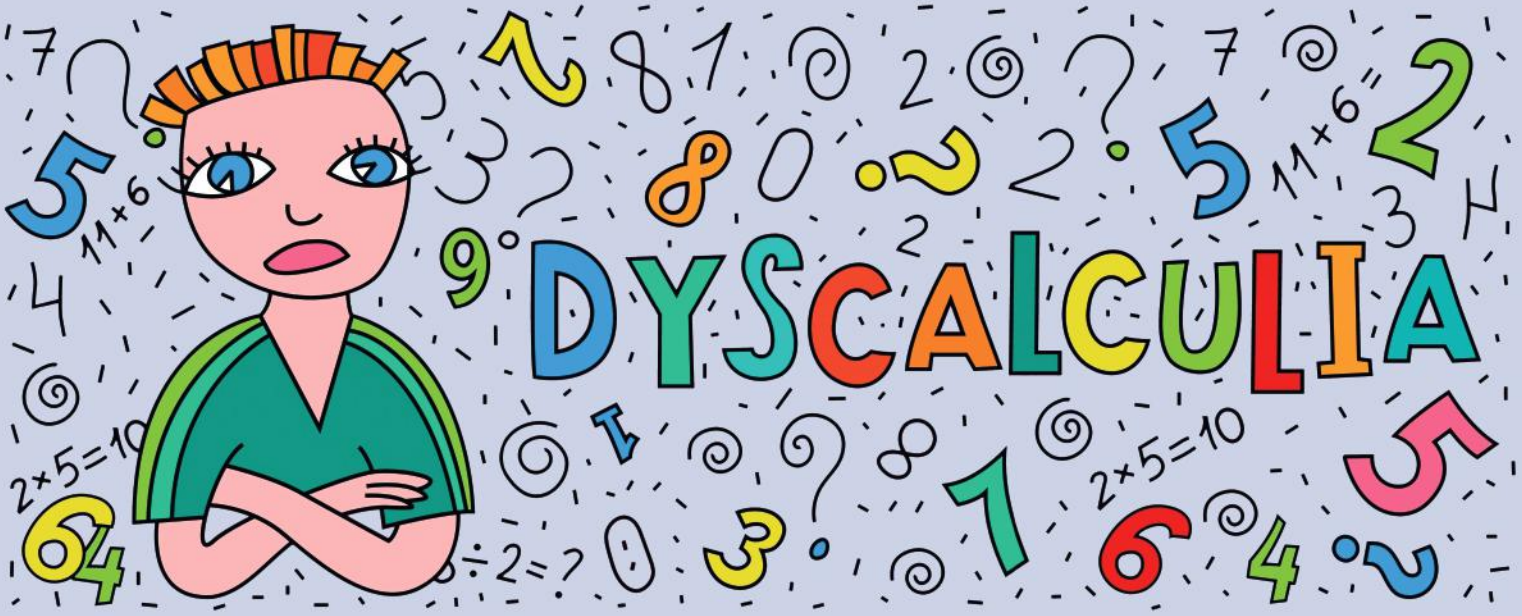
Dyscalculia

A miniature guide



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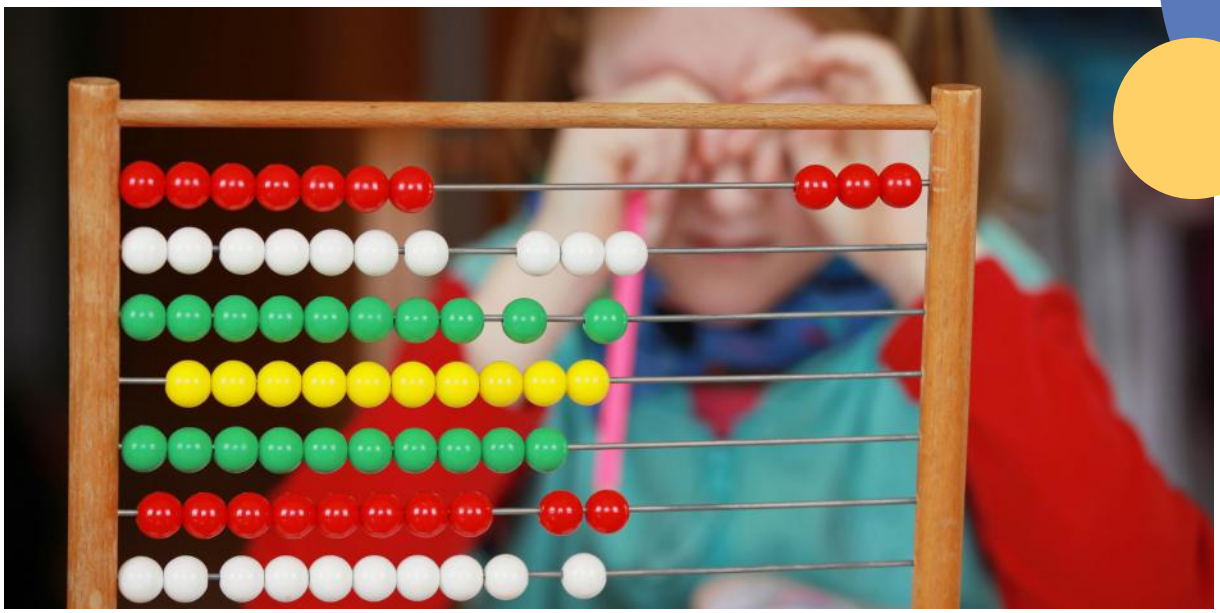
What is dyscalculia?

