Denny High School Est. 1959

Also available online: Defying Dyscalculia – Integrated Pupil Support at Denny High School

INTEGRATED PUPIL SUPPORT DEPARTMENT

DEFYING DYSCALCULIA

Info Booklet

Go to

Dyscalculia Network website for the most up-to-date information

Dyscalculia Network | Leading Support Network for Dyscalculia

Dyscalculia Network Unlocking Numbers

Go to

Call Scotland website for the most up-to-date information

Posters and Leaflets

Dyslexia Scotland

#prideinDennyHigh

CALL Scotland

What is Dyscalculia?

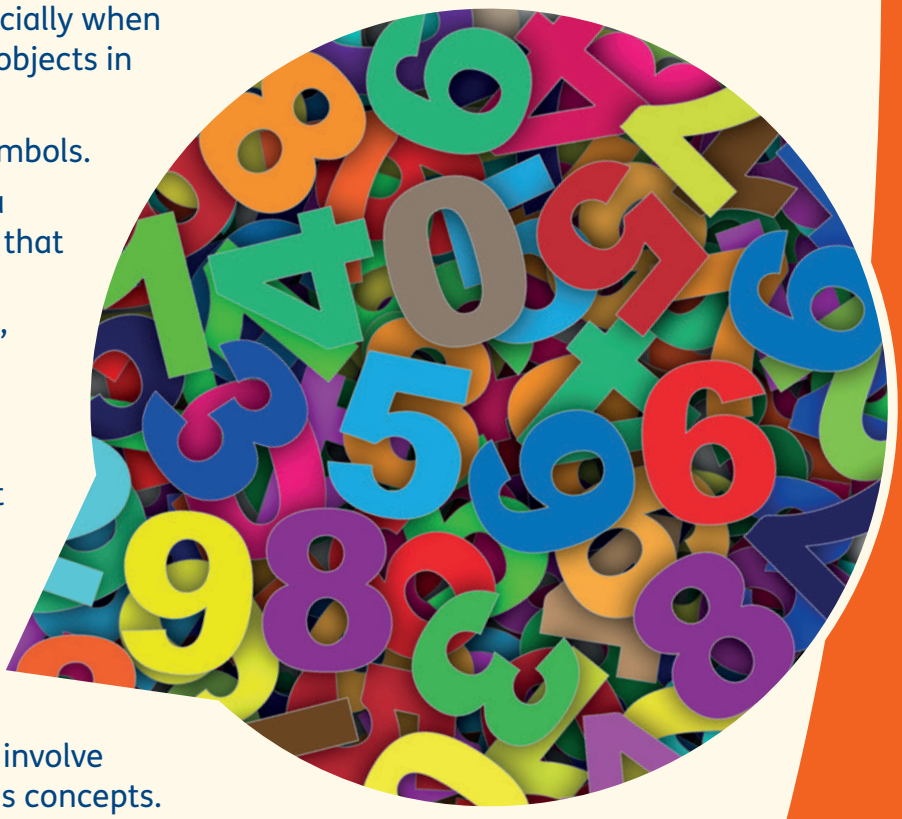
It is estimated that dyscalculia affects 4 – 6% of the population and it often co-occurs alongside other specific learning difficulties such as dyslexia and dyspraxia. Just as there is no single set of indicators that characterises dyslexia, there are a number of areas which can cause dyscalculic difficulties. These could include written number problems and difficulties caused by poor working memory.

See a definition of dyscalculia on the Addressing Dyslexia Toolkit website. https://addressingdyslexia.org/what-is-dyslexia/what-is-dyscalculia/

In general, people with dyscalculia have poor 'number sense'. Number sense is an intuitive understanding of how numbers work. Number sense is at the core of maths learning. In a similar way that a lack of phonemic awareness causes people with dyslexia to struggle with reading, a lack of number sense causes people with dyscalculia to struggle with maths concepts. If individuals don't understand the basics about how numbers work, learning maths and using it every day can be very frustrating.

Signs of Dyscalculia in pre-school children

- Has trouble learning to count, especially when it comes to assigning a number to objects in a group.
- Has trouble recognising number symbols.
- Struggles to connect a number to a real-life situation, such as knowing that '3' can apply to any group that has three things in it – 3 biscuits, 3 cars, 3 toys.
- Has trouble remembering numbers and skips numbers long after other children of the same age can count and remember numbers in the right order.
- Finds it hard to recognise patterns and sort items by size, shape or colour.
- Avoids playing popular games that involve numbers, counting and other maths concepts.



