

Understanding Learning Disabilities - How Processing Affects Learning

A chart designed to be used for starting points to think, plan and support programming in response to a student's assessed areas of strength and/or need

Phonological Processing	Language	Visual-motor Skills	Visual-spatial (perceptual) Skills
Definition			
<p>Phonological Processing: Refers to the use of phonological information, especially the sound structure of oral language, in processing written and oral information. Two key parts of phonological processing are phonological awareness and phonemic awareness. <i>Phonological awareness</i> is the awareness that spoken language can actually be broken down into smaller parts. <i>Phonemic awareness</i> is the knowledge that words can be broken into individual sounds (phonemes). This knowledge is critical to being able to make sense of how letters and sounds are combined in reading and writing.</p>	<p>Language Processing: Language can be divided into comprehension and expression across all of its domains – oral, non-verbal, reading and writing – any of which can be affected in individuals with LDs. Language is part of all aspects of our experience; it is essential for expressing ourselves, addressing our needs and connecting with others.</p>	<p>Visual-motor Skills: refers to the ability to co-ordinate the eyes and hands to produce/guide physical movements such as the production of written work.</p> <p>A deficit in this area can make it difficult to co-ordinate small or large movements, such as copying information from the blackboard or catching a ball while running.</p>	<p>Visual-spatial (perceptual) Processing: refers to the ability to organize visual information into meaningful patterns.</p> <p>Visual-spatial processing deficits can show up as problems understanding and making sense of visual information, e.g. figure-ground discrimination, perceiving constancy despite changes in context, or the perception of spatial relationships between objects.</p>
Possible Signs			
<p>Students may have difficulty:</p> <ul style="list-style-type: none"> Identifying rhyming words Making rhyming words Breaking a word into chunks (i.e. syllable segmentation) Clapping the number of words in a sentence Separating sounds in words (e.g. s-t-o-p) Blending sounds to make words Remembering sounds in spoken and written words Connecting their sound awareness to their sound-symbol knowledge <p>What you may see: student has difficulty with rhyming, does not hear differences in sounds, has difficulty knowing that 'plate' without the /p/ would make 'late', has difficulty spelling phonetically and has difficulty learning to read despite numerous teaching opportunities.</p>	<p>Students may have difficulty:</p> <ul style="list-style-type: none"> Understanding and expressing vocabulary Following and giving directions Comprehending and using word order and grammar in sentences Understanding and producing stories and conversations Understanding and expressing factual and abstract information, humour, figurative language and nuances With verbal and non-verbal social communication With reading and writing <p>What you may see: student may appear as if he/she isn't paying attention when he/she actually cannot understand the language of the instructions; may look dazed or uninterested; may look confused and respond with an out-of-context remark; may use brief, fragmented sentences and have difficulty verbally expressing/communicating his/her ideas; may have a delayed pause before responding; may take a literal interpretation to social interactions.</p>	<p>Students may have difficulty:</p> <ul style="list-style-type: none"> Copying accurately Responding quickly on motor tasks Coordinating where their body is in space With pencil grip Cutting, colouring and tracing With hand-eye co-ordination (e.g. difficulty with mazes, dot-to-dot/tracing) Writing for extended periods of time With motor clumsiness, learning new movements in physical education classes (e.g. dribbling a basketball or volleyball serve) Placing letters on lines Making good use of space on paper <p>What you may see: written work is slow, difficult and laborious. Student may try to avoid written tasks even though he/she is able to understand what is expected and is able to share information orally.</p>	<p>Students may have difficulty:</p> <ul style="list-style-type: none"> Remembering and telling the difference between left and right Understanding visual patterns Understanding how parts fit together to make a whole Estimating or comparing visual lengths and distances Remembering letter formations and letter patterns Knowing how to use transitional words appropriately (e.g. first, then) Picking out important visual details Reading or working with charts, maps, tables, graphs and pictures to extract the needed information Arranging materials in space, such as in their desks, lockers, or rooms at home Noticing visual details Copying information from far-point, like the blackboard or from near-point, like texts Organizing space on a page Organizing materials and assignments Reading and accurately interpreting social and body cues <p>What you may see: student may write messily, misjudge social cues, get lost easily, appear to be clumsy, and/or bump into walls.</p>
