable to estimate costs or calculate the change they should receive after a purchase
- Be able to use formulas, but adhere to the steps without understanding the purpose or meaning of the formula
- They may have trouble keeping score in a game they are playing
- Have difficulty with more complex mathematical procedures such as carrying numbers like 1's, 10's or 100's to complete an addition or subtraction problem or complete a multiplication or division problem
- May have difficulty neatly and accurately writing out lines and columns of numbers to complete Math problems
- Will often have difficulty with geometrical shapes and spatial relations exercises
- Can have difficulty with place value and writing large numerals
- May struggle to learn Roman numerals
- May become extremely anxious and panicky when placed under pressure or are faced with a mathematical challenge. This can then impact on their ability to think logically when solving problems, writing answers or completing tests or exams.

## How does being dyslexic affect maths?

Dyslexics generally have visual and auditory processing problems along with various executive dysfunction problems. It is not hard to imagine how this impacts on mathematical ability. The teacher who stands out the front continually writing mathematical problems on the whiteboard is often disadvantaging the visual and auditory dyslexic. When the child has to do some examples in their own exercise book, their difficulties are revealed.

Adding to this, gaps in prior learning, poor pencil control and spatial relations difficulties can continually get in the way as they try to write neatly, organise their thoughts, follow the step-by-step procedures, set out the problems correctly and then arrive at the correct answer. Poor memory can also play a part in their downfall as they struggle to remember steps, the correct symbols, number patterns and procedures.

Worded problems can be a nightmare for a child with dyslexia, even when they are good at math. First, they have to decode the words accurately to read them before any math skills are even applied. This creates an unfair disadvantage for dyslexic children when compared to non-dyslexics. An accommodation to overcome this can be the provision of a reader for these types of problems and extra time to complete assessments.

Dyslexia is a term that relates only to the English language, but its existence can also heavily impact on a child's mathematical performance in a myriad of ways, hence the term dyscalculia or 'difficulty with numbers'

### **Jill's story**

Jill was a mum I met once at my daughter's ballet school. She heard I was writing a book and came over to tell me that she felt that she was probably dyslexic, yet she had never been diagnosed. She went on to tell me that all of her three children struggled academically at school, yet she was not overly concerned as they excelled in other areas. I asked her what she did for work now, and she revealed that she ran a very successful sports management company, in spite of the fact she still could not read or write well and was terrible at math. "How did you get through school?" I asked. She leaned over and whispered in my ear. "I cheated my way through until year 10 and then I just left," she said. I must have looked shocked. She grinned broadly at me, full of bravado. "I had no option," she said. "I just couldn't keep up

and I wasn't going to be the dumb kid. It was purely about survival for me and I was good cheat too. No one ever guessed."

"How do you run such a successful company?" I asked amazed at her candour. "That's easy," she said. "Much easier than school. I am an excellent delegator. I employ great people, the ones that did well in school. I talk and someone else types on the computer. I bring in the business and my business manager takes care of the finances for me." When I think about Jill it still makes me smile. She amazed me with her resilience and her take on the world. Even though she can relate to her children's struggle at school, she believes wholeheartedly they will be highly successful just like her - just not in the academic arena. I've since met many people like Jill.

### **Brittany's story**

Six-year-old Brittany loved to count. She would sit in the back seat of her mum's car and count to 200. On most occasions she would get caught when numbers would jump from 39 to 40 or 59 to 60; she could never remember which group of 10s came next. Her mum would help her with this little glitch and off she would go again. Brittany also liked to add and subtract simple numbers like  $6+4$  or  $9-3$ , she would do these by using her fingers as counters, always starting from 1 for addition and the 9 for subtraction.

This was relatively normal for a little girl of six years who was developing her mathematical skill, but difficulties arose when she was asked to write or identify any written numeral over and above 10. She simply did not know in which order the numbers went; was it 12 or 21 and why? Brittany's mother Barbara was confused and she became frustrated with Brittany. "How can a child who loves to count so much not be able to identify the numbers on the page," she demanded?" Brittany started to become withdrawn in response to her mum's outbursts. She didn't understand it either. It did not take long for Brittany to stop trying to count and do simple math problems.

## Matthew's Story

Matthew was in grade four and his first semester report had just come home from school. His Mum Celia was reading it and noticed he had received an 'E' in the mathematical area of 'Number'. Celia knew that Matthew struggled with math, but she did not realise it was this bad and she became worried.

She emailed the teacher and asked for an explanation. Mr Brown emailed her back that Matthew had achieved 5 per cent for 'Number' on his end of semester assessment and most likely needed a tutor to assist in this area.