- A Specific Learning Difficulty (SpLD) affecting the ability to learn mathematical skills.
- It can occur across all ages and abilities.
- It can be a single difficulty but is often comorbid with other conditions.
- Around 6% of the population are thought to suffer from dyscalculia.
- The study of dyscalculia is several years behind that of dyslexia.

It is estimated that 25% of people have maths learning difficulties for a variety of reasons. It could be part of a neurodiverse condition, a trauma, or missed learning experiences at school, so it is not surprising that dyscalculia can be difficult to diagnose.

How is dyscalculia different from other difficulties with maths?

- The difficulties could be classed as 'severe'.
- They will have been noticeable since the child was young.
- The difficulties apply to arithmetic, but not necessarily other areas of maths, such as geometry.
- Difficulties may be limited to maths and not seen in other subjects.



Here are some of the traits people with dyscalculia may share:

- Difficulty with subitising even a very small quantity (i.e. cannot automatically say how many items are in a small set without counting them one by one).
- Lack of understanding of how numbers can be manipulated, for example that 8 can be made by 6 + 2, 7 + 1, double 4 etc.
- Difficulty in understanding what is reasonable in relation to numbers, for example, that a football should not cost £1000.
- Great difficulty in seeing patterns.
- Difficulty in counting backwards.
- Difficulty sequencing.
- Rely completely on rote procedures (even if not understood) and simple methods, such as using fingers to count.
- Easily forget procedures that seemed to have been previously mastered.
- Unable to explain what they are doing.
- Difficulties with automatic retrieval of information, such as times tables.
- Difficulties with learning to tell the time and understanding of time.
- Weakness in both short and long-term memory.
- Poor understanding of the link between symbols and quantities.

8 or 6 ?

Someone with dyscalculia may have high levels of maths anxiety, but anxiety does not necessarily indicate dyscalculia. (See 'Maths Anxiety' below.)

Early identification is important so the correct interventions can be put into place. Strong foundations are vital in mathematics learning; lack of understanding of the early concepts can severely hamper further learning.

Is dyscalculia more common in males?

As previously mentioned, the study of dyscalculia is behind that of other learning difficulties. There are currently no case studies linking dyscalculia to gender.

It does seem to be passed on through genetics, which means it may be more likely for family members to have dyscalculia, although this does not necessarily follow.

Co-morbidities

- **Dyslexia** Around a 40% co-morbidity rate
- **Cognitive dysfunction** (in terms of working memory and visuospatial skills)
- **ADHD**
- **ASD**

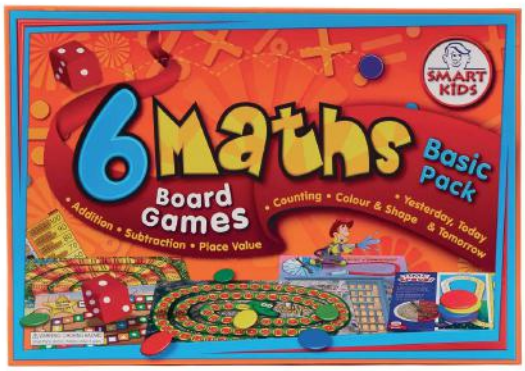
What support strategies can be used?

