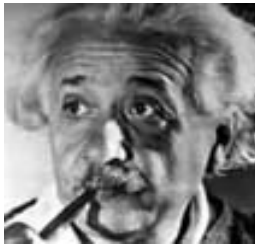


Dyslexia and Math

Many dyslexic children and teens often experience problems with math/s because of their difficulties with sequencing. Many have not yet learned the basics - how to count to 100 forwards and backwards, and do not understand any processes beyond addition. Jean Herold describes some techniques which will help.

Many dyslexic children and teens have problems in some areas of math/s, especially the multiplication tables, fractions, decimals, percentages, ratio and statistics.

A dyslexic student usually needs extra instruction, particularly as new concepts are introduced. With this subject, it is important to grasp each concept thoroughly before moving on. If not instructed properly in math/s, it will become yet another thing to weigh down their self-esteem.



Albert Einstein

Do not forget to remind them that they are in good company here: Albert Einstein's teachers frequently punished him for errors too! Fortunately, he did not let his early childhood experiences interfere with further study.

Sequencing and short-term memory

Problems in math/s can arise from a dyslexic child's difficulties with sequencing. Getting numbers in the correct order and being able to reverse that order is a challenge for the student.

A problem with short-term memory can make it particularly hard for the student to learn the **multiplication tables**.

To help a student with math/s the first thing that needs to be established is how much they know or understand about the subject. It cannot be assumed because of age or grade how much a student knows.

Small steps

Teach math concepts sequentially and in small steps. Do not move on to another concept until the student is ready and thoroughly understands the preceding concept.

For example, do not move on to counting backwards until basic counting has been mastered. The following exercises can be beneficial in reinforcing the relationship of numbers to actual quantities. They utilize the same **multi-sensory approach** used to teach dyslexic children to read. Introduce these methods as **games**, keeping them a fun activity. If the student becomes tired, seems distracted or bored at any point move on to another activity, or take a break for a while.

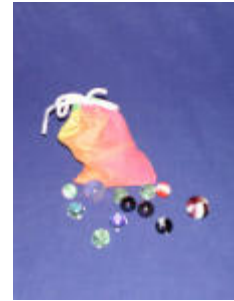
Counting to 100

Have a dyslexic child arrange 100 counters in a long line on the floor. Have her place a marker after each ten. The child can then practice counting all the way through to 100. Teach tens by using a different colored counter in place of the tens number so that they easily stand out.

After that, they can learn to count by fives. The counting of numbers by ten and five will help the child immensely when it comes to multiplication and time telling skills.

Have the child count forwards until they can do so fluently, then they can start to count backwards. Practicing counting can be done in any situation, counting cars as they pass by, or stairs as they climb up them.

Another exercise that can be done anywhere - in the classroom by the teacher, or at home with a parent - is to call out a number and have the child **call out the following one**. At first the hardest numbers for the child to remember are usually where there is a change of tens, as in 29 to 30.



Multiplication and division

Multiplication and division are the most difficult for the child to master. It will make it easier for the child to learn if they actually understand the concept. The following may help: collect 5 pairs of items, gloves, shoes, toy animals, anything as long as the pairs are the same. Lay out the pairs in front of the child, show her that there are two items in each pair, one pair has two items, two pairs has four items, etc. When the child sees the five pairs have ten items, explain as you write it down, that is what 5×10 means.

This exercise can be repeated with each of the different pairs until she understands what the "2 times" means. Once the child is familiar with the 2 times table, they should begin to work on all the tables in the following order: $2x$, $10x$, $11x$, $5x$, $3x$, $4x$, $9x$, $6x$, $7x$, $8x$, then finally $12x$, which they should know from the other tables.

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

When first using worksheets, use pictures of familiar animals or items for students to count. If a student has difficulty with one particular fact show them how to use the facts they do remember to help them.

An example of this is if a student knows 6×5 well, show them how to use that to figure out 7×5 by counting up by five.

Relate mathematical story problems to things they like and their friends or family, this way they have the added dimension of visualization to work with.

Games work particularly well

Games work particularly well with dyslexic children as they seem to have an aversion to plain work sheets. Children enjoy playing **Bingo**. This multiplication Bingo game is a big hit with most kids. Make a Bingo type card on a piece of paper, fill the squares with the answers to all the multiplication facts, up to 6 x 6 with regular dice, 9 x 9 and 12 x 12 (or with the polyhedral dice available at school supply stores). Take it in turns to roll the dice; multiply the two numbers rolled and mark it off on the players' Bingo sheets.

Without making it too obvious, let the child win any games to build up their self-confidence.

Teach the child to **talk through** math/s problems, saying it softly to themselves, without disturbing others. This will employ auditory as well as visual memory abilities. Explain to them how this will help because the brain can store different kinds of memories. Often a child will read a whole problem, remember some numbers and do any kind of math calculation that comes to mind! Show the student how to jot down the key facts and symbols in a problem as they come up.

Use a calculator

Show a dyslexic child how to use a calculator. Students should not use the instrument to do all of their math work, but to check their calculations and make corrections where necessary.



Make individual worksheets for students. Structure worksheets to meet the students knowledge and ability; simplify word problems so they will not be an obstacle for dyslexics; customized sheets will allow for success, not failure.



Real coins

When teaching about money use real coins instead of plastic, this is far more fun and exciting for the children. It is not always necessary to spend a fortune on items for tactile use; change from your pocket, pieces of cereal, simple circles cut out of colored paper are great for whole number and fraction work.

Singing the Multiplication Tables

I work with a small group of dyslexic children teaching numeracy. As I am a great believer in multi-sensory teaching, I thought about how I could make the multiplication tables more fun for these kids as they readily “shut down” at the mention of times tables. I scouted around and got myself a tape of “**Sing the times tables**” from a local resource shop. When the students came to class next I gave them a copy of the words to the “Times Tables” songs and we spent the lesson learning the words and singing along to the tape. The kids thoroughly enjoyed this, as it was a break away from pencil and paper for a change.





Now every time they come to class I have the tape playing in the background and I have developed some worksheets to go along with the tape – as they sing along they fill in the missing blanks, i.e. the words of the song: “2 little caterpillars crawling on the floor, they were joined by 2 more then there were four”. So the sheet says $2 \times 2 = ?$ Caterpillars, and so on. Pictures of cheeky caterpillars on the worksheet also add to the enjoyment. The students are responding well to this exercise and although it is early days with them (they are a young group!), I feel that verbalizing (singing) the times tables is going to have a huge impact on their learning when it come to solving harder problems. (P.P., North Queensland, Australia)

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