Now Celia had an interesting dilemma on her hands. She could not easily afford a tutor and she was not only a high achiever in the science and math field, she was also a recently qualified secondary school math teacher, although she had not yet taught math. I was talking to Celia and she asked my advice as to how to tackle this problem. To start with she did not know what 'Number' meant in the mathematical curriculum and she wasn't quite sure what she was meant to teach Matthew to help him catch up.

Stay tuned.... Later in this book I will tell you what I told Celia to do to solve this problem, as it is a problem that affects many children and their parents across many mathematical areas.

### Author Alert

Dyslexia and dyscalculia are extremely mystifying for both the parents and children who are struggling to learn. This fact alone brings to light a critical factor, which will affect the lives of children with dyscalculia everyday. It will always be extremely hard for skilled, automatic math whizzes (often our children's math teachers and some parents) to imagine what it must be like not to be able to identify and process numbers easily.

“Individuals who do not have dyscalculia can often assume that the real problem is a lack of intelligence, stubbornness, a lack of effort, laziness or a disinterest in learning altogether. Some even believe that a struggling child's parents are too proud and are unable to recognise or won't admit that their child may not be as smart as they think.”

This inability to recognise a struggling learner can also apply, unfortunately, to the parents and the teachers of children with dyscalculia.

Children begin school full of enthusiasm and determination to do well. Their number one priority is to make their parents proud. When they begin to show signs of a struggle to learn, we must remember that we are often seeing the symptoms of something far deeper. A child's difficulty to learn needs to be explored, reasons identified and difficulties recognised. Only then we can begin to help our children to achieve personal success.

As with all children who are demonstrating an ongoing struggle with a particular subject area at school, it is important to understand the extent of their difficulty. Depending on the age and communication skills of your child, this can be relatively easy to find out or you may have to do some research.

“You can get a copy of your child's year level curriculum from you child's teacher and it can be a valuable resource. Don't hesitate to ask for one to give you an understanding of year level expectations.”

It would be impossible for me to cover every aspect of a child's math school curriculum at the level applicable to every child. Because of this I have chosen those areas that seem to cause the most difficulty for children with dyslexia and dyscalculia.

If you decide to work with your child to assess their mathematical knowledge, make sure you do not apply any pressure and create further anxiety, as this can be detrimental to their self-confidence. You are looking to understand their verbal and written mathematical ability, so check for both.

Be aware that it can also be a feature of dyscalculia that a child will know an answer to a mathematical problem, but not how they worked it out or, sometimes, how to show the working out; be prepared for this possibility. This is known as 'top down learning' and can be a feature of individuals with high level, whole brain thinking skills, even though it can be mystifying to parents and teachers.

My husband Andrew is the master of this. I think in words, he thinks in numbers. He never ceases to amaze me how he can analyse financial risk, determine the viability of a business opportunity and successfully manage our finances. Incredibly all this information is available to him 24/7 as he can instantly recall this information at any time he requires it. If I ask him to write it down, however, he will pull a face as he feels this is far too labour intensive when it is already stored perfectly in his memory.

## **49 questions you can ask to help determine where to start when teaching your child math**

Here are some questions, which may help you to clarify in which areas you can assist your child. You can seek assistance from your child's teacher to answer these questions. If you do this, make sure you ask to see examples of your child's work. You don't want their opinions; you need to see the facts. Be prepared for the fact your teacher may not have the answers to all your questions immediately. You may need to forewarn them as to the information you are seeking and give them some time to prepare their response.

Make sure your child understands that your questions are not a test; devise a way to make it fun. One idea is to create an

afterschool treasure hunt and have a set of questions that you feel are appropriate to their math ability. You will need to read them each question and ensure you include a prompt as to where the next question is. Have about 10 instructions leading to questions prepared, record their responses as you go and ensure they receive a reward at the end. Remember to look for responses that are given both verbally and in written form.

The beauty of maths is that we use it all day every day as we go about our daily activities. You may like to use this fact as a way of ascertaining your child's mathematical understanding. Next time you are at the library see if they can add up the book catalogue numbers. Give them their pocket money and see if they can work out how many items they can afford at the local shop and then how much change they will receive.

Keep a record of how well your child performs, as this will help you to understand their strengths and weaknesses and how to best help them. It can also provide you with great insight when you encourage your child to tell you how they arrived at an answer. Don't try to guess as it is almost impossible to imagine how your child's mind may work, but this is important information to know.

Not all of the following questions will be appropriate for your child, so just choose those that are or devise some of your own based on their school curriculum. If you are trying to discover your child's ability in a certain area and your child says they can't provide an answer to a question you are asking, believe them, make a note of it and move on.

Never make an assumption about your child's mathematical knowledge or abilities. Your idea of what should be 'simple and easy' may vary greatly to what your child actually finds 'simple and easy'. Gaps in learning can be well hidden and devious. They will cause ongoing difficulty in the advancement of your child's mathematical abilities and you need to identify them in order to help your child succeed.