Allow extra time to complete a task.	**Encourage learners to use calculators.**
Use visual and concrete materials to develop understanding of maths concepts.	**Use ICT as an aid to learning.**
Use multi-sensory strategies to aid learning.	**Encourage working with a partner.**
Incorporate practical activities into lessons.	**Allow extra time to 'over-learn' maths concepts and rules.**
Break new teaching moments into the smallest component parts.	**Break down mathematical language. Write maths dictionaries together, either for the whole class or individuals.**
Include activities to improve working memory. (Find suggestions here.)	**Use the CPVVA approach: C**oncrete – **P**ictorial – **V**isual – **V**erbalise - **A**bstract

What resources are most useful?

Engaging maths games

Remove anxiety and add fun by playing games to practice baseline skills. There are many excellent games available for all maths concepts.



Physical games/activities

Kinaesthetic activities will allow some children to better understand and retain mathematical concepts

Tiles such as these can be used for all kinds of active learning. Can children make the numerals themselves from different natural objects found outdoors? Could they even use the same number of objects to create the numeral? (For example, use seven leaves to create the number 7)

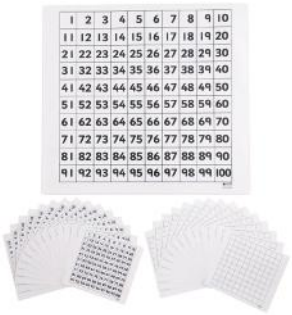
See more number card ideas here.

Calculators

Choose simple calculators that are clear and easy to use.

Have concrete resources available for use at any stage

Let children choose whatever resources they feel most comfortable using and create a culture in your classroom where this is completely acceptable.

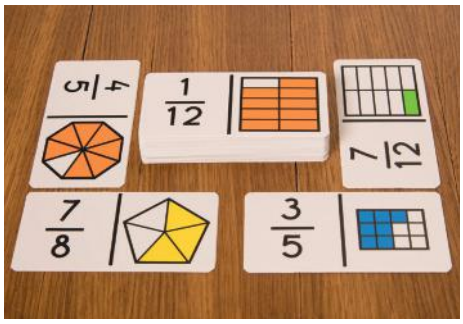


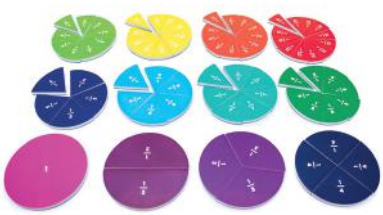
Keep it real and relevant

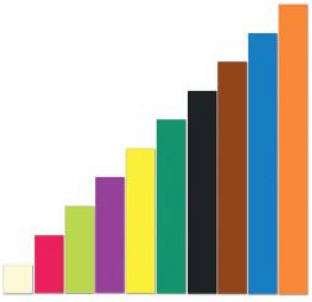
Provide inspiring ideas to encourage mathematical thinking and meaningful language development.

Visual models

Provide visual prompts wherever possible.







Stile

Stile has been around for many years but can still be a useful and motivating tool. It is self-checking and therefore can be used independently and with less stress for children with dyscalculia. Pupils answer questions and put the appropriate tile in the base of the tray. When all the tiles have been placed, they turn it over to reveal a geometric pattern. If all the answers are correct, the pattern will match the one printed on the top of the page.

Other Considerations

Maths Anxiety

Maths anxiety is not the same as dyscalculia.

Maths anxiety is a recognised disorder, with up to 1 in 5 people affected. It is characterised by a debilitating emotional reaction to maths in which people are affected in a variety of ways, from mild panic and mental disorganisation to headaches and nausea. It can lead to decreased confidence, lack of enjoyment and avoidance of the subject.

Studies have shown that around a third of younger people feel anxious about maths.

It is not affected by whether someone is considered good at maths.

Girls tend to be affected more than boys.

Some of the signs to look out for are children getting upset and seeming overly worried when in a maths lesson. They might use avoidance tactics, copy from others, or make wild guesses to avoid having to think about a problem.

What can we do to help?

✓ Be aware of maths anxiety as a real difficulty.

✓ Take more care in how we talk about maths – it is not a very difficult subject only for very brainy people!

✓ Get parents on board to encourage a positive culture for their children. Discourage comments such as "I was never any good at maths" and explain why positivity is so important.

