

Dyslexia and Maths Difficulties

Maths difficulties are common in students with Dyslexia. The areas of maths that students with dyslexia find the most difficult are:

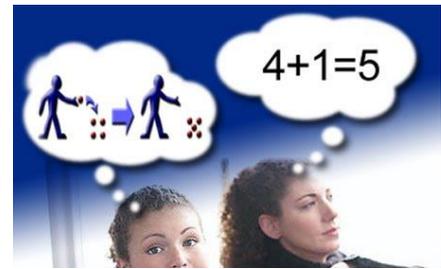
- **The language of maths:** Some students struggle to read and understand the vocabulary in maths questions, and therefore do not know what task they are being asked to do. Many different words can be used to describe the same action, e.g. add, increase, plus, total.
- **Sequencing:** The learning of maths is very sequential, but to successfully complete many maths problems a very strict sequence must be followed. Learning multiplication tables is all about learning a strict sequence of information.
- **Orientation:** Difficulties with orientation and direction can lead to confusion of maths symbols. Some people with dyslexia show weakness in the Coding subtest in the assessment, meaning that they struggle to decode symbols accurately and quickly.
- **Memory:** There are many facts, figures, tables, and formulas which have to be learnt and recalled accurately.
- **Confidence:** A lack of confidence in their own maths ability can worsen the above difficulties.

What Works for Maths Difficulties?

There is a lot of research that indicates that the school environment and teaching methods are important influences on the mathematical performance of children.

- Individual or small group work within a class
 - Individualised work within a class usually involves progressing through a textbook at the pupil's own pace; the use of individualized worksheets, and/or the use of educational computer software.
 - Small group approaches may take a similar form or may involve group projects where several pupils work together on the solutions to a problem.
- Peer teaching
 - This can involve older children teaching younger children, or collaborative learning between peers of similar or different ability.
- Collaborative group work
 - This involves several children co-operating in solving a maths problem.
 - This can serve several purposes: increasing motivation, encouraging children to put their mathematical ideas into words, reflect on strategies that they use, and enable them to transmit knowledge and ideas to one another.

- The *multi-sensory teaching* approach involves the use of a combination of visual, auditory, and kinaesthetic input to aid learning. For example, using concrete manipulatives to teach mathematical concepts, using colour or pictures, video, songs etc.



Other Strategies

- Maths teaching should be structured and cumulative and the use of multi-sensory methods employed.
- Simple examples should be used for new concepts and concepts should always be introduced at the concrete level with materials before going to maths problems in number, symbol and word form.
- The language used should be transparent and students should be encouraged to put mathematical terms into their own words.
- Appropriate aids such as number lines, number squares, and calculators should be available, and students should be taught how to use them.
- Computer programmes can be useful to help consolidate learning.
- Metacognitive strategies will be particularly useful for problem-solving.
- The book '**Teaching Numeracy to Children with Dyslexia**' by **Pauline Clayton** may be useful for further strategies.
- The key to solving maths word problems is to have a plan or strategy, which works in any math word problem-solving situation. When a student is presented with a question that requires mathematical calculation, they may benefit from following the 12 tips provided:
 1. Read the problem carefully looking for clues and important information. Write down the clues, underline, or highlight the clues.
 2. If necessary, rewrite the problem to help find these clues.
 3. Look for clues to determine which math operation is needed to solve the problem, for example, addition, subtraction, etc. Look for keywords like sum, difference, product, perimeter, area, etc. They lead to the operation needed to solve the problem.
 4. Look for what is needed to solve the problem, for example: how many will be left, the total will be, everyone gets red, everyone gets one of each, etc.
 5. Use variable symbols, such as "X" for missing information.
 6. Eliminate all non-essential information by drawing a line through distracting information.
 7. Draw sketches, drawings, and models to see the problem.
 8. Is the word problem similar to previous work, if so how was it solved?
 9. Develop a plan based on the information determined to be important for solving the problem.
 10. The use of rehearsal cards, counting activities, number squares and calculators, and computer programmes.
 11. Does the answer seem reasonable, if it does then it is probably ok – if not then check the work.
 12. Work the problem in reverse or backwards, starting with the answer to see if you wind up with your original problem.

Useful Resources

- 30 Maths Games (Prim-Ed) – fun maths games to help motivate younger primary children.
- Flip Over Fun Times tables (Michael O'Mara Books) – helps children to develop and remember their timetables.
- Making Sense of Measurement-Puzzle Game (Smart Kids) – developing vocabulary related to measurement in maths.
- Numicon; Multi-Sensory Approach for teaching Maths skills (www.numicon.com)
- Support for Basic Maths (Learning Materials Ltd.)
- Telling the time (Easylearn)
- Teaching Numeracy to Children with Dyslexia' book by Pauline Clayton

Useful Websites

- <https://ie.ixl.com/math/> - provides Irish curriculum-based support from Junior Infants up to 6th year for Maths and English subjects.
- Free multisensory maths tutorials can be accessed at www.alison.com.
- www.helpmykidlearn.ie – provides ideas for parents of children aged 0 – 12 to learn on a number of topics, from numeracy, literacy, and communication skills.
- <http://www.primarygames.com/math.php> and <http://www.mathplayground.com/> - maths games for children.