If as a parent you do not feel you are the appropriate person to obtain this mathematical information from your child, find someone who is. Remember, this process is about discovering any gaps in your child's learning and devising a method to provide them with some extra assistance. You can help them to catch up at school.

### Start with number facts

1. When my child is counting, aloud how high can they count? For older children, start at a higher number, maybe even in the 100s, 1000s or higher.
2. Can they count aloud backwards from 5, from 10 from 20, from 50 or 100? For older children this could be counting backwards from an even higher number.
3. Can they count aloud in even numbers 2,4,6,8,10,12..... and odd numbers 1,3,5,7,9,11...?

Children with dyscalculia can often feel anxious, pressurised and nervous when being asked to answer mathematical questions. It may take them longer than you would expect to be able to verbally respond or to write an answer. **Be patient**, encourage them to take their time and also ask them to be honest and tell you when they are not sure what an answer is so you can make a note and move on.

4. Come up with some more difficult counting patterns if you feel your child is capable and see how they go. You could start at any number and count aloud by 4s or start at 233 and ask them to count backwards by 10s or so on.
5. Next, assess their knowledge of number patterns in written form. Start patterns easy and get harder and harder. Look out for transposing of numbers: that is, writing them backwards. Don't comment at this stage; just see which numbers are included and how often it is occurring. You may notice here that your child's number ability may alter once you begin to ask for written responses. Some children do better when they can answer questions orally, some do better with written responses. This may reveal a strength or weakness to you, so be on the look out for it if this occurs.
6. If you put 3 counters on a flat surface can they tell you it is 3 just by looking? Try different numbers of counters, putting out more and more until they are unsure of the answers. You are looking for instant visual responses, not counting ability here.
7. Repeat the previous activity but allow them to point to the counters and count to arrive at the correct answer. Repeat this activity again and allow them to move the counters to a new location as they count.
8. Ask your child if they can write specific numerals – start in the single digits and then go to larger and larger numbers.
9. Write a number like 15. Show how it is made up of 1 ten and 5 ones (some teachers call ones 'units'). You might write  $15 = 1 \text{ ten and } 5 \text{ ones}$ . Ask them if they can tell you what the breakdown is for other numbers; start small and then get larger. This can be done verbally and in written form. Complete this activity with larger and larger numbers.

## Addition and subtraction

Approach addition and subtraction separately until you begin to look at the relationship between them. I have only included addition activities in the following list to avoid confusion, but you can apply these activities to subtraction problems as well.

10. Show your child the addition symbol '+'. Ask them if they know what this symbol means.
11. See if they can add simple single digit numbers in their head. Increase the size of the numbers and see how they go. Always start easy and make them feel confident before making tasks more challenging.
12. Try a similar activity using counters (pegs, buttons, pasta or small toys are good counters). See if they can do simple addition problems with counters. Let them move them around if they wish.
13. At some point it is important to see if your child understands the relationship between adding and subtracting. You can do this like this:  
for example  $2+3=5$  we could use these same numbers to write  $5-3=2$ . See if they can relate to this reasoning.
14. Write out some problems like this:

$$2+2 =$$

$$3+4 =$$

Increase them in difficulty by including problems that go over 10. Then if appropriate go harder again with double digit addition  $12 + 17 =$  , then  $14 + 18 =$  . At all times check to see how they are working the problems out.

Ask them to tell you what they are thinking as they calculate the answer. It is possible that they may not know; some individuals with dyscalculia are 'top down learners' as previously described. That is, they arrive at an answer but do not know how they got there. My husband does this - a very clever skill - but it will not help if prior learning steps are critical building blocks for future

learning or in a maths exam if a child gets marked on their ability to show the working out of a maths problem.

15. Number lines are invariably used in schools (some more than others) and can cause children with dyscalculia great difficulty. It may be a good idea to check your child's ability using a number line to do addition and subtraction problems.

16. Now it is time to transfer these horizontal maths problems to a vertical format. Correct setting out of the addition problems is important. The best way to do this is with lines on a piece of paper or grid paper. Make sure the 1s, 10s, 100s and 1000s columns all line up. You will find 1cm and 2cm graph paper in the free worksheets area on the website [www.helpingchildrenwithdyslexia.com](http://www.helpingchildrenwithdyslexia.com). All four processes can be more easily understood using a sequential range of extended notation examples. You can use these to explore your child's understanding and to help them to learn. Look at the following two examples to give you an idea.