Instructional Strategies			
<ul style="list-style-type: none"> Provide clapping, rhymes, word patterns, singing and chanting to build student's awareness of the parts of words and sentences Provide direct instruction in combining sounds and small words into bigger chunks (e.g. cow+boy=cowboy) Use visual sequences (e.g. manipulatives to represent sounds) Provide visual prompts (e.g. cover chunks of words) Consider use of multi-sensory methods to develop sound/symbol association (e.g. visual auditory, kinesthetic-tactile senses) 	<ul style="list-style-type: none"> Use prior knowledge to teach new vocabulary Provide definitions for new terms and concepts before teaching the lesson Use modelling to teach concepts Present information using a variety of visual and concrete formats Keep the language of instruction as simple as possible Paraphrase questions using more simple language Teach the student to repeat directions and to ask for clarification if needed Teach the student to create a visual image of what is heard Teach new vocabulary in the context of information that the student already knows on the topic (prior knowledge) Explicitly teach and model reading and writing skills Teach written language skills (e.g. how to write expository, argumentative, persuasive essays) Provide concrete examples with main features identified as models to follow; teach the use of an editing checklist which includes making a plan, organizing ideas into paragraphs, vocabulary words to use, grammatical structure and ways of concluding Teach the student to understand and look for indicators of feelings and other non-verbal information 	<ul style="list-style-type: none"> Allow the option of printing or cursive writing or typing Allow for larger printing or writing Provide photocopied notes Use word processing or speech to text software When copying is required, do not require speed Avoid large amounts of written work Consider teaching keyboard skills Break down complex motor tasks into parts for instruction Use student's strengths to support instruction (e.g. describe with language in addition to modelling/demonstrating expectations) Have the student master parts of complex motor sequences before combining movements in a fluid pattern (e.g. ensure the student can grasp and hold the ball before throwing it) Provide extra practice for new motor skills (e.g. learning to dribble the basketball, or serve the volleyball, including printing and cursive writing) 	<ul style="list-style-type: none"> Pair visual concepts and information with verbal explanations and instructions Teach the student to write from left to right Provide the support of clear verbal instructions with demonstrations, or visual cues, for tasks requiring spatial organization Encourage the student to use verbal mediation to talk himself/herself through visual or spatial work When written output including copying is required, allow extra time for the student to proofread for accuracy Provide extra visual structure on worksheets and assignments Provide clear verbal instructions with a demonstration of the activity Use organizers like numbered boxes or colour codes Provide graph paper and lined paper for use when completing math exercises Limit use of visual strategies that are confusing, such as webs, diagrams, charts and schemas for math operations Reduce the amount of visual clutter Provide clear verbal instructions
Environmental Strategies			
<ul style="list-style-type: none"> Preferential seating away from sources of noise or distraction Arrange word walls in order of increasing complexity of sounds 	<ul style="list-style-type: none"> Seating student away from sources of noise or distraction and/or close to teacher Provide and post on walls anchor charts, learning goals and success criteria 	<ul style="list-style-type: none"> Provide instructional materials in close proximity to the student to reduce visual-motor demand (e.g. copying from a distance) Prepare student work space (e.g. desk) with materials required for task completion to reduce visual-motor demands 	<ul style="list-style-type: none"> Keep work space free of visual clutter that is not necessary to the task Simplify visual displays and include explicit information
Assessment Strategies			