Signs of Dyscalculia in Primary School

- Has trouble recognising numbers and symbols. For example making the connection between '7' and the word 'seven'.
- Has trouble writing numbers clearly or putting them in the correct order or the correct column.
- Has trouble coming up with a plan to solve a maths problem.
- Struggles to understand words related to maths such as 'greater than' and 'less than'.
- Can have trouble telling left from right and has a poor sense of direction.
- Has difficulty remembering phone numbers and game scores.
- Avoids playing games that involve number strategies.
- Has difficulty learning and recalling basic maths facts.
- Struggles to identify symbols such as +, -, ×, ÷ and use them correctly.
- May still use fingers to count instead of using more sophisticated strategies.
- Has trouble telling the time.

Signs of Dyscalculia in High School and adults

- Anxiety when it comes to numbers.
- Struggles to apply maths concepts to everyday life. This includes money matters such as estimating the total cost, working exact change and working out a tip.
- Has trouble measuring things like ingredients in a simple recipe. Would struggle to double or halve quantities in a recipe.
- Struggles with finding their way around and worries about getting lost.
- Has a hard time grasping information shown on graphs or charts.
- Has trouble finding different approaches to the same maths problem.
- Lacks confidence in activities that require estimating speed and distance, such as playing sports and learning to drive.
- Struggles to read scales such as thermometers.

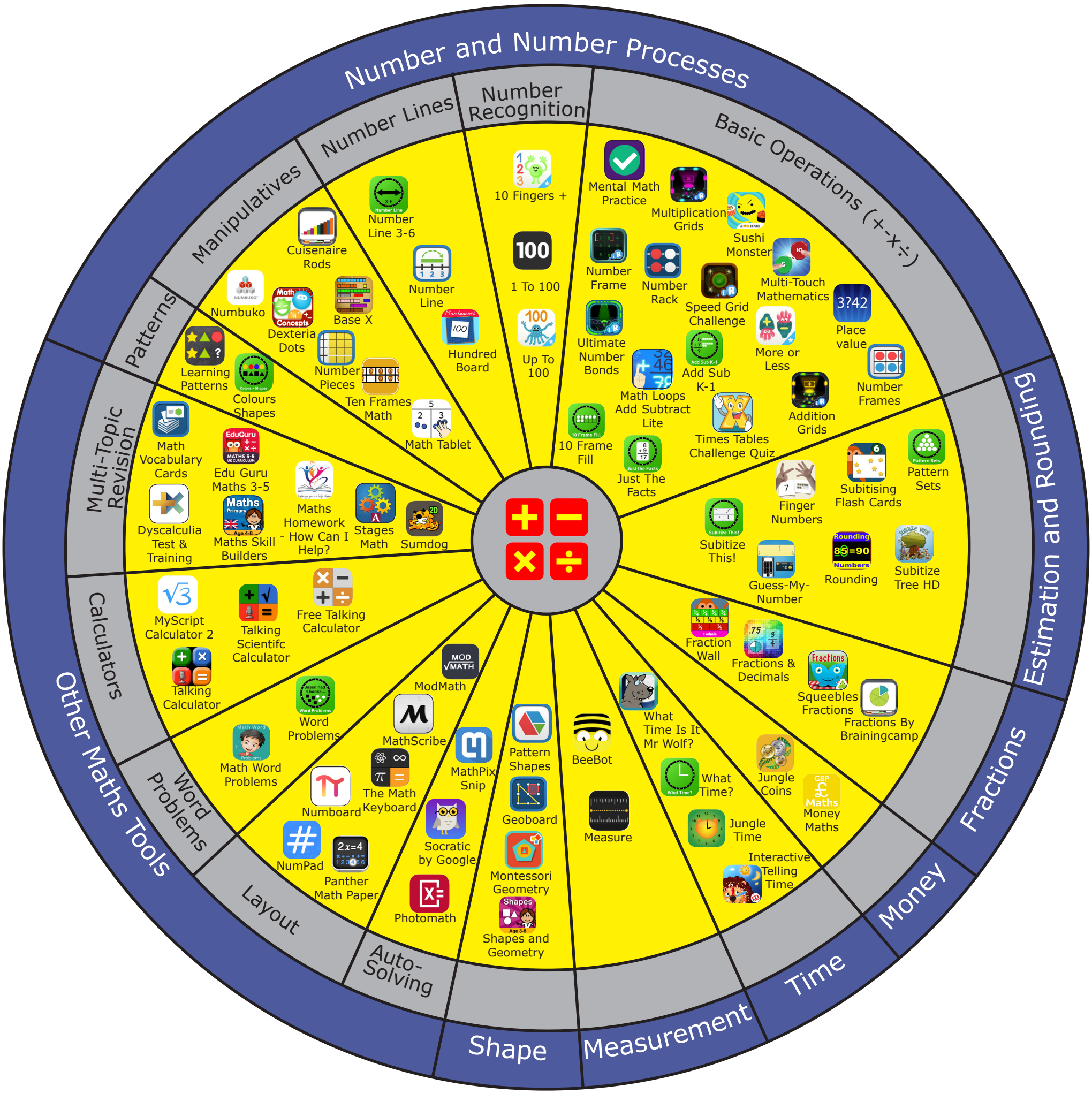
It is important to note that these are just indicators and are not the same as an assessment of dyscalculia.