**Addition 487 + 264 =**

$$\begin{array}{r} 487 = 400 + 80 + 7 \\ +264 = \underline{200 + 60 + 4} \\ \hline = 600 + 140 + 11 \\ = 600 + 100 + 40 + 10 + 1 \\ = 700 + 50 + 1 \\ = 751 \end{array}$$

**Subtraction 423 – 267 =**

Note do this left to right

$$\begin{array}{r} 423 = 400 + 20 + 3 \\ - 267 = \underline{200 + 60 + 7} \\ \hline \text{Answer } 200(\text{neg})40(\text{neg})4 \\ = 200 - 40 - 4 \\ = 200 \text{ subtract } 40 \text{ subtract } 4 \\ = 156 \end{array}$$

There are many variations on the above extended versions of working out math problems. This area is well worth exploring to make math more meaningful and logical and to encourage your child to broaden their mathematical knowledge and skills. I will continue to add more free worksheets to the free website [www.helpingchildrenwithdyslexia.com](http://www.helpingchildrenwithdyslexia.com) including some from math whizzes. Check regularly for updates.

17. At this point you need to go and see your child's teacher to ask where your child is up to with addition (and subtraction) at school. The reason for this is simple; every teacher has a different set of terms and a preferred way of describing and working out mathematical processes. It is important that your child understands the classroom teacher's method so as to avoid confusion. This will also assist them to be able to perform well in class assessments.

Melbourne primary school teacher Phil Bisset suggested these verbal prompts to gain some insight into your child's mathematical knowledge of the four processes.

- What is the question asking you?
- Can you make the problem using objects?
- Draw it
- Act it out
- Can you make a table?
- Have a guess and then check your answer.
- Create a worded problem to make sense of the question
- Work it backwards
- Explain it to me

Phil reinforced to me that math is logical and sequential. There are many ways to make math fun and enjoyable and in the process more meaningful. He said to think broadly and encourage children to use their imaginations to come up

with many ways to solve a problem and don't forget to utilise games to make it fun.

## Multiplication and division

Look at these processes **separately** unless you are examining the relationship between the two.

18. Show your child the multiplication symbol X and the division symbol  $\div$ . Ask them if they know what they means.

For X they may say, "that means groups of or times", which is fine.

For the division symbol  $\div$  they may say "that means how many" or "that means how many groups of."

19. See if they can multiply and/or divide simple single digit numbers in their head. Increase the size of the numbers and see how they go. Always start easy and make them feel confident before making tasks difficult. Use a variety of language to see if this helps them to successfully complete an equation.

20. Try a similar activity using counters (pegs, buttons, pasta, or small toys are good counters). See if they can do simple multiplication and division problems with counters. Let them move them around if they wish. It is also helpful to look at how addition relates to these processes using tactile objects to make it more meaningful. For example:

$2 \times 3 = 6$  - is the same as  $3 + 3 = 6$

$6 \div 3$  There are 2 groups of 3 in 6 therefore the answer is 2

21. At some point it is important to see if your child understands the relationship between multiplication and

division. You can do it like this. Use counters too if needed.

For example:  $4 \times 3 = 12$ . We can use these same numbers to write  $12 \div 4 = 3$ . See if they can relate to this reasoning. Remember to use their mathematical language.

22. Write out some problems like this:

$$2 \times 2 = 4 \text{ or } 4 \div 2 = 2$$

$$3 \times 4 = 12 \text{ or } 12 \div 4 = 3$$

Then if appropriate go harder again with double digit sums  $10 \times 17 = 170$  or  $81 \div 9 = 9$ , at all times checking to see how they are working the problems out. Ask them to tell you what they are thinking as they calculate the answers. It is possible that they may not know. If you remember, some individuals with dyscalculia are 'top down learners' - that is, they arrive at an answer, but do not know how they got there.

23. Now it is time to transfer these horizontal maths problems to a vertical format. Correct setting out of the math problems is important. The best way to do this is with lines on a piece of paper or use grid paper. Make sure the 1s, 10s, 100s and 1000s columns all line up.

Extended notation is also a useful tool here to use to understand your child's math abilities. For example,  $54 \times 46 = 2484$  can be shown as follows:

X	40	6
50	2000	300
4	160	24
$2160 + 324$		
$= 2484$		

Look for more examples of extended notation on the free math worksheets available on the website [www.helpingchildrenwithdyslexia.com](http://www.helpingchildrenwithdyslexia.com)

24. At this point you need to go and see your child's teacher to ask where your child is up to with multiplication and division at school. The reason for this is simple; every teacher has a different set of terms and a preferred way of describing and teaching mathematical processes. There is, of course, long and short division too. It is important that your child understands the classroom teacher's preferred method so as to avoid added confusion for your child. This will also assist them when completing classroom assessments.

Some teachers in the same schools do not use the same methods to teach the four processes. For example, your child's grade four teacher may teach long division while next year's grade five teacher may teach using only short division. This actually happened to me and I know this still occurs today. It can make math very confusing for your child. It pays to be aware of how teachers are teaching our children, the steps involved, how meaningful their methods are and how we can use this information to assist our children.

