

Addressing the  
Needs of Students  
with

*Learning  
Disabilities*





Addressing the  
Needs of Students  
with *Learning  
Disabilities*

A blue circular logo with the text "Supporting Inclusive SCHOOLS" inside. "Supporting" is in a small, white, sans-serif font at the top. "Inclusive" is in a large, bold, white, sans-serif font in the middle. "SCHOOLS" is in a smaller, bold, white, sans-serif font at the bottom.

Manitoba Education and Advanced Learning Cataloguing in Publication Data

Supporting inclusive schools : addressing the needs of students  
with learning disabilities

Includes bibliographical references.

ISBN: 978-0-7711-7314-1 (pdf)

1. Inclusive education.
  2. Learning disabled children—Education.
  3. Learning disabled teenagers—Education.
  4. Learning disabilities—Study and teaching.
  5. Deaf children—Education—Manitoba.
  6. Hearing impaired—Education—Manitoba.
- I. Manitoba. Manitoba Education and Advanced Learning.  
371.9

Manitoba Education and Advanced Learning  
School Programs Division  
Winnipeg, Manitoba, Canada

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This resource is also available on the Manitoba Education and Advanced Learning website at [www.edu.gov.mb.ca/k12/specedu/documents.html](http://www.edu.gov.mb.ca/k12/specedu/documents.html).

Available in alternate formats upon request.

*Disponible en français.*

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# Introduction

Students with learning disabilities have diverse, complex, and interrelated difficulties, often hidden or subtle, that affect their learning. While there is great variability among students with learning disabilities, they are generally described as individuals of at least average intelligence who have difficulty processing information and who experience unexpected academic difficulties that cannot be explained on the basis of other diagnosed disabilities or environmental influences. These students exhibit strength and success in other learning and processing areas. Although learning disabilities are lifelong, their impact on quality of life can vary depending on demands in the environment.

Programming for students with learning disabilities is a dynamic, interactive process that requires problem-solving and teamwork among educators, students, and parents.

Adapted from: Alberta Learning. *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities*. Edmonton, Alberta: Alberta Learning, 2002. <https://archive.education.alberta.ca/>.

The eight modules in this resource are intended to support educators as they work with students with learning disabilities within inclusive classrooms and schools.



**Module 1: Understanding Learning Disabilities** contains information about the definition and diagnosis of learning disabilities.



**Module 2: Addressing the Needs of Students with Learning Disabilities** contains information about the ways in which learning disabilities are expressed in the classroom and the role of the classroom teacher in the identification and assessment of students who experience learning difficulties. This module further contains information about evidence-based teaching practises that support learning for all students, including those with learning disabilities. Also included is information about adaptations, assistive technologies, and instructional strategies (more specifically direct instruction, strategy instruction, and rehearsal and practice), which are essential to support students with learning disabilities.



**Module 3: Supporting Students with Reading Disabilities** contains information about reading disabilities and the ways in which educators can support students with reading disabilities.



**Module 4: Supporting Students with Learning Disabilities in Written Expression** contains information about writing disabilities and the ways in which educators can support students with writing disabilities.



**Module 5: Supporting Students with Mathematics Disabilities** contains information about mathematics disabilities and the ways in which educators can support students with mathematics disabilities.



**Module 6: Supporting Students with Nonverbal Learning Disabilities** contains information about nonverbal learning disabilities and the ways in which educators can support students with nonverbal learning disabilities.



**Module 7: Supporting Self-Advocacy and Success in Student Learning** contains information about strategies that can be used to support students with learning disabilities in advocating for themselves. A list of resources and associations related to advocacy is also included.



**Module 8: Supporting Student Transition from School to Post-Secondary Education and Employment** contains information about the transition planning process for students with learning disabilities.



# Module 1

Understanding  
*Learning  
Disabilities*



Students with learning disabilities have average to above average intelligence and potential but experience difficulty processing information that affects learning. Although they may experience unexpected academic underachievement compared to their intellectual ability, they can still experience academic success.

Learning disabilities affect the cognitive processes related to learning and are thought to be due to variations in brain structure and function. The learning difficulties experienced cannot be explained on the basis of other diagnosed disabilities or environmental influences.

Learning disabilities are complex. They can occur in many different areas of cognitive processing and along a spectrum of severity. As well, they vary greatly in terms of what functions they impact and to what degree that impact is felt by the student.

Unlike many other disabilities, learning disabilities are often less obvious and more difficult to identify. A learning disability, unlike a physical disability, cannot be seen. Students with learning disabilities may show no signs of difficulty except in a particular area of cognitive processing. It might not be obvious that a student's learning difficulties stem from a learning disability.

Early identification and intervention are keys to success; although success does not mean the disability disappears. Instead, the student effectively uses strengths and compensatory strategies to reach both academic and personal goals.

## ● Key Ideas in this Module

- Definition of a learning disability
- Diagnostic criteria
- Co-morbidity
- Academic skill deficits and cognitive processing deficits

## ● Definition of a Learning Disability

According to the Learning Disabilities Association of Canada (LDAC), learning disabilities refer to a number of disorders, which may affect the acquisition, organization, retention, understanding, or use of verbal or non-verbal information including:

- oral language (e.g., listening, speaking, understanding);
- reading (e.g., decoding, phonetic knowledge, word recognition, comprehension);
- written language (e.g., spelling and written expression);
- mathematics (e.g., computation, problem solving);
- social skills (e.g., social perception, social interaction, perspective taking);
- organizational abilities.

Learning disabilities are suggested by unexpected academic under-achievement, or achievement which is maintained only by unusually high levels of effort and support given a student's age, schooling, and level of intelligence. This learning difficulty cannot be explained on the basis of other diagnosed disabilities or environmental influences.

Learning disabilities are different from global intellectual deficits. Students with learning disabilities have average or above average intellectual ability. They experience difficulty as a result of impairments in one or more processes related to the following:

- perceiving;
- thinking;
- remembering;
- learning.

These difficulties include, but are not limited to the following:

- language processing;
- phonological processing;
- visual spatial processing;
- processing speed;
- memory and attention;
- executive functions (e.g., planning and decision making).

Learning disabilities range in severity (i.e., mild, moderate, severe).

Although the following factors may further complicate the challenges faced by individuals with learning disabilities, such disabilities are not due primarily to:

- hearing and/or vision problems;
- socio-economic factors;
- cultural or linguistic differences;
- lack of motivation;
- ineffective teaching.

Adapted from: Learning Disabilities Association of Canada.

[www.ldac-acta.ca/learn-more/ld-defined](http://www.ldac-acta.ca/learn-more/ld-defined).