Further information

- www.dyscalculia.me.uk
- www.callscotland.org.uk (visit their list of Maths Apps)
- **Dealing with Dyscalculia: Sum Hope** by Steve Chinn
- **Dyslexia, Dyscalculia and Mathematics** by Anne Henderson
- Dyslexia Scotland Helpline 0344 800 8484 or helpline@dyslexiascotland.org.uk

Dyslexia Scotland
Charity No: SC 000951
Registered No: SC 153321

iPad Apps for Learners with Dyscalculia/ Numeracy Difficulties



iPad Apps for Learners with Dyscalculia/Numeracy Difficulties is one of over 30 posters available from the Downloads section of the CALL Scotland web site. It was first launched in October 2017 and has been downloaded nearly 12,000 times. Since our last update a few apps have disappeared; others have had their names / icons or web addresses changed and we have added 10 apps to the poster.

The wheel is by no means comprehensive but tries to find apps that will help to embed numerical learning and to give opportunities for repeated practice of concepts that cause difficulty. We would stress that, particularly for dyscalculia and maths, individual apps provide useful practice and reinforcement, but are not a substitute for sound teaching.

If you use the electronic version, clicking on the individual app names or icons will take you to information on each app in the Apple App store.

CALL Scotland runs courses on Technology to support Dyslexia and Dyscalculia at our centre in Edinburgh and at your school, by request:

https://www.callscotland.org.uk/professional-learning/.

Some developers have chosen to make their resources available through a web site, rather than develop separate apps for the various laptops and tablets used in schools. We therefore decided to include a short list of web sites with relevant online activities in this poster.

- Coolmath4Kids
- Crickweb
- Doorway Online
- Helping with Math
- Math Playground
- Studyladder
- TES Elements – Maths
- Twinkl – Primary Resources - Maths

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CALL Scotland is part funded by Scottish Government.
An electronic version of this chart can be downloaded from:
http://www.callscotland.org.uk/downloads/posters-and-leaflets

CALL Scotland
Communication, Access, Literacy and Learning

Ideas for supporting maths

Children, Parents & Teachers

Some problems with maths may be related to dyslexia. These problems are different from – but may overlap with – difficulties caused by dyscalculia.

Difficulties in primary school

- Learning the vocabulary of maths
- Confusion with signs such as + and × or – and ÷
- Confusion with reversing numbers such as 6 and 9 or 2 and 5
- Difficulty in memorising multiplication tables
- Directional confusion in calculations such as subtraction
- Directional confusion with tables such as bus/train timetables
- Sequencing – writing 18 as 81 or 29 as 92
- Place value
- Difficulty with mental arithmetic because of short term memory difficulties
- Difficulty with understanding a question which involves words