25. Multiplication tables can be very tricky to learn and almost impossible to remember for children with dyscalculia, but you need to get an idea of how much they do know in order to know how to help your child. Check their ability verbally and in written form. Look for their ability to automatically respond and also their strategies for working out answers to those tables they don't know automatically.

### **Time and clocks**

Some children can read a digital clock, but may have no idea how the numbers relate to the analogue clock or the passing of time. You are seeking to find out if they have perception of time, and if they understand

seconds, hours and minutes. Also consider their depth of understanding of the two different clocks, analogue and digital. I would avoid the 24-hour clock unless it is appropriate to school learning. It may, however, make learning more meaningful for them, if they are fan of the military. Clocks are particularly difficult for children to understand, not just for children with dyscalculia. A quarter past three can be read as; 3:15,  $\frac{1}{4}$  past 3, fifteen minutes past three, just after 3 and so on.

26. First, ask them which clock they prefer and why?
27. Get them to look at an analogue clock face and ask them questions. Remember to start easy and then get harder. For example: how many numbers are on the clock face? Which is the minute hand? Which is the hour hand? If it were one o'clock, where would the little hand on the clock be? Every time the hour hand goes right around the clock face and back to the 12, how much time has passed? A more difficult question for older children may be: if it was 5 minutes past 2 and 25 minutes passed, what is the time now?
28. An analogue clock is a very confusing circular number line. In fact, it is three number lines in one – one for seconds, one for minutes and one for hours. There is added confusion because it keeps repeating based on the number patterns of 12, 24 and 60, not base ten as in our regular decimal counting system.
29. Do a similar activity with the digital clock. This is much easier to read obviously, but you still need to ascertain if they understand the concept of time.
30. Ask your teacher for some blank sheets of clock faces and digital displays, or you can download them from the book website. Ask your child to draw in times that you give him or her.

31. See if your child has an understanding of am and pm. Give them a clock where they can manipulate the hands and ask them to show you the time and to tell you when it will be 1pm and 1am or 3.30pm and 3.30am
32. Ask your child some mental maths questions about time. Don't use a clock here; just see if they have a mental perception of time. For example: "Dad woke at 8.15 am He left for work at 8.45 am. How long is this in minutes/ hours?" You can make these as hard as is appropriate. Another example is: "If I went to bed at 8.30pm and I woke nine-and-a- half hours later – what time would it be?"

## Money

33. Lay examples of all your coin and paper money on a table and ask your child if they can identify them for you.
34. Make up some simple addition sums with them and see if they can tell you a sum total.
35. Give them a range of coins and ask them if they can show you more than one way to make up a set amount.
36. Run an activity using objects from the toy box or pantry. Start with simple calculations of how much these items would cost To.... If I used a \$20.00 note how much change would I get?
37. Show your child some price tags like \$12.99, \$5.50, \$3.30. See if they can read them to you. Can they tell you that the first number represents whole dollars and the number after the decimal point is part of a dollar or cents Money is often a child's first introduction to decimals.
38. When you are out shopping ask your child if they can tell you how much a group of items would cost or how much change they might get from \$10.00?

39. For older students you may like to include questions pertaining to shop discounts, bank interest, tax, superannuation, house mortgages, tipping a waiter, budgeting etc.

## Fractions

You need to be aware that fractions are a difficult concept for most children to understand. This is because fractions are often the first truly abstract mathematical concept that many children will encounter. Unlike other numbers, fractions consist of two parts: the top part, or numerator, and the bottom part, or denominator. Because of this dual nature, fractions cannot be treated as ordinary numbers.

When dealing with a fraction like  $\frac{2}{3}$ , you must deal with two numerical entities that cannot be separated. In addition to this, the character of the fraction is determined by both its numerator and its denominator, and not by each one separately, making ordinary mathematical operations confusing. For example, when you multiply fractions, you are not simply multiplying two numbers together, but two pairs of numbers together. When adding or subtracting fractions, you cannot simply add numerator to numerator and denominator to denominator; you must first be sure you are comparing 'apples to apples'. That means you must first arrive at a common denominator. Once you find these denominators, fractions become much easier. It is finding the common denominator that can sometimes require a little work.

40. Start with a real-life, concrete example like a pizza, a cake or a piece of fruit. Then move to a paper representation and diagrams. See if your child knows what a whole is, then a  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ ,  $\frac{1}{8}$ ,  $\frac{5}{8}$ ,  $\frac{7}{8}$
41. Try this activity again by asking them to divide a symmetrical geometric shape up into different fraction amounts. See if they understand the concept that fractions must be equal parts.