## ● Diagnostic Criteria

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association, 2013), does not include the term 'learning disability'. Instead, it includes 'specific learning disorder' and lists it under the category of 'neurodevelopmental disorders' in order to emphasize the lifelong nature of these disorders. There are four main diagnostic criteria for a specific learning disorder.

1. The student experiences difficulty learning and using academic skills in specific areas such as decoding words, reading comprehension, spelling, written expression, or mathematics skills for at least 6 months despite the provision of interventions that target those difficulties.
2. The student's level of specific academic skill is substantially below what would be expected given the student's chronological age. This significantly interferes with academic performance or other areas of daily living.
3. The learning difficulties began during school-age years.
4. The learning difficulties are not better accounted for by other individual factors such as the presence of an intellectual disability, inadequate exposure to academic instruction in the language of proficiency, psychosocial adversity, or other mental or neurological disorders.

Source: DSM-5, 2013, pp. 66-74.

## ● Co-morbidity

Comorbidity refers to the presence of more than one mental health diagnosis occurring in an individual at the same time. Learning disabilities may coexist with various conditions including the following:

- attention disorders;
- behaviour disorders;
- emotional disorders;
- sensory impairments;
- other medical conditions.

## ● Academic Skill Deficits and Cognitive Processing Deficits

The DSM-5 criteria for diagnosing a learning disorder no longer require that a standardized Intelligence Quotient (IQ) assessment be administered, unless intellectual disabilities or developmental delays are suspected. There is also no longer a requirement for the testing of cognitive processes.

In a recent position paper, where LDAC compared their learning disability definition with the criteria in the DSM-5, they indicate that although an assessment of intelligence and cognitive processing is no longer required for a learning disability diagnosis,

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"Both intellectual assessment and data concerning a range of psychological processes provide a more comprehensive profile of strengths and weaknesses of the individual with learning disabilities and are critical

elements of a comprehensive plan for individually targeted intervention and accommodation.” (LDAC, 2015. p.8)

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LDAC supports analyzing the underlying cognitive processes (e.g., phonological processing, language processing, memory, etc.), in order to gain better understanding and insight into academic learning difficulties (see [Appendix 1-A](#)).

## Summary

- Learning disabilities are thought to be caused by variations in brain structure and function that impact the basic psychological processes involved in learning.
- Learning disabilities are different from global intellectual deficits.
- Learning disabilities are lifelong.
- The DSM-V identifies four main diagnostic criteria for a specific learning disorder.
- Learning disabilities often occur with other disorders and they can be mild, moderate, or severe, making identification and diagnosis challenging.
- LDAC supports both intellectual assessment and an assessment of cognitive processes when diagnosing a learning disability.

## References

*American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition.* Arlington, VA: American Psychiatric Association, 2013.

Fiedorowicz, C., J. Craig, M. Phillips, A. Price, and G. Bullivant. “Position Paper. To Revise or Not To Revise: The Official LDAC Definition of Learning Disabilities Versus DSM-5 Criteria”. *Learning Disabilities Association of Canada*, 2015. [www.ldac-acta.ca/learn-more/ldac-position-papers](http://www.ldac-acta.ca/learn-more/ldac-position-papers).

# Appendix 1-A

## Linking Academic Skill Deficits and Cognitive Processing Deficits

Academic Skill Deficit	Core Cognitive Processes	Other Cognitive Processes
<b>Reading</b>		
Word recognition	Phonological awareness	Rapid naming Phonological memory
Reading fluency	Rapid naming Processing speed Orthographic processing	
Reading comprehension	Language <ul style="list-style-type: none"> <li>■ Vocabulary</li> <li>■ Morphology</li> <li>■ Syntax</li> </ul> Listening comprehension Working memory Higher order processes <ul style="list-style-type: none"> <li>■ Inferencing</li> <li>■ Prior knowledge</li> <li>■ Comprehension monitoring</li> <li>■ Story structure sensitivity</li> </ul>	
<b>Mathematics</b>		
Computation	Working memory Spatial processing Visual-spatial motor integration	Attention Processing speed
Word problems	Working memory Executive processes Language	
<b>Written Expression</b>		
Handwriting	Automaticity in retrieving and producing alphabet letters Orthographic coding Ability to form mental representations of written words Graphomotor planning for sequential finger movements	
Spelling	Phonological and orthographic coding (visual-motor integration) Vocabulary knowledge (Grades 1-3)	
Composition	Handwriting automaticity Orthographic coding Working memory	

Source: Fiedorowicz et al. 2015. p.18.

# Module 2



## *Addressing the Needs of Students* with Learning Disabilities

## ● Introduction

Programming for students with learning disabilities is a dynamic, interactive process that requires problem solving and teamwork among educators, students and parents. Programming requires an organizational structure and school culture that supports the ongoing implementation of a student-specific planning process. It also requires consistency across settings and grade levels.

The guiding principles of programming for students with learning disabilities are as follows:

- Programming must be based on a student's strengths and needs.
- Programming is an active process, which is continuously adjusted to meet a student's needs.
- Students with learning disabilities need to participate in the regular curriculum to the fullest extent possible.
- Many practices used to support students with learning disabilities will benefit all students.

## ● Key Ideas in this Module

- Students with learning disabilities have average to above average intelligence although they have difficulty with processes related to learning.
- Brain research shows that all students can learn, but may learn in different ways.
- Learning disabilities can range from mild to severe and express themselves in a variety of ways, which can make them difficult to identify.
- Learning disabilities can also be present with other conditions.
- Programming for students with learning disabilities, as well as the assessment of learning needs, is a collaborative process that begins with the student, parent(s), and classroom teacher.
- Students who continue to struggle with learning may require student-specific, school-division-based, or specialized assessment, which may or may not result in the diagnosis of a learning disability.
- Educators can use approaches such as universal design and differentiated instruction to address the learning needs of all students in the classroom.



- If some students continue to have difficulty meeting their learning outcomes, adaptations (including assistive technology) may be used to support their learning.
- Research shows that the most effective programming intervention for students with learning disabilities involves a combination of direct instruction, strategy instruction, and rehearsal and practice.
- Although there are many models of direct instruction of strategies, the one that is most strongly supported in current research is the Self-Regulated Strategy Development model (SRSD).