How to help in primary school

- Help with the vocabulary. Sometimes there is more than one expression for the same thing which can be confusing – for example 'subtract', 'take away', 'minus'.
- Give as much practical experience as you can. For example, with money, use real coins to increase practical understanding and experience.
- Use concrete examples to illustrate ideas. Building a tower of bricks helps with counting. Cutting a cake or pizza into portions helps with fractions.
- Help raise awareness of direction, for example, working from right to left for addition. Tables might have to read from both top to bottom and from left to right.
- Talk about numbers – TV Channels, dates, birthdays, house numbers, page numbers, phone numbers.
- Count when skipping, scoring goals, climbing stairs (then try doing this two at a time).
- Use children's games to work on numbers. For example Connect 4, dominoes, board games such as Snakes and Ladders (great for counting forwards from different numbers, and not just from 1).
- Use terminology used in maths, including the same, more than, less than, how many, how many more.
- Make games such as 'pairs' with cards to help match symbols.
- Time – discuss the concepts of time in different ways, for example, day and night, early and late.
- Encourage them to help with things like cooking – using weighing and measuring. By putting these skills into practical 'real life' tasks, it can aid understanding.

Difficulties in secondary school

- Vocabulary will become more demanding
- Sequencing might be more of a problem: 30 31 32 34
- Greater difficulty with wordy problems, especially extracting the numerical information and knowing where to start with the calculation
- Knowing where to start in a calculation or remembering the correct order of steps
- Able to come up with the correct answer but be unable to show the working
- Graphs and three-dimensional work might be difficult – or it might be much easier than numerical calculations
- Algebra might be confusing

How to help in secondary school

- Help with learning and understanding vocabulary.
- Read through questions together. Help extract the numerical information and work out the steps needed, perhaps by drawing simple pictures. Encourage independent working.
- In an exam, marks will be given for correct working so encourage the writing down of steps during calculations.
- Help with use of a calculator.
- Find concrete examples where possible to illustrate a topic – for example, encourage them to help with something practical like a car journey by working out the mileage and time it will take to make a journey.

Further information

- Maths for the Dyslexic: A Practical Guide by Anne Henderson
- Supporting Students with Dyslexia in Secondary Schools by Moira Thomson
- Mathematics Learning Difficulties, Dyslexia and Dyscalculia by Steve Chinn
- Working definition of dyscalculia: www.addressingdyslexia.org
- Dyslexia Scotland Helpline 0344 800 8484 or helpline@dyslexiascotland.org.uk

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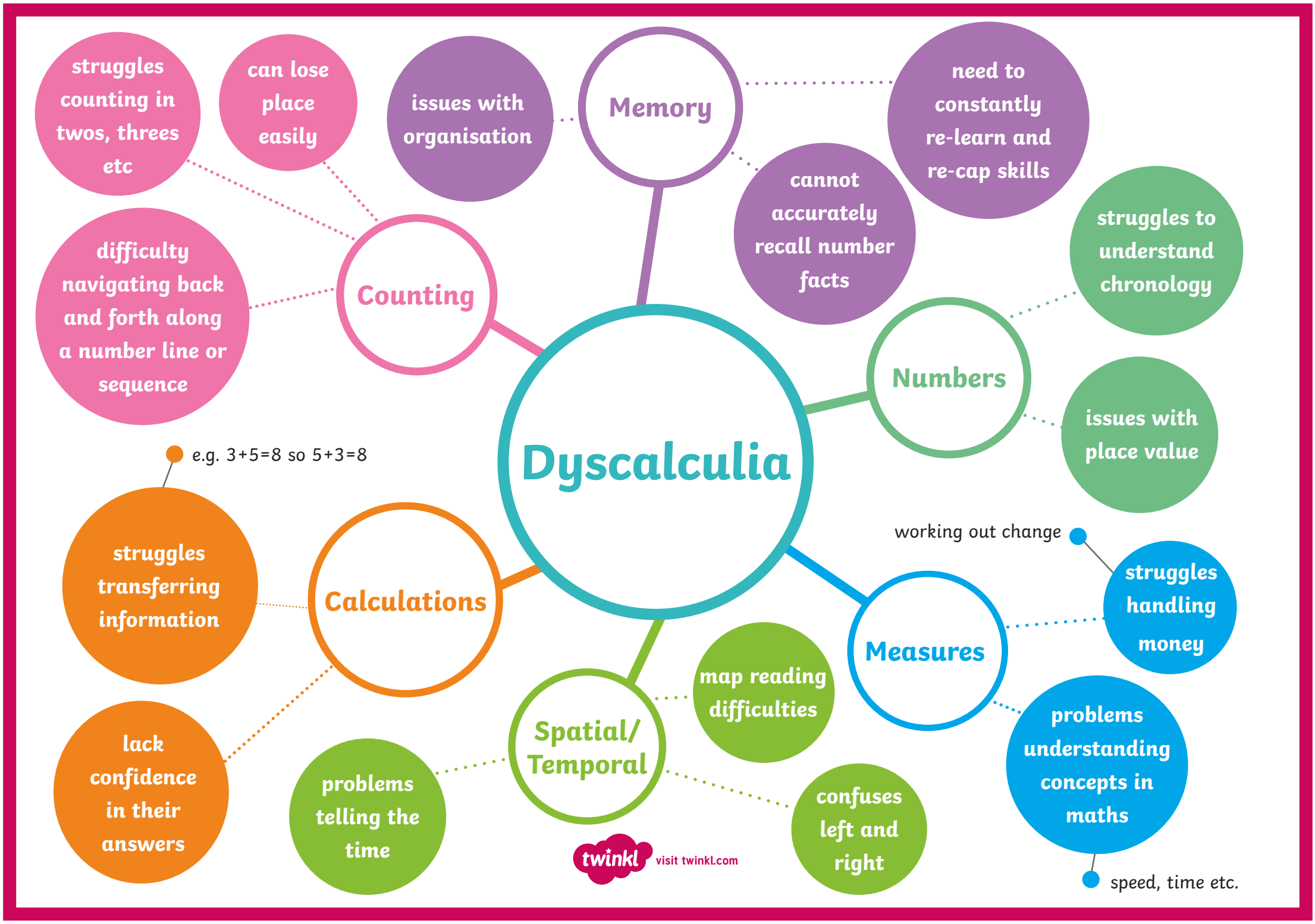
Technology: numeracy checklist for learners with dyscalculia