✓ Try to make maths as fun and relevant as possible with real-life applications.

✓ Avoid putting children on the spot for quick answers.

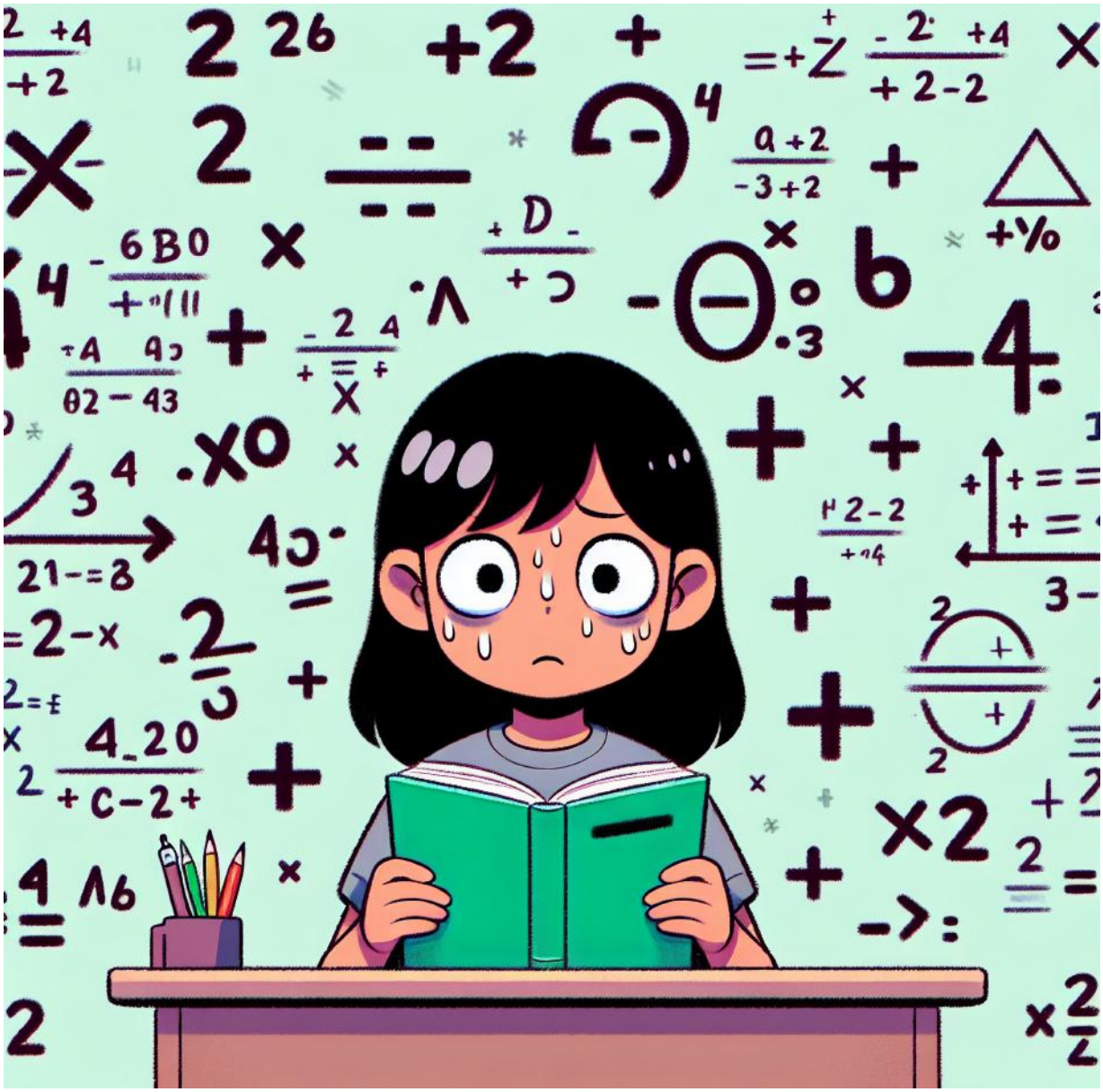
✓ Teach simple relaxation or breathing exercises.

Helpful contacts and further information

The Dyscalculia Network
www.dyscalculianetwork.com

The Maths Anxiety Trust
www.mathsanxietytrust.com

Dynamo Maths Dyscalculia Intervention
www.dynamomaths.co.uk/dynamo-maths/dynamo-intervention



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