42. Now try a similar activity and see if they can indicate to you with a pencil what  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ ,  $\frac{1}{8}$ ,  $\frac{5}{8}$ ,  $\frac{7}{8}$  would look like if they were to shade fraction amounts on an illustration?
43. Next, see if they can tell you if certain whole numbers, fractions and fraction parts are equal or different?
44. See if they can change a fraction into a division problem and if they recognise the hidden division symbol. For example, can they see that  $\frac{1}{3}$  is the same as writing  $1 \div 3 = ?$  If they realise this they can see that fractions are all about dividing up quantities.
45. See if your child understands the concept that the number at the bottom of the fraction tells them the name of the fraction (denominator) and how many parts there are in the whole, and that the top part indicates how many parts of the whole you have in that particular fraction. For example,  $\frac{5}{8}$  - five eighths has eight parts in the whole number and the 5 tells us in this particular fraction there are 5 of them.
46. It is now time to go and seek some direction from your child's school teacher and see what is expected of your child's knowledge of fractions at this time. Are they adding, multiplying or using their knowledge of fractions by applying them to other areas of mathematical learning like percentages or decimals?

## Decimals

Decimals are another way of writing numbers less than one. The figure written before the decimal point represents whole numbers and the number after the decimal point represents numbers less than one.

For example the number 2.111 indicates:  
- two is the whole number before the decimal point

- One tenth then one hundredth and then one thousandth reading left to right after the decimal point.

We use decimals every day and this fact is the best way to make them meaningful for our children. Utilise concrete examples; use money and shopping, petrol prices, stopwatches, the timing of races in sporting events and even fractions.

Decimals tend to be taught in later school years and can prove as frustrating for those with dyscalculia to learn as fractions and percentages.

47. Show your child the following decimals  $\cdot 5$ ,  $1 \cdot 3$ ,  $2 \cdot 6$ ,  $27 \cdot 65$  and  $99 \cdot 955$ . Can they tell you what these numbers are? The most familiar form of decimals we have is money. Can your child read some prices out of a shopping catalogue?
48. Can they tell you what each digit within the decimal number represents? That is the place the digit holds in the number in tenths, hundredths or thousandths?
49. At this point it might be appropriate to go in and see your child's teacher to ascertain at what stage your child's understanding of decimals needs to be. Are they adding, subtracting, multiplying, dividing or converting them to other mathematical forms? Look at the methods the teacher is using and find ways to make them more meaningful.

### **Other Mathematical areas that a child with dyscalculia may find difficult are....**

- Spatial relations
- Measurement
- Probability
- Conversions
- Angles – geometry
- Algebra

- Percentage and interest
- Certain mathematical formulas

You can follow a similar process to determine how to help your child in these areas. A child who struggles with math can lack confidence so it is important to help them to fill learning gaps and approach math with renewed enthusiasm.

### **Why is mathematics so difficult for some children?**

When we start school we begin to learn basic number facts. This learning provides our 'foundation skills', which become the building blocks for all other mathematical learning. Children also need to develop 'basic mathematical skills' such as counting, adding, subtracting and so on, while increasing their knowledge of mathematical symbols, terms, definitions and formulas.

Visual perception, memory and logical, orderly thinking are critical to learning these math foundations skills, but unfortunately these are often the areas in which children with dyslexia and dyscalculia struggle. If a child's foundation skills are not firmly in place as the difficulty of maths tasks increases throughout their school years, huge gaps start to appear in mathematical learning, understanding and skill levels.

As is the case when teaching a child with dyslexia to read, spell and write, children with dyscalculia often need to have the gaps in their mathematical learning identified before you can begin to help them. Children with dyslexia and dyscalculia often need learning to be made more meaningful and for it to be provided in smaller steps, with more repetition and more practice. This is obviously where parents can become instrumental in helping their children to catch up when they are falling behind.

Because every child is different, it is important for you to determine your child's mathematical skill level. Use your knowledge based on your understanding of them and via

your discussions with your child's teacher to find out where you need to begin. If you prefer to arrange a tutor to help them to catch up, ensure they are well briefed in what you are seeking and give you regular feedback.

Formal academic methods of teaching, which utilise white boards, text books and oral instruction, rely heavily on visual and auditory processing skills. These are often not useful, enjoyable or successful for struggling dyslexic learners, so ensure you use your child's areas of strengths to reach them and to teach them.

Parents often fall into the trap of assuming the way they learnt maths at school is the best way or, sometimes, the only way to assist their children. My dad, a civil engineer, was a natural with numbers. I can still remember him trying to teach me secondary school algebra. He would say, "Just imagine that X is A and Y is B. After he introduced more factors into the formula, my brain would go into a downward spiral and shut down. I just got more confused.

Numbers and mathematical concepts are all interwoven. The world of numbers is logical, follows set patterns and, when viewed in its entirety, becomes easier to absorb, understand and interact with. The following list is a recommendation of methods you might like to explore to improve your child's mathematical skills.