## ● What Does a Learning Disability Look Like in the Classroom?

- Students with learning disabilities have average to above average intelligence but fail to learn as easily as their peers. Learning disabilities occur when one or more of the neurological processes people use to learn and develop oral language, reading, writing, mathematics, social skills, executive functions, memory, and motor skills is/are not working properly. Learning disabilities can affect any or all aspects of a student's academic growth.
- There are some common behaviours that students with learning disabilities often display. These can easily be recognized by the classroom teacher as signs that a learning disability may exist. Some of these are outlined in the following table. The more of these behaviours a student displays, the higher the probability that one or more of the neurological processes required to acquire, organize, retain, and understand both verbal and non-verbal information is not functioning typically.
- In the Early Years, more of the signs indicating the possibility of a learning disability are related to oral language and motor skills while in the Senior Years, the greatest number of signs are related to executive functioning. This correlates with the major cognitive developmental stages of children and adolescents. In the Early Years, children's primary task is to develop language skills. In adolescence, the primary task is to develop the ability to plan, self-monitor, and execute actions (executive functioning abilities).

### EARLY YEARS: "The student may have difficulty with . . ."

Oral Language	Reading	Written Language	Math	Social Skills	Executive Functions	Memory	Motor Skills
Producing speech sounds and pronouncing words	Connecting spoken sounds with letters	Drawing or tracing	Counting and learning numbers	Socialization, interaction with peers	Recalling routines	Learning the names of colours, days of week, etc.	Using pencils, scissors, crayons
Communication delays	Learning the alphabet				Learning time concepts		Dressing self without assistance
Small vocabulary							Walking up and down stairs
Rhyming words							Coordination
Speaking in full sentences							Uneven motor skill development
Sound sequencing in words							
Responding to oral task demands							

### MIDDLE YEARS: "The student may have difficulty with . . ."

Oral Language	Reading	Written Language	Math	Social Skills	Executive Functions	Memory	Motor Skills
Automaticity in decoding	Basic reading skills	Writing letters and numbers	Computing math problems	Detecting and interpreting social cues	Monitoring and evaluating performance	Recalling newly learned information	Tight grip on pen or pencil
Learning new vocabulary	Learning the alphabet				Learning time concepts		Dressing self without assistance
Small vocabulary	Reading comprehension	Written expression	Calculation	Playing age-appropriate games	Organizing assignments	Lengthy instructions	Drawing or copying shapes
Retelling stories	Slow reading rate	Poor spelling		Peer rejection	Sequential planning	Slow recall of information	Team sports
Speaking in full sentences							Uneven motor skill development
Oral expression	Reading accurately			The rules of conversation	Self-regulation	Retrieving vocabulary	
Listening comprehension	Identifying main ideas in text				Following directions		

### SENIOR YEARS: “The student may have difficulty with . . .”

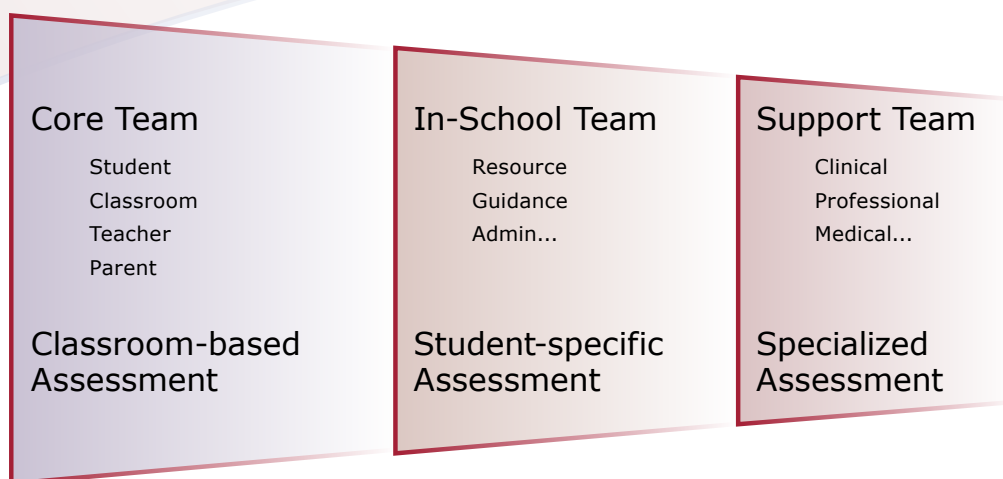
Oral Language	Reading	Written Language	Math	Social Skills	Executive Functions	Memory	Motor Skills
Expressing thoughts verbally	Reading comprehension	Expressing thoughts in writing	Abstract math concepts	Getting along with peers	Staying organized	Recalling newly learned information	
Using proper grammar when speaking		Writing with fluency	Math reasoning	Jokes that are subtle or sarcastic	Keeping track of time—self monitoring	Working memory	
		Grammar when writing		Making inappropriate remarks	Getting work done on time	Following directions	
				Reading social situations	Analyzing ideas		
					Multi-tasking		
					Problem solving		

The information included in the tables was taken from the following sources:

1. Learning Disabilities Association of Canada. [www.ldac-acta.ca/learn-more/research/ldac-research](http://www.ldac-acta.ca/learn-more/research/ldac-research).
2. Academic Resource Center Duke University Learning Disabilities. [http://arc.duke.edu/faculty\\_staff/ld\\_adhd\\_info/faculty\\_ld.php](http://arc.duke.edu/faculty_staff/ld_adhd_info/faculty_ld.php).
3. Teaching LD: Information & Resources for Teaching Students with Learning Disabilities. <http://teachingld.org/pages/basics>.
4. LD Online. [www.ldonline.org/article/How Do You Know If Your Child Might Have a Learning Disability%3F](http://www.ldonline.org/article/How_Do_You_Know_If_Your_Child_Might_Have_a_Learning_Disability%3F).
5. Morin, Amanda. Understanding executive functioning issues. <https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/understanding-executive-functioning-issues>.
6. Learning Disabilities Association of America. <http://ldaamerica.org/types-of-learning-disabilities/>.

## ● What Should I Do if I Suspect a Student in My Classroom Has a Learning Disability?

The diagnosis of a learning disability can only be made by a qualified mental health practitioner with education and experience in diagnosing learning disabilities; however, classroom supports and interventions can begin as soon as educators observe that a student is struggling with learning tasks.



The identification of a learning disability can be a complex process given the unique nature of each individual's learning strengths and challenges. The process of diagnosis can be further complicated if a student's learning has been affected by environmental factors (e.g., poverty, lack of school experience, etc.), or if the student struggles with one or more other diagnosis (e.g., attention disorders, sensory impairments). See Module 1: [Definition of a Learning Disability](#).

The classroom teacher plays a critical role in the identification of learning needs. It begins with gathering assessment data through classroom-based assessment processes. According to the *Appropriate Educational Programming in Manitoba: Standards for Student Services*, teachers use assessment to determine how students are progressing and to guide and improve instruction for all students. Student assessment may take the form of teacher observation, portfolios, outcome rubrics, classroom testing, and provincial assessments. See [Appendix 2-A](#) and [Appendix 2-B](#).