<ul style="list-style-type: none"> Provide a variety of assessment methods including oral testing Provide access to resources such as spell check and/or a personalized word bank to prompt use of words and sentences when spelling is not the focus of the assessment 	<ul style="list-style-type: none"> Ensure that the student understands directions Use a variety of assessment methods with low language demands (e.g. multiple choice, short answer, visual presentations, models, charts, etc.) Minimize the requirement for oral presentations 	<ul style="list-style-type: none"> Use a variety of assessment methods for tasks with high motor demands (e.g. written output, art, gym activities) Assessment methods to reduce written output may include oral, use of Assistive Technology, fill in the blank, multiple choice, short answer, diorama Do not time written output (e.g. math sheets) or penalize for slow completion 	<ul style="list-style-type: none"> Use a variety of assessment methods: emphasize verbal and written answers, rather than charts, diagrams and maps Provide manipulative materials when assessing concepts involving spatial relationships Provide only a few questions and plenty of white space per page For written output including copying, allow extra time for student to proofread for accuracy
Possible Assistive Technology (Based on individual student needs, SEA guidelines apply)			
<p>Word Prediction: Highlight words to hear how word is pronounced</p> <hr/> <p>Text to Speech: Hear text read to students</p> <hr/> <p>Graphic Organizer: Main ideas displayed in alternative format to text</p>	<p>Word Prediction: Support with predicting words as they express ideas in writing</p> <hr/> <p>Voice to Text Express ideas using microphone and software types information</p> <hr/> <p>Text to Speech Software reads assignments or test questions to support reading fluency</p>	<p>Speech to Text Software converts spoken words into written text</p> <hr/> <p>Text to Speech/ Optical Character Recognition Use Kurzweil to drag and drop information without needing to re-type</p> <hr/> <p>Graphic Organizer Organize information</p>	<p>Text to Speech Software uses cues and prompts to draw attention to critical features (e.g. highlight key elements)</p> <hr/> <p>Graphic Organizer: Review key concepts in alternative format</p>

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Memory	Processing Speed	Attention	Executive Function
<p>Memory: refers to the ability to retain information whether for the short-term or long-term.</p> <p>Short-term memory– the storage of a small amount of information for a short period of time without rehearsal</p> <p>Working memory– the ability to hold information in mind to work with it or apply it</p> <p>Long-term memory– the storage of information for longer amounts of time</p> <p>Retrieval– involves the use of strategies to quickly and efficiently access information; can be recall and/or recognition</p>	<h2>Definition</h2>		<p>Executive Function: refers to the ability to plan, organize and monitor learning, behaviour and emotions (e.g. like the conductor of the orchestra that coordinates the processes involved in learning). Executive function develops over time.</p> <p>It is crucial to developing study strategies and becoming a better learner.</p>
<p>Students may have difficulty:</p> <ul style="list-style-type: none"> Remembering information they have just seen and heard Following directions, especially complex multi-step directions Listening to and understanding lengthy discussions Remembering information long enough to use it and understand it Remembering information over time, such as days and weeks Remembering information without memory cues Remembering sight word recognition and spelling Remembering ideas when writing Remembering number facts and steps involved in computations <p>What you may see: student may frequently ask for repeated instructions, or look lost after instructions have been given and not remember what he/she is supposed to do.</p>	<h2>Possible Signs</h2>		<p>Students may have difficulty with:</p> <ul style="list-style-type: none"> Starting and continuing work/effort to complete tasks Planning and setting goals to complete tasks Managing long-term assignments Managing and being aware of time Organizing belongings Awareness of own performance, (e.g. proofreading and editing written work) Managing and regulating emotions Being flexible as the circumstances demand (e.g. situations, aspects of problem solving, etc.) Controlling impulses or stopping their behaviour at appropriate times (e.g. thinking before he/she speaks or acts) Understanding the effect of their behaviour on others (e.g. self-monitoring) <p>What you may see: student may often be late to class, have difficulty using his/her agenda, forget to hand in assignments, hand them in late, forget items needed to complete his/her work, and desk is often messy.</p>
