

Students with SLDs often have Processing Weaknesses

Phonological Processing - comprises three areas of functioning:

- 1. Phonological Awareness** - attending to the sounds and oral language patterns within words including the ability to work with syllables, and to blend and segment phonemes in words. These skills are critical to the development of good reading and spelling skills.
- 2. Phonological Memory** - the ability to hold on to speech-based information in short-term memory. We rely heavily on our phonological memory when reading and spelling in order to accurately recall the sequence of sounds we hear or read.
- 3. Rapid Automatised Naming** - the ability to quickly identify and name a series of common stimuli (e.g. letters, numbers, colours, objects). Students with a poor RAN score (and, therefore, difficulties with rapid word retrieval) tend to have weaknesses in reading and writing fluency.

Students who have a weakness in one or more of these areas are likely to experience literacy-learning difficulties.

Orthographic Processing

Orthographic processing is the ability to understand and recognise the writing conventions (spelling rules, letter patterns, capitalisation, hyphenation, and punctuation) of the writing system of any given language, as well as recognising when words contain correct and incorrect spellings.

Becoming a fluent reader requires both the capacity to utilise sound-based decoding strategies and the ability to accurately recognise familiar letter patterns either as whole words (e.g. 'was') or within words (e.g. night). The ability to rely less heavily on sound-based decoding strategies is very much dependent on the development of orthographic processing.

Students with weak orthographic processing:

- rely very heavily on sounding out common words making reading choppy and laborious
- have difficulty applying knowledge of base words in order to decode a variation of a word
- confuse simple, similar looking words
- may have ongoing difficulties in letter recognition and letter reversal
- may have slow reading fluency and poor reading comprehension skills
- have a high rate of spelling errors and poor written expression skills.

Working Memory

The ability to hold information in mind and manipulate it as necessary for a brief period. Working memory is highly correlated with both literacy and numeracy achievement levels and is resistant to change.

Within the classroom, there are many tasks that place a heavy load on working memory:

- Remembering multi-step instructions
- Performing mental maths sums
- Reading comprehension
- Constructing written expression
- Spelling a long or complex word
- Recalling details from a spoken passage or story.



Other areas of difficulty

The presence of other developmental disorders such as developmental language disorder (DLD) or developmental coordination disorder (DCD) will contribute to the learning difficulties experienced by a student in the classroom. In addition, difficulties in attentional control and other aspects of executive functioning and/or processing speed may also help to explain a student's academic underachievement. These difficulties may provide a better explanation for the challenges a student is experiencing or, in some cases, will occur alongside an identified SLD. Students with difficulties of any kind are likely to require targeted intervention as well as strategies and adjustments designed to meet their individual needs.

Specific Learning Disorders Flow Chart

What are Specific Learning Disorders (SLDs)?

Specific learning disorder with impairment in reading (dyslexia)

Dyslexia can be defined as a specific learning disability that is neurological in origin. It is characterised by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.*

When looking at identifying a specific learning disorder with impairment in reading (dyslexia), deficits in one or both of the following key academic areas are usually present:

- Inaccurate or slow and effortful word reading.
- Difficulty understanding the meaning of what is read.

These difficulties frequently result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.



Specific learning disorder with impairment in written expression

A specific learning disorder with impairment in written expression is a persistent difficulty with written expression, handwriting and/or spelling that may occur in isolation, but more often, occurs in conjunction with dyslexia.

It can be defined as a specific learning disability that is neurological in origin. It is characterised by difficulties with accurate and/or fluent written expression and by poor spelling and handwriting skills. These ongoing delays in writing are often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Deficits in one or both of the following key academic areas are usually present:

- Difficulties with spelling.
- Difficulties with written expression.

These difficulties frequently result from a combination of deficits in the phonological component of language as well as in orthographic processing, and in working memory.



Specific learning disorder with impairment in mathematics (dyscalculia)

A specific learning disorder with impairment in mathematics (dyscalculia) is an innate difficulty in learning and comprehending mathematics. Children who have a specific learning disorder with impairment in mathematics (dyscalculia) have trouble understanding numbers, learning how to manipulate numbers, learning mathematical facts, and a number of other related difficulties. Dyscalculia can be defined 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. Deficits in one or both of the following key academic areas are usually present:

- Difficulties mastering number sense, number facts or calculation.
- Difficulties with mathematical reasoning.

These difficulties frequently result from a combination of deficits in phonological memory, rapid naming, and working memory.





*This definition is the preferred definition of DSF and AUSPELD, as well as the International Dyslexia Association (IDA) and the National Institute of Child Health and Human Development (NICHD).