## **10 ways to help your child with dyscalculia catch up at school**

1. Determine exactly what basic foundation number skills, general math skills and working knowledge of math symbols, terms, definitions and formulas your child is struggling with as described previously in this book.
2. Ask your child what areas of math they are good at or enjoy. Use these strengths as a building block to teach other math concepts.

3. Establish your child's main area of mathematic difficulty in their eyes. Ask your child this simple question; "If there was one thing you wish you could be better at school in maths, what would it be?" This may possibly identify their main area of concern - a good place to start to help them in order to improve their self-esteem, confidence and math skills.

When I was at school in grade five, one of my teachers would conduct the most exciting multiplication tables races between students, which were run on the principle of 'sudden death'. We would line up in two lines facing the teacher who would then give us a multiplication problem. If you weren't fast enough or didn't give the correct answer, we were out and had to return to our seat. The winners went to the back of the line to have another go until the last two children remained standing. How I wished I could be more competitive at this game. It was so exciting, with everybody cheering, but I got so nervous and my automatic response rates were just not fast enough. For all of grade five this would have been my main area of mathematical concern.

4. Use multi-sensory methods to teach math. Find out your child's favourite, multi-sensory learning method. They may like a combination of the following:

**Visual** - Do they like to watch information on a DVD or on a computer screen? Do they like to think of ideas or information in pictures or can they gain more information from pictures rather than numbers? Some visual learners prefer coloured text styles and pictures to help them break down learning into more manageable pieces.

**Auditory** - Do they like to listen to gain understanding? This may be something like a CD of songs about multiplication tables or a thorough practical verbal explanation of a mathematical concept. Some

children like to learn via rote and will absorb facts once they have heard or uttered them enough times.

**Kinaesthetic** - Do they like to have discussions with others when learning mathematical concepts, steps and skills? Does it help to cement learning if they can explain recently learnt mathematical processes to others by role-play or act? Can they memorise facts more successfully if they are involved in a physical activity while they are learning, such as drying the dishes or jumping on a trampoline?

**Tactile** - Does your child prefer to learn by doing, touching or feeling? This may include using learning aids like blocks, rulers or weights and making models?

5. Seek out some concrete learning and teaching aids that are suitable for your child. Ask your child's teacher if they can be borrowed from the school, look in toy libraries, toy shops, find an educational supplies business in your local area that specialises in math teaching aids or search for them on the Internet.
  6. Play games with your children. Children love quality one-on-one family time and card and board games provide just that, while developing math skills. Just think of all the skills your child is practising while playing Snakes And Ladders or Monopoly.
  7. Visit your local library and speak to the librarian about books that provide alternative math teaching methods to standard math textbooks. Many parents don't realise the fantastic resource that libraries provide. I have found some excellent books to help explain mathematical concepts in libraries.
- ✓ There are maths dictionaries that provide written and pictorial examples of every mathematical symbol and term in existence.

- ✓ Books of poetry that incorporate math riddles.
  - ✓ Books of math games you can try, using objects like playing cards and shopping catalogues.
  - ✓ Books that use illustrations and diagrams to explain mathematical concepts from a basic level to a more comprehensive level. These books take your child on a learning journey and are great ways to fill learning gaps.
  - ✓ Books which encourage the teaching of math skills via learning about everyday occupations, like zoo keeping or fire fighting.
  - ✓ Libraries also have audio CDs, computer software that you can borrow and, often, internet access to allow you to use the free math teaching aids.
  - ✓ Higher level books for secondary school teaching, which encourage learning visually, by using logical steps and instructions with colour coding to emphasise mathematical procedures.
8. Establish whether your child has a moment at school that made them believe they could never be any good at math. If there was a defining moment it is good to understand when it occurred and what it was. When I told you the story about my grade 4 teacher I did so for a reason. Our ongoing self-belief that we are incapable and incompetent is often the reason we fail to open our minds to the possibility that we can be good at maths or that we are already good at maths, but just don't realise it. The same is true for our struggling children. Talking, counselling, addressing and recognising these moments can help your child to come to terms with these defining moments and help them to look forward to a brighter, more confident future.

9. Find a Miss Grabowsky. If you remember, she was my year 9 maths teacher who helped me to achieve an 'A' on my end of year school report card. Teachers like this are worth their weight in gold simply because they are outstanding on every level. Do some research and find teachers like this in your child's school who can offer extra assistance to your child. Don't forget to consider recently retired teachers who fit into this category who perhaps live in your area. Pick up the phone and do some research.
  