<ul style="list-style-type: none"> Keep oral instructions short and simple Give a few instructions at a time and repeat as necessary Limit number of new facts, words and concepts presented in one lesson Teach the use of memory aids, such as verbal mediation or rehearsal or mnemonic strategies (e.g. HOMES for the Great Lakes) Encourage the student to apply information to enhance his/her memory and to make it meaningful for him/her Encourage and teach the student to use lists, advance organizers and personal planners as aids to memory Provide copied notes as needed Build repetition and review into each lesson, particularly for key concepts Allow the use of a calculator for math when computation skill is not the focus Allow more time to remember or provide recognition tasks (e.g. is it true that...?) Attach daily schedules/timetables to notebook covers Explicitly teach students ways to create study guides and take notes with scaffolded support to enhance recall and memory Break tasks into chunks/segments to ensure student remembers what to do for each segment of a large project Use visuals, mapping strategies and prompts to cue recall Communicate frequently with parents through communication book or email 	<h2>Instructional Strategies</h2>		<ul style="list-style-type: none"> Provide direct instruction of executive functions and tools to support learning (e.g. student self-assessment, checklists, monitoring and planning sheets) Give time each day/week to organize materials and desk and provide direct support (e.g. review and complete checklist) Provide course outlines and organizers in advance Give outline/notes ahead of time of information to be covered in class Maintain a list of student contacts or have an on-line resource student can check for homework assistance Teach student how to develop timelines and to budget time Teach the student how to develop a work plan to get started and reinforce them for doing so Model and teach student how to break down assignments/projects into smaller steps Provide frequent descriptive feedback at critical points in the learning Foster planning and organization skills, monitor assignments closely, break down long-term assignments into smaller steps and check student's progress regularly Teach student to make "to-do" lists Teach the student to use self-regulation strategies (e.g. "stop and think") Use a "2-minute warning" or timer Use the student's strengths and interests to develop a daily plan Provide advanced preparations for changes in environment or routines Provide learning goals and success criteria
<ul style="list-style-type: none"> Provide visual cues (e.g. picture prompts) Display anchor charts (e.g. post key concepts) to cue memory 	<h2>Environmental Strategies</h2>		<ul style="list-style-type: none"> Preferential locker location to help with organization and retrieval of items Preferential seating to optimize ability to monitor work Provide the option of a carrel around the desk Provide individual work space if requested or considered necessary Post visual cues/reminders, learning goals and success criteria Use picture prompts posted in the room or taped on the student's desk Use a countdown timer set to ring when the time for the task is up
<ul style="list-style-type: none"> Allow for additional time to complete assessments to ensure opportunity for recall Reduce the working memory demands on tests by providing a structure and outline for responding (e.g. fill in the blank, true or false) Check for understanding of the concepts, rather than rote recall of facts and figures Provide opportunity for oral testing to allow prompts and decrease working memory demands Provide opportunity for more frequent, smaller assessments instead of large unit test 	<h2>Assessment Strategies</h2>		<ul style="list-style-type: none"> Provide oral prompts for the student to begin work in tests and exams Permit the student to use a cueing system, visual or auditory, to monitor performance Provide checklists Break large projects into small tasks with clear timelines Divide the test into parts and give it to the student one section at a time or over a period of days Adapt the assessment (e.g. project, culminating activity, test, exam) to accommodate the student's executive function needs Structure opportunity for the student to plan, organize, sequence individual parts of the task, to facilitate successful overall completion
<h2>Possible Assistive Technology (Based on individual student needs, SEA guidelines apply)</h2>			
<p>Text to Speech/ Optical Character Recognition: Drag and drop information from text to word document to create study notes</p> <p>Use Kurzweil virtual printer to convert activity sheet into readable document</p>	<p>Word Prediction: Support cognitive load, increase comprehension by removing need to decode information</p> <p>Speech to Text Record students answers for writing fluency</p> <p>Text to Speech Read assignments or test questions to support reading fluency</p>	<p>Speech to Text Software converts spoken word to written</p> <p>Text to Speech/ Optical Character Recognition Ability to drag and drop online information Organize main ideas and/or create study notes</p> <p>Graphic Organizer: Key information displayed in alternative format to help structure thinking and planning</p>	<p>Text to Speech/ Optical Character Recognition Kurzweil highlight feature to summarize text, or concept Provide recorded prompts</p> <p>Graphic Organizer Smart Ideas to organize ideas</p>