Specific Learning Disorders Flow Chart

	Functional Impact Within the Classroom	Implications for Intervention
SLD with impairment in reading	 Accuracy – often reads single words both aloud and silently incorrectly, frequently guesses words, has difficulty sounding out words, and an inability to read unfamiliar words, reducing ability to comprehend text.	<ul style="list-style-type: none"> Focus on developing phonological awareness and phonemic awareness skills to strengthen the understanding of the sound structure of words and the ability to hear and manipulate the sounds in words. Improve phonics knowledge using a Structured Synthetic Phonics (SSP) Program.
	 Fluency – reading is slow and laboured with frequent pauses and hesitations, reducing ability to recall and comprehend text.	<ul style="list-style-type: none"> Ensure phonics knowledge is consolidated with a SSP Program. Use repeated oral readings of simple, decodable text with an initial focus on accuracy and gradually increasing in speed.
	 Comprehension – may read text accurately and fluently but not understand the sequence, relationships, inferences, or deeper meanings of what is read.	<ul style="list-style-type: none"> Ensure reading accuracy and fluency abilities are targeted. Develop oral comprehension skills, including receptive vocabulary. Teach specific reading comprehension strategies. Teach the use of comprehension aids, such as highlighting key information.
SLD with impairment in written expression	 Accuracy – may add, omit or substitute vowels or consonants when spelling, may produce similar looking words, or words with a similar meaning, and reduced ability to write fluently due to poor spelling skills.	<ul style="list-style-type: none"> Develop phonological awareness and phonemic awareness skills. Improve phonics knowledge using a SSP Program. Develop knowledge of orthographic rules. Introduce and explain homophones. Develop knowledge of word origins.
	 Grammar – makes multiple grammatical or punctuation errors within sentences.	<ul style="list-style-type: none"> Explicitly teach grammar and punctuation skills using resources such as 'How to' book series or 'Grammar Magic' program, 'Jumpstart! Grammar'. Utilise a program that focuses on developing oral understanding and learning of the story to scaffold the writing process, such as the Talk for Writing program.
	 Clarity – employs poor paragraph organisation and written expression of ideas lacks clarity.	<ul style="list-style-type: none"> Teach strategies that enable students to combine sentences to form well-structured paragraphs. Use a program that introduces the process of writing based on planning and outlining, drafting, revising and editing, and writing a final copy in a clearly structured, logical sequence.
SLD with impairment in mathematics	 Number Sense and Memorisation of Number Facts – has poor understanding of numbers, their magnitude, and relationships; and counts on fingers to add single-digit numbers instead of recalling the math facts as peers do.	<ul style="list-style-type: none"> Explicitly teach counting on/back, step counting and number recognition utilising visual aids and a concrete apparatus such as number squares and bead strings. Utilise maths games and activities that develop numerosity and numbersense, and maths facts, such as the Paul Swan series of books.
	 Accurate or Fluent Calculation – gets lost in the midst of arithmetic computation and may switch procedures.	<ul style="list-style-type: none"> Utilise number lines to teach early calculation skills. Teach foundational knowledge and proceed in small progressive steps with frequent repetition of material and practise of skills until they appear to be mastered. Teach a strategic approach for practicing and recalling information.
	 Accurate Maths Reasoning – has severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems.	<ul style="list-style-type: none"> Utilise a comprehensive mental mathematics program such as Junior Elementary Maths Mastery or Elementary Maths Mastery Program. Vary instructional strategies, using different manipulatives, examples and visual aids as necessary to assist student's understanding. Pre-teach math vocabulary.

Possible Adjustments and Accommodations
<ul style="list-style-type: none"> Remove the reading component of tasks of tests that are not literacy focussed by providing a reading buddy or utilising assistive technology such as a reading pen. Provide information in other formats rather than written form alone.
<ul style="list-style-type: none"> Allow extra time to complete reading, particularly during tests. Reduce the amount of reading that is expected.
<ul style="list-style-type: none"> Use story maps and graphic organisers to assist with gaining meaning from passages. Simplify written questions and instructions.
<ul style="list-style-type: none"> Allow content knowledge to outweigh spelling in written expression tasks. Provide a word bank or glossary of terms relevant to the topic. Encourage the use of assistive technology when the purpose of the assessment is not spelling (e.g. word prediction software, talking spell check).
<ul style="list-style-type: none"> Issue writing guidelines, templates, and paragraph headings to support the structure of extended writing. Provide access to a computer for written work and make sure that editing features and the spellchecker are used.
<ul style="list-style-type: none"> Provide alternative modes of assessment such as oral work, illustration, or multiple choice formats, as a substitute for a long written assignment. Provide a framework or scaffolding for extended writing tasks.
<ul style="list-style-type: none"> Allow the use of a calculator and/ or computer software programs. Provide a times table chart for use during mathematical calculations and multi-step problems. Adjust the amount of maths work and/or amount of time.
<ul style="list-style-type: none"> Provide graph paper to assist in the organisation of digits when completing maths sums. Provide a list or diagram of steps in a mathematical process.
<ul style="list-style-type: none"> Make problems easier to understand by revising sentences to be shorter and more direct.

Other Factors to consider
 <p>Cognitive Overload</p> <p>Often, a lack of cumulative knowledge as a result of ongoing difficulties in one or more of these specific aspects of learning, in combination with underlying processing difficulties, may result in feelings of stress or pressure within the classroom, increases in anxiety particularly during timed tasks, and difficulty dealing with large tasks, large amounts of information or lengthy instructions.</p> <ul style="list-style-type: none"> Use explicit teaching strategies to focus on areas of need. Check for understanding of task requirements, particularly as complexity increases. Explicitly teach planning and organisation strategies to help students manage lengthy tasks. Limit memory demands through the teaching of memory aides such as mnemonics and the use of concrete manipulatives.
 <p>Socioemotional Impact</p> <p>Ongoing difficulties in one or more of these aspects of learning can often result in, low self-esteem or academic self-concept, feelings of anxiety when encountering tasks they find difficult, and even depression. Behaviours such as school refusal, distractibility, inattention, and misbehaviour can sometimes result.</p> <ul style="list-style-type: none"> Utilise a school based program to develop coping skills, goal setting, positive thinking, problem solving and assertiveness such as "Success and Dyslexia". If there is a mental health problem present alongside a learning disability, this needs to be addressed, both for the child's wellbeing and to improve the effectiveness of remediation attempts. Support from a Psychologist or therapist may be required.