

# ABOUT DYSCALCULIA FACT SHEET



Dyscalculia is a specific learning disorder (SLD) associated 'with significant difficulty understanding numbers and working with mathematical concepts.' (DSF Literacy and Clinical Services, 2022).

AUSPELD defines dyscalculia as:

"a condition that affects the ability to acquire arithmetical skills. Learners with dyscalculia may have difficulty understanding simple number concepts, lack an intuitive grasp of numbers, and have problems learning number facts and procedures. Even if they produce a correct answer or use a correct method, they do so mechanically and without confidence (Auspeld, 2019, p. 10)".

Dyscalculia is also described as a subset of an SLD with impairment in mathematics. Specific criteria are used to determine whether a learner has an SLD with impairment in mathematics. SLD in mathematics is indicated by both:

- the presence of difficulties that have persisted for at least 6 months (even with interventions that target those difficulties)
- the affected academic skills being substantially and quantifiably below those expected for the individual's chronological age.

These difficulties are not because of intellectual disabilities, uncorrected vision or hearing, or lack of proficiency in the language of academic instruction, or inadequate educational instruction (American Psychiatric Association, 2022).

See the online practice guides for full references and to find out more:

[edi.sa.edu.au/practiceguidance](http://edi.sa.edu.au/practiceguidance)



**Government  
of South Australia**

Department for Education

## Understanding dyscalculia

A learner with dyscalculia or an SLD in mathematics will be resistant to targeted interventions. They will also have more difficulties than:

- learners with general learning difficulties
- those who have not had adequate learning instruction in one or both of:
  - mastering number sense, understanding the concept of number, retrieving number facts, and calculations
  - number fluency, mathematical reasoning and problem solving.

(Auspeld 2019, Education Scotland 2022)

## Impact of dyscalculia on learning

Students may have dyscalculia or an SLD in mathematics if they both:

- experience significant difficulty understanding number and mathematical concepts
- do not respond well to explicit, systematic and cumulative support.

There are different key indicators of dyscalculia at different levels of schooling (Auspeld, 2019).

### Preschool

Learners can have unexpected difficulty with:

- learning to count and connecting numbers to groups of things
- recognising patterns, number symbols and sorting objects (colour, shape, size)
- an accurate sense of time.

### Junior primary school

Learners can have unexpected difficulty with:

- organising objects and sets of items in a logical way
- using counting strategies (counting in 2's, 5's and so on) and counting on
- mastering number knowledge (recognising how many items make a set without counting)
- remembering arithmetic facts and decomposing numbers.

### Primary school

Learners can have unexpected difficulty with:

- inattention to numerical operator
- multi-step calculation procedures and delays in applying concepts of place value
- telling the time and recalling times tables and retrieval of overlearned number facts
- measurement and understanding spatial relationships.

They can also have:

- increased anxiety and negative attitude towards mathematics.

### Secondary school

Learners can have unexpected difficulty with:

- learning and recognising mathematics vocabulary and mathematics concepts
- finding more than one way to solve a mathematics problem
- reading and interpreting graphs, charts and maps and delays in spatial directions.

They can also have:

- poor perception of the passage of time and difficulties sticking to a schedule.

## Strengths of learners with dyscalculia

The strengths of learners with dyscalculia can be in:

- having good verbal communication skills
- having good problem-solving skills
- being creative, intuitive and lateral thinkers
- being stronger in areas of art, music and design
- seeing the bigger picture and being strategic and holistic thinkers.

(University of Oxford, 2022)

# DYSCALCULIA ADJUSTMENTS



## EXAMPLES OF ADJUSTMENTS



### Preschool

- Incorporate multi-sensory activities into daily lessons. For example, encourage children to join in with actions for songs or instructions using rhythmic movement sequences.
- Provide play-based learning for patterning to develop number sense and sequence. For example, use threading beads, clothes pegs, lacing cards and other small manipulatives.
- Incorporate the language of math in play-based learning activities to help language development, storytelling, and creativity.
- Provide activities to identify numbers, counting, and comparing through drawing and singing.



### Primary school

- Model and provide a worked example that underlies strategies and thinking.
- Provide access to concrete materials and manipulatives (for example Cuisenaire rods, MAB blocks, Bond Blocks, counters) to develop number concepts and to help students to construct visual mental models.
- Use visual and verbal strategies to teach mathematics concepts. For example, colour-code fact families and multiplication facts for your student. You could colour  $2+3=5$ ,  $3+2=5$ ,  $5-2=3$ ,  $5-3=2$  in green, and  $3+4=7$ ,  $4+3=7$ ,  $7-3=4$ ,  $7-4=3$  in blue.
- Prepare multiple representations of the same information (for example, numbers can be represented with dots, objects, number and name).
- Provide evidence based numeracy program such as QuickSmart that is designed for students experiencing persistent difficulties mastering basic mathematics facts or achieving fluency in basic mathematics facts (a tier 2 adjustment).



### High school

- Use explicit instruction to teach mathematics concepts by providing examples of multi-step mathematics problems for student reference; consider colour coding.
- Teach meta-cognitive strategies and use paired learning.



### Assistive technology

- Provide text-to-speech app to read aloud text and numbers (for example talking calculators).
- Mathematics notation tools are useful to help set out equations, particularly for learners with handwriting difficulties (for example Equatio).
- Use equation solving digital tools that prompt learners through the problem-solving process. For example iDevBooks is a large collection of evidence-based mathematics apps.
- Socratic – will find the best resources to help with mathematic concepts from a picture you take of the problem.
- ModMath – an iPad app that helps to show mathematics equations and concepts.