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In accordance with *The Amendment to the Public Schools Act*, Manitoba school divisions have an obligation to conduct regular assessments of student learning and to report to parents at the regular reporting periods.

Teachers use assessment to determine how students are progressing and to guide and improve instruction for all students. Student assessment may take from the teacher observation, portfolios, outcome rubrics, classroom testing, and provincial assessments. For some students, where indicated, specialized assessments may be needed. Assessment methods should be appropriate for and compatible with the purpose and context of the assessment.

Source: Manitoba Education, Citizenship and Youth. 2006. p.13.

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When used in the context of a collaborative tool for planning, assessment is a powerful way to enhance student learning. Formative assessment practices that include task analysis and error analysis provide valuable information for instructional planning and support.

Assessment should not be an end in itself, but part of a process which teachers can use to identify and address learning gaps, as well as to continually support student learning. If a student is having difficulty achieving learning outcomes, teachers should not only try new instructional approaches, they should give the student additional opportunities to succeed.

It is important to keep in mind that there are various types of assessments and each should be used according to its intended purpose.

- **Assessment for learning**, or formative assessment, is used to make visible the knowledge and understanding of each student. Assessment for learning is ongoing and helps educators decide how to help students progress. Educators use this style of assessment as an investigative tool to discover what their students know and are able to do, and whether there are any preconceptions, confusions, or gaps in their knowledge. Examples of formative assessment tools include observations, checklists, writing samples, and running records.
- **Assessment of learning**, or summative assessment, is used to confirm what students know and to demonstrate whether students have met curricular outcomes or student-specific outcomes, or to certify proficiency. Summative assessment includes anything for which students receive a grade or mark, such as projects, tests, exams, final drafts of written work, and so forth. It is generally used for reporting purposes.
- **Assessment as learning** is used by students to develop their skills of metacognition (i.e., their ability to understand their own thought processes). Assessment as learning comes from the idea that learning is not just a matter of transferring ideas from someone who is knowledgeable to someone who is not. Rather, learning is an active process of cognitive restructuring that occurs when individuals interact with new ideas.

There are many ways to look at the consequences of a learning disability, but the best way for educators to support learning needs is to look for ways to help students succeed.

If a student struggles with a learning task but has average to above average cognitive abilities, a teacher can ask: "How can I enable this student to show what he/she truly understands?"

If a student has processing difficulties, a teacher can ask: "How can I reduce the negative impact of this student's processing difficulties in instructional and assessment contexts?"

If a student has below average academic achievement, a teacher can ask: "How can I continue to develop this student's basic academic skills?" or "How can I accommodate this student's academic skills to ensure his or her fullest access to the curriculum?"

If a student has unexpected academic underachievement, a teacher can ask: "How can I make adjustments to instruction and assessment to help this student achieve the intended learning outcomes without excessive effort on the part of the student, or excessive support from adults?"

Adapted from: Ministry of Education. 2009. p.7.

For additional information on assessment, see *Rethinking Classroom Assessment with Purpose in Mind* at [www.edu.gov.mb.ca/k12/assess/wncp/](http://www.edu.gov.mb.ca/k12/assess/wncp/).

## ● Supporting Student Learning through Collaboration

No single individual can gather all of the information necessary to identify, understand, and plan for a student with a learning disability. Planning for a student with specific learning needs is a collaborative effort that involves a core team: parent(s), educators, and student. If learning difficulties persist, the team may be expanded to include other members of the school staff as well as clinicians and/or consultants.

Each member of the core team (parent(s), educators, and student) contributes information to the student profile, based on their interactions with and knowledge of the student. These multiple perspectives provide insight into the unique learning needs of the student. The team determines how much they know about the student's specific learning needs, what they still need to know, and how to fill in gaps that exist in their knowledge. Once they have gathered enough information, they are ready to begin selecting strategies, interventions, and adaptations that best support the student's learning.

## ● Supporting Student Learning

Based on Manitoba's Philosophy of Inclusion at [www.edu.gov.mb.ca/k12/specedu/aep/inclusion.html](http://www.edu.gov.mb.ca/k12/specedu/aep/inclusion.html), students with special learning needs, such as those with learning disabilities, should experience school as much as possible like their peers.

To make inclusion applicable in Manitoba schools, educators:

- Foster school and classroom communities where all students, including those with diverse needs and abilities, have a sense of personal belonging and achievement.
- Engage in practices that allow students with a wide range of learning needs to be taught together effectively.
- Enhance students' abilities to deal with diversity.

Universal design, differentiated instruction and the use of adaptations are some of the concepts that teachers use to achieve these ends.

## ● Universal Design

Universal design is the process of creating systems, environments, materials, and devices that are directly and repeatedly usable by people with the widest range of abilities operating within the largest variety of situations.

Source: Manitoba Education, Citizenship and Youth. 2006. p.13.

Planning from a universal design perspective begins with getting to know students in the classroom through the development of a class profile. A class profile is based on information gathered about students' learning styles, multiple intelligences, interests,

strengths, and needs. The class profile can help educators strive to eliminate learning barriers and build flexibility into course plans so that classroom instruction is usable by all students. When educators use universal design as a starting point for planning, there is less ongoing need to adjust lessons for individual students; this saves time for teachers and helps them meet the needs of all students in the classroom.

The democratic principles of non-discrimination and equal opportunity make universal design fundamentally inclusive. Universal design promotes accessibility to curricular content that gives all students equal opportunities to learn. Instructional planning based on universal design principles gives diverse learners multiple options for

- acquiring information and knowledge (multiple means of representation)
- demonstrating what they know (multiple means of action and expression)
- being motivated, challenged, and interested (multiple means of engagement)

Source: Manitoba Education, Citizenship and Youth. 2006. p.13.

### For more information on universal design, see

- <http://cast.org/index.html>
- <http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/>

### For information on creating class profiles, see

- Manitoba Education and Advanced Learning. *Supporting Inclusive Schools: A Handbook for Resource Teachers in Manitoba Schools*. Winnipeg, Manitoba: Manitoba Education and Advanced Learning, 2014. pp. 15-16, 81. [www.edu.gov.mb.ca/k12/specedu/res\\_teacher/](http://www.edu.gov.mb.ca/k12/specedu/res_teacher/).
- **Class Profile of Listening and Speaking Competencies** (Manitoba Education, Citizenship and Youth. *Listening and Speaking: First Steps into Literacy*. Winnipeg, Manitoba: Manitoba Education, Citizenship and Youth, 2008. 87. [www.edu.gov.mb.ca/k12/cur/ela/list\\_speak/listening\\_speaking.pdf](http://www.edu.gov.mb.ca/k12/cur/ela/list_speak/listening_speaking.pdf)).
- **Class Learning Profile** (Rose et al. *Teaching Every Student in the Digital Age: Universal Design for Learning. Class Learning Profile*. 2002. [www.cast.org/learningtools/index.html](http://www.cast.org/learningtools/index.html)).