If you…	learn how to…with…	Windows	ChromeOS	iPad
mix up numbers or confuse maths symbols…	▪ write numbers with a keyboard ▪ write expressions with an equation editor ▪ read numbers and symbols with text-to-speech.	Do column calculations with CALL Maths template (Word and PDF). Microsoft Office Equation Editor	Do column calculations with CALL Maths template (Word and PDF). Google Docs Equation Editor	Do column calculations with CALL Maths template (Word and PDF). Pages Equation Editor
confuse dates and times…	▪ read dates and times with text-to-speech.	Use Natural Reader or the built-Read Aloud	Use the built-in Select to Speak .	Try the iPad/iPhone built-in Speak Screen.
find it hard to get information from graphs and charts…	▪ use digital graphs and charts and ✓ zoom in/out ✓ change colours ✓ highlight ✓ text-to-speech ✓ add annotations, e.g. straight lines to guide you.			
have problems holding numbers in your head when calculating…	▪ use a calculator.	Windows Calculator	Chromebook Calculator	Talking Calculator
get muddled when doing a complicated maths problem…	▪ ask your teacher for a step-by-step summary. ▪ tick off or strike out each step as you complete them.			
find it hard to remember the order of steps to solve problems…	▪ ask your teacher for a step-by-step summary. ▪ tick off or strike out each step as you complete them.			

For more ideas look at I Have a Numeracy Difficulty and with Maths, What can Help?


Dyscalculia
Counting
struggles counting in twos, threes etc
can lose place easily
difficulty navigating back and forth along a number line or sequence
Memory
issues with organisation
need to constantly re-learn and re-cap skills
cannot accurately recall number facts
Numbers
struggles to understand chronology
issues with place value
Calculations
e.g. 3+5=8 so 5+3=8
struggles transferring information
lack confidence in their answers
Measures
working out change
struggles handling money
problems understanding concepts in maths
speed, time etc.
Spatial/ Temporal
map reading difficulties
problems telling the time
confuses left and right
twinkl visit twinkl.com

Supporting Pupils with Maths Anxiety

Look for early signs

Being aware of these signs allows for early identification of maths anxiety:

- difficulties subitising
- lack of understanding of number sense
- difficulties recognising the relative size of numbers

Spotting these signs early means actions can be put in place to support pupils' maths development.

Look for physical signs of anxiety

Maths anxiety can have a physical effect on the body. For children with maths anxiety, you may notice them freezing up, feeling nauseous, having a shortage of breath, sweating, increased blood pressure or picking and biting their nails. Support children by finding ways they can ground themselves to self-regulate their emotions.