10. There is no doubt about it; maths computer programs are a great tool for teaching many maths concepts. They tick all the boxes for many children, are fast, efficient, provide feedback, encourage learning of basic maths knowledge, skills and familiarity with maths symbols, terms and processes. The critical factor here is to find the program that best meets your child's ongoing needs. The most economical way to do this is to borrow, trial or sample a piece of software before you buy. Be thorough in your research. You don't want to waste your child's valuable time. Contact companies directly and ask them for a free trial, many have them as marketing or sales tools. Some companies will send a sales person to your home to offer a demonstration or will provide you with the address of a resource centre where you can trial a program. Your child is the one who needs to be impressed by the software, not you. Make sure they are able to give you their feedback. Don't spend money if they are not into it.

### **Now back to Matthew and his mum Celia**

If you remember, Celia's son Matthew had received an 'E' on his school report in the area of 'Number' and Celia, a scientist and a recently qualified secondary school teacher with a penchant for math was wondering how she should tackle this situation.

This is what I told her:

- Make an appointment to go and see his classroom teacher. Ask to see all the test results that gave Matthew the 'E'. While you are there, ask to look through his math schoolwork and workbooks too. You will soon understand what is meant by the term 'Number'.

This is what you need to come away with after this appointment:

- Written notes detailing examples of his difficulties including some examples.
- Ask the teacher to demonstrate how these concepts have been taught in the classroom.
- Then ask what learning would precede this math knowledge.
- Ask for a suggestion of a good learning aid to help Matthew to gain this knowledge? Ask if you can borrow any of these items to use at home.
- Ask for suggestions of games that you could play with Matthew to help him to learn these math skills.
- Finally, ask the teacher for a copy of the math curriculum for Matthew's year level that specifies in detail what he needs to know this year and in preparation for grade five next year.
- Many schools have access to online computer programs to teach math. Ask if Matthew can access any of these at home to help him to catch up.

## In conclusion

When your child started school it was never their intention to struggle and, on some days, even fail. Most children start school full of enthusiasm, filled with anticipation and excitement. Finally, they will have the opportunity to be considered a big kid and to learn in a formal environment. When learning becomes difficult, a child will often become baffled and frustrated, with many coming to the conclusion that they are just not that smart, or thinking something is wrong with them. How do they tell their parents that they just don't get it when all the other children appear to?

Research tells us that children with dyslexia and dyscalculia are of equal intelligence to all other children. It is parents who must ensure that their children have the opportunity to give of their best while at school. Teachers will vary greatly in their abilities, methods and skills to teach our children. A poor result on your child's school report one year can be turned into a top mark the following year when a good teacher is in charge. We have all seen that before and, perhaps, even experienced it. When your child starts to exhibit a struggle to learn, a vigilant parent can be the difference in determining the success of their child at school by offering support and advocating on their behalf.

In this book, I have given you many ideas to help your child with math. If you apply those strategies that will personally assist your child, you will be offering bridges of support, increasing their confidence and allowing them to shine.

### **Computer and Internet programs for teaching math**

You will notice I have left out any reference to math programs or computer programs that teach math skills. I did this intentionally to demonstrate to you that teaching your child math does not have to cost you money. There are, of course, many fantastic programs, many free, which can supplement your teaching methods. You can find a huge list of them in the free resources pages, which can be found on the website [www.HelpingChildrenWithDyslexia.com](http://www.HelpingChildrenWithDyslexia.com) I will continually add to this resources list as more programs become available.

**We wish you well. Your child's journey to a happier, more successful place has just begun.**

## About the Author



Liz Dunoon is a teacher and a mother to three children all with dyslexia. It was through her own research to help her children that she discovered a huge divide between what is known by researchers about dyslexia and what is happening to support children with dyslexia in our schools today.

Liz wrote this book as a response to the many parents who are seeking solutions to their child's struggle with math. She believes all children can learn math and the process is the same for all individuals whether they have dyslexia or not.

The difference is that children with dyslexia need to have their processing deficits and their learning strengths identified, as this will provide the key to effective teaching strategies, telling parents how their child can achieve learning success. Children with dyslexia invariably need smaller learning steps, more practice and more repetition to remember what they have learnt.

Children with dyslexia often struggle to keep up with their peers in the school classroom. This inability to keep up means gaps can appear in a child's understanding of the math process, making it harder for them to make progress. It is for this reason that parents are vital, because they can advocate on behalf of their children and offer this extra assistance. This book will show you how to teach your child do math from home.

### Liz Dunoon has also written:

#### ***Helping Children With Dyslexia***

21 Super Strategies To Ensure Your Child's Success At School.

#### **EBooks**

**Guide for Teaching** Your Dyslexic Child To **Read** From Home

**Guide for Teaching** Your Dyslexic Child To **Write and Spell** From Home

Available from the website [www.HelpingChildrenWithDyslexia.com](http://www.HelpingChildrenWithDyslexia.com)