## ● Differentiated Instruction

Differentiated instruction is a method of instruction and assessment that alters the presentation of the curriculum for the purpose of responding to learner diversity, as well as interests and strengths of students.

Source: Manitoba Education, Citizenship and Youth. 2006.

## Differentiated instruction:

- is instruction that acknowledges and responds to diversity among learners;
- refers to the wide range of instructional strategies, techniques, and approaches that can be used to support student learning and to help each student achieve high expectations;
- offers students multiple options at each stage of the learning process;
- recognizes that there are many avenues to reach student learning outcomes and that each student requires a complex and unique mix of basic instruction and practice to reach his or her potential;
- is concerned with establishing a supportive learning environment for all students and with meeting each student's learning requirements.

*Success for All Learners*, pp. 1.5, 12.4

Compatible with the principles of universal design, differentiated instruction takes into account each student's learning preferences, learning styles, and multiple intelligences. Educators can use information gathered in the class profile to differentiate instruction in the following five areas:

1. **Content:** What is taught and how access to relevant information and ideas is provided.
2. **Process:** How a teacher selects activities and processes that help students understand and "own" the knowledge, skills, and understanding essential to a topic/outcome.
3. **Product:** How a student demonstrates what he or she has come to know, understand, and do.
4. **Affect:** How a student links thought and feeling in the classroom. (The way in which a student attaches emotional significance to information can have a strong impact on learning.)
5. **Learning Environment:** How the classroom "feels" and functions.

### Sources:

Tomlinson, Carol A. and Cindy A. Strickland. [Differentiation in practice : \[book\] a resource guide for differentiating curriculum, grades 9-12](#). Alexandria, VA: Association for Supervision and Curriculum Development. 2005.

Tomlinson, Carol A. and Cindy A. Strickland. [Differentiation in practice : \[book\] a resource guide for differentiating curriculum, grades 5-9](#). Alexandria, VA: Association for Supervision and Curriculum Development. 2003.

Tomlinson, Carol A. and Cindy A. Strickland. [Differentiation in practice : \[book\] a resource guide for differentiating curriculum, grades K-5](#). Alexandria, VA: Association for Supervision and Curriculum Development. 2003.

Baynes, K. Eliassen, J.C., Lutstep, H.L., & Gazzinga, M.S. *Modular organization of cognitive systems masked by interhemispheric integration*. *Science*, 280 (5365), 902-905.

For more information, see

- Manitoba Education and Training. *Success for All Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*. Winnipeg, MB: Manitoba Education and Training, 1996.



- Manitoba Education. *Towards Inclusion: Supporting Positive Behaviour in Manitoba Classrooms*. Winnipeg, Manitoba: Manitoba Education, 2011. [www.edu.gov.mb.ca/k12/specedu/behaviour/index.html](http://www.edu.gov.mb.ca/k12/specedu/behaviour/index.html).
- Center for Applied Special Technology (CAST) website, *Teaching Every Student has a Universal Design for Learning (UDL) Class Profile Maker*, which includes a tutorial. [www.cast.org/learningtools/index.html](http://www.cast.org/learningtools/index.html).
- *Learning in Safe Schools: Creating classrooms where all students belong*. (Brownlie and King, 2009): Pembroke Publishers.
- For more information on the connection between emotion and learning see the online interview with neuroscientist Joseph Ledoux at [www.edge.org/3rd\\_culture/ledoux/ledoux\\_pl.html](http://www.edge.org/3rd_culture/ledoux/ledoux_pl.html).

## ● Adaptations

An adaptation is a change in the teaching process, materials, assignments, or student products to assist a pupil in achieving the expected learning outcomes. (*The Public Schools Act Amendment (Appropriate Educational Programming) Regulation 155/2005*)

The use of adaptations is compatible with the inclusive philosophy of universal design and the principles of differentiated instruction. In many cases, the use of adaptations involves good teaching practices that benefit and can be available to all students.

The Manitoba Human Rights Code requires reasonable accommodation for students to meet their curricular outcomes. Adaptations are fair and, as such, they do not give students an unfair advantage over students who are not using adaptations. Adaptations help students achieve expected learning outcomes. A student can use adaptations throughout their school years, from elementary school through post-secondary education.

### Adaptations are most effective when educators

- **Understand the purpose:** Adaptations do not give students with learning difficulties an unfair advantage over other students, nor do adaptations replace the need for developing basic skills. Adaptations compensate for students' learning challenges and give them the same opportunities to learn as other students.
- **Select appropriate adaptations:** It is important to select adaptations based on the unique needs of the student that have been identified in the student profile, rather than rely on the most obvious or commonly used adaptations.
- **Use adaptations consistently:** Students need time to adjust to adaptations and learn to use them effectively. Students need to use the adaptation regularly in order for a teacher to know if it is benefitting the student.

- **Involve students:** Research shows that when students are involved in selecting adaptations they are less self-conscious about using them. Even if an adaptation seems ideal for a student it may not be successful if the student is resistant.

Many examples of adaptations that support students with learning disabilities are included in Modules 2 through 5. For examples of common adaptations, see the Maple site at [www.mapleforem.ca/pg/resource/20373/download%20](http://www.mapleforem.ca/pg/resource/20373/download%20). It includes SJASD/RETSD adaptations spreadsheets. Further examples are available at: Ministry of Education. *Teachers Make the Difference: Teaching Students with Learning Disabilities at Middle and Secondary Levels*. Saskatchewan, Canada: Ministry of Education, 2009. pp 41-66. [www.education.gov.sk.ca/Teachers-Make-the-Difference](http://www.education.gov.sk.ca/Teachers-Make-the-Difference).

Adaptations are permitted for Provincial Tests

### 3.3 Adaptations to provincial tests.

Manitoba Education and Advanced Learning is committed to equity of opportunity and fairness to students. Every reasonable effort is made to enable students to demonstrate learning in relation to the learning outcomes set out in the curriculum documents in the subject area that is being assessed.

Adaptations requested should parallel, as much as possible, any school adaptations that are used on an ongoing basis to assist the student during instruction and assessment activities provided that such adaptations do not jeopardize the validity of the test or create inequities in test administration procedures. Requests are treated confidentially. More than one adaptation may be requested for a student.

All adaptation requests made on behalf of a student must be made with the full knowledge of parents/legal guardians or the student if he/she has reached the age of majority.

Further information is available at: [www.edu.gov.mb.ca/k12/assess/docs/pol\\_proc/](http://www.edu.gov.mb.ca/k12/assess/docs/pol_proc/).