Be mindful of the psychological impact of maths anxiety

Maths anxiety can have a considerable psychological effect on pupils, which can result in low self-esteem, lack of confidence, memory loss and maths avoidance.

Using a growth mindset approach can support pupils with developing self-worth and confidence.

Be ready to adjust your teaching style

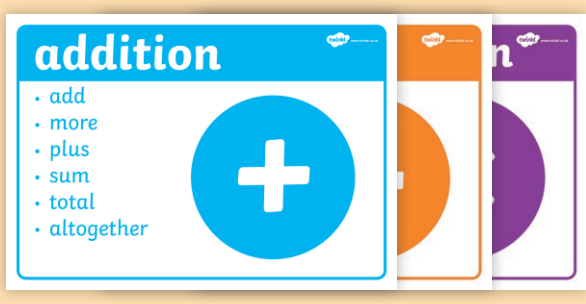
For learners with maths anxiety, preparing them on what's coming up in the lesson before it takes place is a useful strategy to help them feel prepared and confident. Quick pre-teaching sessions, interventions and daily 5-minute bursts of 1:1 maths are all useful strategies to support pupils with maths anxiety.

Chunk learning

Break learning down into a number of smaller chunks to prevent pupils feeling overwhelmed with the amount of learning they feel expected to complete, reducing the level of anxiety they experience. Use engaging maths games to re-energise the pupil you're supporting in between the key teaching points.

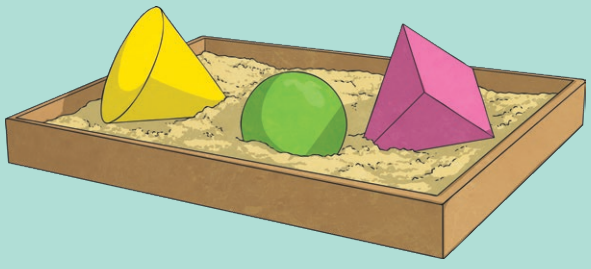
Recall key vocabulary

Vary the language you use to model the different terms which mean the same thing, allowing pupils to experience this language in context and develop their understanding. Display these terms to provide pupils with visual aids to support independence.



Concrete, pictorial and abstract

Using concrete resources, such as counters, number beads and dice, allows for a multisensory learning opportunity, allowing them to develop a deeper understanding of what makes a number.



Practise little and often

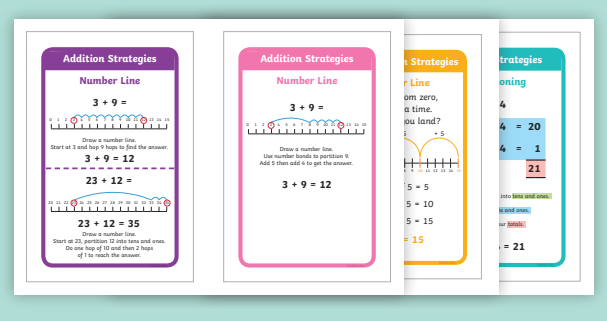
'Little and often' short bursts of learning help consolidate number facts and prevent pupils feeling overwhelmed, which they may experience when faced with a longer traditional maths lesson.

Recognise maths in everyday life

For pupils with maths anxiety, teaching maths through real-life experiences is a highly effective way to develop and apply skills in a low-pressure environment. Explore maths and apply key skills in real-life situations such as cooking, shopping and playing sports.

Take away the pressure

Reduce anxiety-increasing situations by ensuring you're teaching children strategies and methods to give them the skills to work out a maths problem, as opposed to expecting them to recite surface level facts.



Scan me for a free TA CPD session hosted by the Dyscalculia Network

Dyscalculia Network
Unlocking Numbers

Click me to visit the Dyscalculia Network

Scan me for more maths anxiety support.

twinkl

SOCIAL MEDIA LINKS

Dyscalculia Network | Facebook

The Dyscalculia Network (@DyscalculiaNet1) / X

https://www.instagram.com/dyscalculianetwork/

The Dyscalculia Network - YouTube

CALL Scotland | Edinburgh | Facebook

CALL Scotland (@CALLScotland) / X

https://www.instagram.com/callscotland/

callscotland1983 - YouTube