Dyscalculia: Strategies

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5 Strategies for Managing Dyscalculia

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Many students struggle with math and math anxiety, but for those with dyscalculia, a math-related learning disability, math classes and tests present seemingly insurmountable obstacles that can affect academic success and lower self-esteem.

People with dyscalculia have a deficit in the brain’s ability to process number-related information. They may have trouble with math operations, memorizing multiplication tables and understanding math concepts. In a broader sense, they have difficulties with sequencing information, budgeting time and keeping schedules.

Grounding abstract mathematical information in the physical world can help dyscalculic students succeed. Here are five strategies for making math concepts from basic arithmetic to advanced algebra easier to understand and remember.

1. Talk or Write Out a Problem

For the dyscalculic student, math concepts are simply abstracts, and numbers mere marks on a page. Talking through a problem or writing it down in sentence form can help with seeing relationships between the elements. Even restating word problems in a new way can help with organizing information and seeing solutions.

2. Draw the Problem

Drawing the problem can also help visual learners to see relationships and understand concepts. Students can “draw through” the problem with images that reflect their understanding of the problem and show ways to solve it.

3. Break Tasks Down into Subsets

Dyscalculic students can easily get overwhelmed by a complex problem or concept, especially if it builds on prior knowledge — which they may not have retained. Separating a problem into its component parts and working through them one at a time can help students focus, see connections and avoid overload.

4. Use “Real-Life” Cues and Physical Objects

Relating math to the practicalities of daily life can help dyscalculic students make sense of concepts and see the relationships between numbers. Props like measuring cups, rulers and countable objects that students can manipulate can make math concepts less abstract.

5. Review Often

Because dyscalculic students struggle to retain math-related information, it becomes hard to master new skills that build on previous lessons. Short, frequent review sessions — every day, if necessary — help keep information fresh and applicable to the next new task. Creating written or drawn references such as cards or diagrams can help with quick reviews.

Like other learning disabilities, dyscalculia affects student success both in and out of the classroom. Study strategies that bring the abstract world of mathematics down to earth with visual and verbal cues and physical props can help dyscalculic students overcome obstacles to making sense of math.

If your child struggles with math or has been diagnosed with dyscalculia, contact us online or find a center near you to learn more about how the Brain Balance Program can help.

<https://www.sess.ie/categories/specific-learning-disabilities/dyscalculia/tips-learning-and-teaching>

**Strategies for Learning and Teaching**

* Use concrete materials and start from practical activities.
* Avoid creating anxiety for the student.
* Establish the student’s preferred learning style.
* Teach more than one way to solve mathematical operations.
* Build on student’s existing knowledge.
* Try to understand the student’s errors, do not just settle for wrong.
* Concentrate on one concept at a time.
* Language should be kept to a minimum and specific cues given for various mathematical operations in word problems.
* Encourage students to visualise mathematical problems. Allow students to draw a picture to help them understand the problem and ensure they take time to look at any visual information such as charts and graphs.
* If the student does not have co-existing reading difficulties, encourage him/her to read problems aloud.
* In the early stages of teaching new mathematical skills ensure that the mathematical problems are free of large numbers and unnecessary calculations.
* Provide examples and try to relate problems to real-life situations.
* Provide students with graph paper/squared paper and encourage them to use this to keep the numbers in line.
* Ask to explain verbally how he/she arrived at particular solutions.
* Explain new concepts in a logical manner.
* Encourage students to teach a concept back in order to check understanding.
* Ensure worksheets are uncluttered and clearly laid out and provide ample room for uncluttered computation. Ensure that the page does not look intimidating.
* Limit copying from the board.
* Allow students to use computers and calculators, especially to self-correct.
* Provide students with extra time to complete tasks and encourage the use of rough work for calculations.
* Directly teach the language of Mathematics.
* Always bear in mind the language of Mathematics differs significantly from spoken English.
* Use consistent mathematical language both in your classroom and throughout the school.
* Make use of mnemonics and visual prompting cards to assist students in memorising rules, formulae and tables. Repetition is also very important.
* Always match the strategy to the student’s identified needs and abilities.

http://www.stevechinn.co.uk/dyscalculia/dyscalculia-in-further-education

**Dyscalculia in Further education**

**Introduction**

There are students who will be re-taking maths to achieve the maths exam result and qualification that enables them to apply for jobs. There will be students who find that their chosen course has aspects of maths as a vital and important component of the topic they are studying. Obvious examples will be courses in engineering or construction. Less obvious examples will be psychology and hairdressing.

Some students will have a long history of low achievement in maths, so regaining motivation will be a big issue. These students will not be motivated by 'more of the same'. The time span for studying is relatively short and expectations may be high, as in, trying to achieve a 'pass' grade in maths in one year, having spent the last 10 years of schooling not understanding the topic at a level that generates exam success.