## ● Compensation versus Skill Development

One of the challenges in supporting students with a diagnosed learning disability is finding the right balance between providing direct instruction to improve areas of weakness and providing adaptations to compensate for the identified learning difficulties. It is important that members of the school support team recognize the difference between these two kinds of support.

When students are in the early years, the focus is on continuing to provide direct instruction in order to help children acquire the skills and strategies they are missing. This is appropriate since all children in the early years are working to acquire basic literacy and math skills.

As students approach the middle years, the balance begins to shift such that direct instruction continues to be provided, but to a lesser degree, while the student is offered appropriate adaptations in order to compensate for their skill deficits so that they can keep up with the content learning, along with their peers.

As students approach their high school years, the balance shifts even further toward adaptations and away from specific skill development as students depend on adaptations to keep pace with the learning requirements of the curriculum content at that level.

For example, if a student in Grade 6 is reading independently at an early years' level but has good auditory comprehension, educators may support the student by:

- continuing to teach phonics and other reading strategies to improve independent reading skills;
- instructing the student in the use of assistive technology (AT) to compensate for the reading difficulties and help the student maintain a reasonable learning pace in all subject areas.

By Grade 10, the same student will need to focus almost all of his/her energy on mastering the use of adaptations, including AT, in order to obtain course credits toward graduation. At this stage, consideration would also be given to planning for transition to adulthood, and identifying the adaptations and AT the student will need when they leave high school.

Members of the student-support team, including the student and parent(s), need a good understanding of the reasons behind the decisions they make regarding how to support a student effectively at various points in his/her school career.

It is important that any adaptations or specific skill instruction deemed essential for student success are documented in an IEP that can follow the student to other classes and grade levels.

#### **For more information**

Manitoba Education. "Appendix J: IEP Framework for Documenting Adaptations (Sample Form)." *Manitoba Education Document: Student Specific Planning: A Handbook for Developing and Implementing Individual Education Plans (IEPs)*. Winnipeg, Manitoba: Manitoba Education, 2010. 76. [www.edu.gov.mb.ca/k12/specedu/programming/iep.html](http://www.edu.gov.mb.ca/k12/specedu/programming/iep.html).

## **Assistive Technology**

Assistive Technology (AT) is a term that refers to any piece of equipment or software that can be used to increase a student's efficiency with learning, to maintain function or to improve capability. AT is one of many possible adaptations that can be used to support student learning.

The selection of appropriate AT should be based on a student's individual strengths and needs, and the implementation of AT should be accompanied by quality instruction. Depending on a student's learning needs AT can be as simple as a sticky note or as complex as a talking word processor. Some examples of AT solutions that range from low to high tech include the following:

#### **Low-technology solutions include:**

- raised line paper;
- alternative writing surfaces;

- alternative writing instruments (e.g., magnetic letters, alphabet stamps, etc.);
- materials to support memory, focus, and organization (e.g., sticky notes, highlighters, graphic organizers such as mind maps/webs or concept frames).

### Mid-technology solutions include:

- digital recorders;
- calculators;
- talking spell-checkers;
- audio books;
- word processors;
- simple voice playback devices.

### High-technology solutions include:

- specialized software such as:
  - Talking word processors;
  - Word prediction software;
  - Screen reading software;
  - Scan and read software.
- communication devices;
- specialized computer access such as:
  - Touch screens;
  - Alternative keyboards;
  - Switch adapted mice;
  - Braille display.

For more information about the use of AT to support specific learning disabilities, see Modules 2 through 5.

Alternative format materials (e.g., audio books, Braille, large print, electronic text) are available through Alternate Format Services (AFS) of the Manitoba Education Library. Materials must be ordered in connection with a specific student, but can be used universally (by any student in any way appropriate). Students with visual impairments must be assessed by a Manitoba Education and Advanced Learning Consultant for the Blind and Visually Impaired in order to access these resources. Students with other print disabilities (e.g., a learning disability) may access these resources through a resource teacher or classroom teacher.

Instructional Resources Unit  
Main Floor, 1181 Portage Avenue  
Winnipeg MB R3G 0T3

Website:

[www.edu.gov.mb.ca/k12/mel/index.html](http://www.edu.gov.mb.ca/k12/mel/index.html) (Select the Alternate Format Services icon.)

Reference Assistance: 1-800-282-7830

Alternative Formats Collection (AFC): 1-800-282-7835

Email: [iruafc@gov.mb.ca](mailto:iruafc@gov.mb.ca)

Student Services

Assistive Technology and Support

[www.edu.gov.mb.ca/k12/specedu/programming/technology.html](http://www.edu.gov.mb.ca/k12/specedu/programming/technology.html)

Program and Student Services

Telephone: 204-945-7907

Toll Free in Manitoba: 1-800-282-8069, ext. 7907

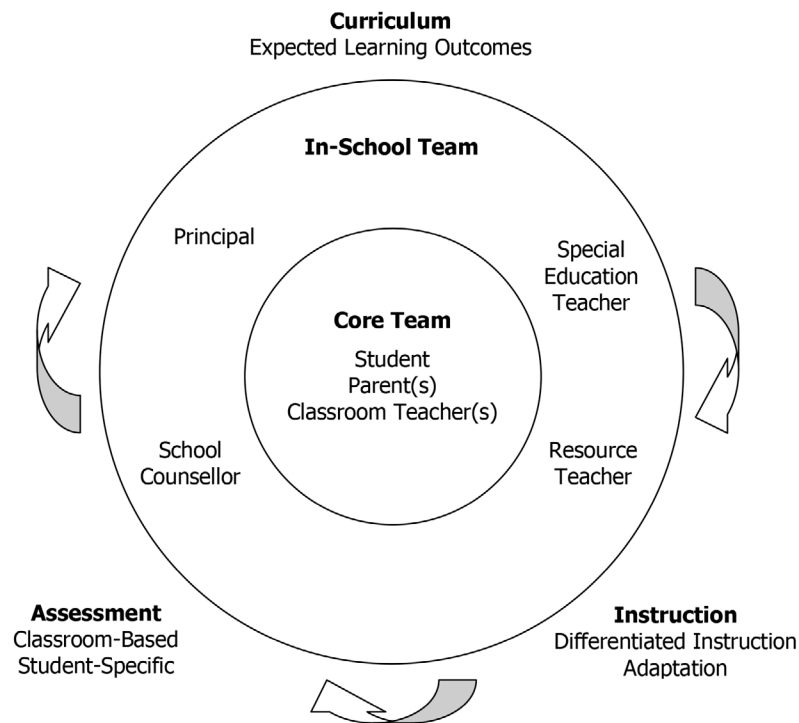
Email: [pssbinfo@gov.mb.ca](mailto:pssbinfo@gov.mb.ca)

## ● Student-Specific Assessment

When teachers plan from a universal design perspective their goal is to address the learning styles and needs of all students. In some cases though, a student will continue to experience learning difficulties despite the teacher's efforts. The teacher then uses classroom based assessment to identify this student's learning needs and work with the student and their parent(s) to address these needs through differentiated instruction and the use of adaptations. The useful adaptations would be documented in an IEP. This process is known as student-specific planning. If the student continues to experience learning difficulties, the teacher then moves on to the next stage of student-specific planning; this involves expanding the team to include school personnel, such as a resource teacher, for further support and assessment.