Thirty years ago it was hard to find books and materials for English that were at the correct level of intellectual challenge, yet age-appropriate in appearance. That has been addressed, but the same has not yet happened for maths. This is exacerbated by the culture in maths teaching that views manipulatives, such as base-ten blocks, as unnecessary for older students (and that often applies in secondary schools, too).

Alternative qualifications to GCSE may have maths set in a more functional and practical way, but they are often much more wordy, so that the challenge is as much about reading and interpreting the paper as it is about the maths content.

Worksheets need to be both age and level appropriate and set up to generate success. Motivation is more likely to come at any age, but especially this age and after a history of failure, if meaningful success can be experienced. Worksheets should also have enough content to provide experience, but not over-face the student and create avoidance.

Note: It may be helpful to read the previous sections, irrespective of your age.

**At home**

Key issues, as the perception of students as independent learners increases, are likely to be personal organisation, especially time and timetables. Some useful apps are listed under Resources in the HE section. Negotiating extra time for assignments may help, but it is important to remember that time is finite and that life needs balance.

**The individual (socially/ emotionally/ behaviourally)**

(Much of the advice for secondary age students applies here). Maths in the context of the subject being studied, for example, carpentry or hairdressing, is now real and has consequences if it is wrong. Not in appraisal via a score or a tick or cross, but in the success of doing the task. Being able to estimate before and after the task helps set up the task and then appraise it. This needs to be in addition to any precise calculations. For example, a painter may need to estimate how much paint to buy for a specific job or how much time the job may take in order to provide an estimate of the cost. A hairdresser will need to calculate the correct dilution for a hair colouring. Not surprisingly, the standards required, and tested, for calculations in nursing are very high. This can raise the levels of debilitating anxiety. The use of estimations in combination with precise calculations can provide some level of reassurance. In education (on learning / attainment / behaviour)

When a student has to gain a maths qualification in order to access and pursue a career and that student has a track record of failing to achieve this, then it will not be surprising if there are emotional consequences. Individuals will show different behaviours, but creating motivation will have to deal with that range of behaviours. As with so many issues in maths, there will not be one approach, one solution. I am always wary of the person who advocates a teaching strategy because 'It worked for me'. As with the comments in the Secondary age section, attributional style may provide some helpful strategies. In some respects, I find that source broader than Mindset and thus more useful across a range of situations. There is a (free) maths anxiety questionnaire on this website. The questionnaire in my book 'More Trouble with Maths' is only standardised to age 16 years, but may still offer useful and pertinent information. Often, initiating relaxed conversations about affective issues is far more revealing than simply an 'anxiety score'.

**Strategies**

The key goal for those re-taking GCSE or Functional Skills will be to restore motivation. It is likely that that will mean a different approach combined with providing experiences of success. This may well include discussing what the student's goals are and why he thinks these have not been reached and what he remembers as something that did help. It is a constant theme in this section on dyscalculia that visual images, linked appropriately to the pertinent vocabulary and the symbols has a strong chance of success. However, there are rarely 'quick fixes' so it may be a case of finding the relevant strengths, the topics that are best understood by the student and focusing on those rather than attempting to master the whole syllabus. It is likely that input for maths test anxiety will help. Students may need to learn exam techniques and strategies. They may need to jot down key information before starting to answer questions. This can help direct the mind to the maths and may give a secure source of information that stress might block as the test/exam progresses.

As with any age of learner, asking them to explain how they are trying to solve the problem (meta-cognition) encourages understanding and success. Asking if the student can see another way of solving the problem may help, but make sure this doesn't create stress. It is important to always keep in mind that no one approach works for all. The goal is to make this routinely automatic for students to do for themselves. It is important to refresh the memory for strategies that access basic facts, so that the access becomes as close as possible to automatic. For example, 15% can be calculated by working out 10% (divide by 10), halving that 10% to get 5% and adding the two percentages. This is an example of an approach that uses two (or more) easy steps to replace one impossible step.

There is often a need to go back to the basics to ensure that they are secure. Maths is a very developmental subject and the foundations must be sound and automatically accessible.

**Useful sites/ resources**

* dyscalculia-screener.co.uk/ , which claims to be, 'the World's only post 16 screener'.
* Mathematics Pro - a GCSE revision app.
* Moorcraft, P. (2015) 'It Just Doesn't Add Up: Explaining Dyscalculia and Overcoming Number Problems for Children and Adults' Original Paperback
* [www.mathsexplained.co.uk](http://www.mathsexplained.co.uk/) (tutorials that address topics in a non-age specific way)
* stemreader.org.uk is a Windows application with tools to help read and explore equations. With STEMReader you can hear equations read aloud and see the transcript on screen, break down equations into simple chunks to make them easier to understand and check the meaning of unfamiliar symbols