Figure 1

## The In-School Team



Source: Manitoba Education. 2010. p.11.

Student-specific assessment is a process in which the resource teacher, or another appropriate member of the in-school team, works with the classroom teacher to:

- review classroom/curriculum based illustrative work samples;
- review the student support file;
- review any additional data collected by the classroom teacher;
- observe the student in the classroom environment in order to collect further information about the student's learning strengths and needs;
- make decisions about further assessment.

The resource teacher and classroom teacher may decide that further assessments are required to determine the next steps in the planning process. The resource teacher may administer those assessments.

If no further assessments are required the resource teacher may assist with the selection and implementation of further programming supports and interventions. At this stage in the process, the in-school team may decide to use the student-specific planning process to create or add to an individual education plan (IEP) for the student, in order to document further adaptations or remediation strategies.

**For more information see**

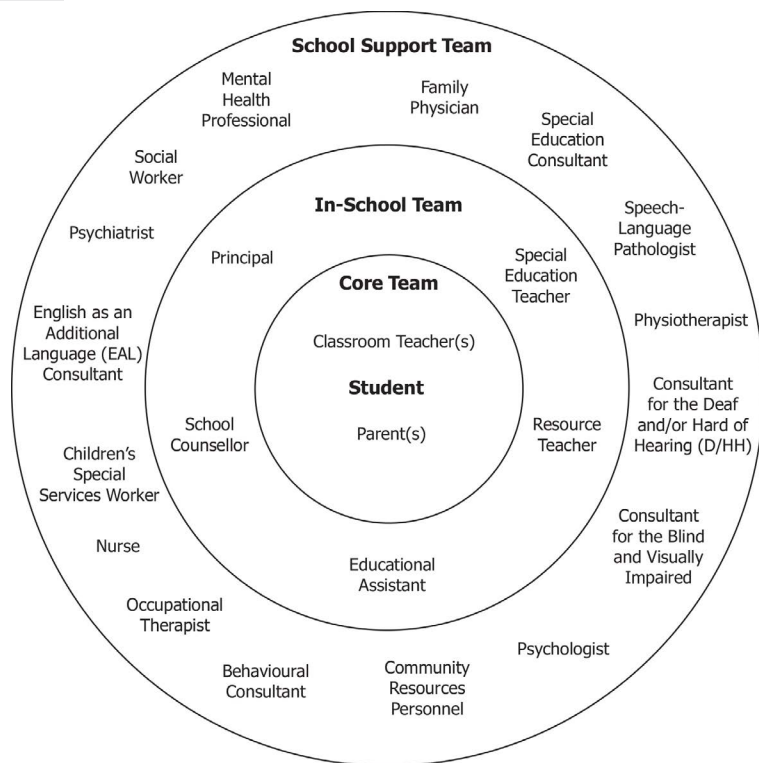
Manitoba Education. *Student-Specific Planning: A Handbook for Developing and Implementing Individual Education Plans (IEPs)*. Winnipeg, Manitoba: Manitoba Education, 2010. [www.edu.gov.mb.ca/k12/specedu/iep/pdf/planning/student\\_specific\\_planning.pdf](http://www.edu.gov.mb.ca/k12/specedu/iep/pdf/planning/student_specific_planning.pdf).

## ● Expanding the School-based Team and Specialized Assessment

If a student continues to have difficulty meeting learning outcomes, the classroom teacher, resource teacher, parent(s) and student may determine that expanding the team to include one or more school division clinicians or consultants would benefit the student. This may involve a pre-referral consultation with a clinician or consultant who may provide additional suggestions for programming supports and interventions. This consultation may or may not result in a referral or a specialized assessment. If the expanded team determines a need to access further expertise outside the school and school division, a process for this will be determined during a team meeting.

Figure 2

**Personnel on a Student Support Team (Sample)**



Source: Manitoba Education. 2010. p.33.

Specialized assessment is a formal process of referral initiated by the school team that requires parental consent if the student is under 18 years of age or the consent of the student if 18 and over. When the in-school team has made a decision that a specialized assessment is necessary, it is the responsibility of the school principal to ensure that the assessment takes place.

According to the *Standards for Student Services*, specialized assessments are conducted by qualified professionals on an individual basis to determine what factors are affecting a student's learning and what approaches could assist the student in meeting learning outcomes in the classroom.

Specialized assessment is a process in which appropriate professional(s) work with the school team to:

- review data collected by the classroom teacher and resource teacher;
- review the student support file(s);
- collect further information about student strengths and needs;
- recommend possible further assessments and/or a possible diagnosis.

A very small percentage of students with learning difficulties will require a specialized assessment and a small percentage of these assessments will result in the diagnosis of a learning disability.

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For some students, where indicated, specialized assessments may be needed. Assessment methods should be appropriate for and compatible with the purpose and context of the assessment.

Specialized assessments are conducted by qualified professionals on an individual basis to determine what factors are affecting the student's learning and what approaches would assist the student to meet the learning outcomes in the classroom.

A. School divisions shall:

1. use the information gathered by the classroom teacher as the first source of information regarding student learning (MR 155/05)
2. use assessment results to guide programming decisions for the student (MR 155/05)
3. ensure qualified professionals who are designated by the school board or the principal conduct specialized assessments, interpret results, follow principles of fair assessment practices and provide parents and classroom teachers with programming recommendations (MR 155/05)
4. use qualified professionals and other service providers and involve parents to complete specialized assessments when appropriate (MR 155/05)
5. ensure that school teams, including parents when possible, are responsible for developing student-specific outcomes where indicated by the assessment process (MR 155/05)

Source: Manitoba Education, Citizenship and Youth. 2006. p.13.

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Advantages to the diagnosis of a learning disability may include the following:

- explaining the reason for the student's underachievement and clarifying that it is not because the student is "lazy" or "just not trying";
- building the student's self-esteem as teachers, students, and parents begin to understand that the student has average or above average thinking and reasoning skills and is not "stupid";
- reinforcing teachers' and student's efforts towards advocacy for appropriate supports;
- providing information for programming that builds on the student's strengths while supporting his or her challenges with adaptations;
- supporting the transition to post-secondary opportunities (see Module 8 for further information).

## ● Supporting Learning Disabilities through Research-Based Instructional Practise

Research shows that the most effective programming intervention for all students, including students with learning disabilities, involves a combination of direct instruction, scaffolded instruction, strategy instruction, and rehearsal and practise. This section contains specific information about how these research-based instructional strategies can be applied to specific learning disabilities, including reading, written expression, mathematics, and nonverbal learning disabilities.

## ● Direct Instruction

Direct (or explicit) instruction involves modelling both the overt processes and the covert processes (or mental processes) that are necessary to successfully complete a task. Often covert processes are not adequately explained and students are left to infer the mental processes that take place. Many students with learning disabilities are not able to learn cognitive strategies without direct (explicit) instruction. (Larkin and Ellis, 1998) For example, if students are given the task of writing an essay they are required to apply a problem-solving process to complete a number of covert and overt steps. The process involved in selecting a topic may seem simple to a student when the teacher writes down a phrase or a sentence to describe the topic. This is overt or observable behaviour. The covert or cognitive process that the student does not see (unless the teacher demonstrates it) is the thought and self-talk involved with the process of selecting and rejecting possible topics until one is identified.

Some examples of cognitive strategies that involve covert processes include the following:

- creating visual imagery;
- paraphrasing;

- prioritizing ideas;
- generating hypotheses;
- relating new information to prior information.

Some examples of metacognitive strategies, which are required in order to understand the task, include the following:

- analyzing the task;
- making decisions about topic selection;
- setting goals;
- self-monitoring.

Source: Ministry of Education. 2009. p.16.

## ● Scaffolded Instruction

Scaffolded instruction is an instructional approach that enables teachers to provide highly explicit and organized instruction to individual students while supporting the transition from current skill or knowledge levels to more advanced levels. Scaffolded instruction, much like the scaffold of a building under construction, is a way of providing learning support until a skill has been solidly “built”.

Scaffolded instruction should be used as a temporary support when students are unable to complete a task on their own. The teacher assists students by modeling task completion, explicitly describing the covert thinking processes involved and providing verbal prompts when and if the student needs guidance. The teacher provides ongoing feedback as the student works at completing the task, constantly tailoring support to match the student’s ever-changing skill level. When the student can complete the task independently, the teacher’s support is removed.

Refer to [Gradual Release of Responsibility](#) section for further information.

## ● Strategy Instruction

Strategy instruction is a method of instruction that supports learning by teaching students how to organize information, make meaning of new information, and connect new information with what they already know. Strategies are not “add-ons” for engaging student interest: They are the tools students use to process ideas and information.

**Strategies are especially important for students with learning disabilities, as they can help students reduce cognitive load in working memory.** In other words, strategies can “free up” space in students’ brains for learning.

Strategies are best taught through direct instruction. Successful learning of these strategies requires a sufficient amount of support or scaffolding as well as student

engagement in the process. Many researchers believe that the active participation of students in the process of strategy instruction makes more difference in learning than the strategy itself.

Strategy instruction can help students develop the skills, behaviour, and attitudes they need for independent, lifelong learning. Strategy instruction is beneficial for students because it:

- teaches the behaviours of skilled learners;
- enhances metacognition (the ability to think about one's own thinking);
- increases responsibility for learning;
- promotes engagement in learning.

It is not possible to say that one strategy is more effective than another but research has shown that three particularly powerful strategies include the following:

- asking and answering questions;
- summarizing ideas;
- using graphic organizers.

Other examples of strategies that students can use to support and promote learning include the following:

- active listening;
- active thinking;
- writing to learn;
- paraphrasing;
- drawing inferences based on new information and prior knowledge;
- thinking about the types of questions they are being asked to answer.

Although there are many models of direct instruction of strategies, the one that is most strongly supported through evidence obtained through meta-analysis of current research is the Self-Regulated Strategy Development model (SRSD).

## ● Supporting Student Self-regulation through Metacognition

- Students with learning disabilities need to develop an awareness of what strategies are effective for them to use when learning.
- Students with learning disabilities have to believe they can learn using the skill sets that work for them.

Self-Regulated Strategy Development (SRSD) has been shown to have an especially strong impact (Graham & Harris 2005).

## ● The Self-Regulated Strategy Development Model

All students must receive direct instruction and practice to understand how a strategy works and why each step in the strategy is performed. Students with learning disabilities need extensive direct/explicit instruction, strategy instruction, and rehearsal and practice to build automaticity in their neuro-pathways. This allows the student quick and efficient access to the strategy in any subject area. Although there are many models, the one that is most strongly supported through evidence obtained through meta-analysis of current research is the Self-Regulated Strategy Development model (SRSD).

SRSD stresses the need to provide students with essential metacognitive knowledge of the strategies that are being taught. The SRSD model enables all students to understand the process of the strategy being taught in all content areas. It allows the student with learning disabilities the additional time and consistent process needed to strengthen the use of the strategy.

## ● The Six Stages of Self-regulated Strategy Development

The stages in SRSD are intended to be recursive and should be revisited to ensure mastery. The stages of implementation are set up to ensure that all necessary areas are fully addressed; however, because of the flexibility of this model, the stages may be reordered or combined as deemed appropriate or necessary by the teacher. Stages can and should be revisited as part of the instructional process. Revisiting stages will not only help with mastery, it will also allow students to rethink and develop metacognitive skills.

### Stage 1: Develop and Activate the Background Knowledge

Students with a learning disability may not have the background knowledge or prerequisite skills surrounding the use of a strategy. It is therefore essential to teach each step of the strategy. By the time the student with a learning disability enters middle years or high school, their knowledge may be fragmented.

Students must have mastered prerequisite skills to effectively use a strategy. The best way to identify the basic terms and skills necessary for the strategy is to do a task analysis. The task analysis will help teachers to determine whether or not students possess the prerequisite skills necessary to perform the strategy or where the gaps in the learning occur.

After the task analysis is complete there are many ways that teachers can assess students' skills. These include observing student performance, using curriculum-based measures, or simply asking students. Often, instructors will already possess knowledge of student pre-skills through formative assessment. Skill deficits should be addressed prior to introducing the new strategy.

"Task analysis for instructional design is a process of analyzing and articulating the kind of learning that you expect the learners to know how to perform" (Jonassen, Tessmer, & Hannum, 1999, p.3).

Video of task analysis  
<http://silo.hunter.cuny.edu/e8jdJbht>

## Stage 2: Discuss the Strategy

The students need to believe that the strategy that they are learning will allow them to be more successful as a learner. It will enable them to be more actively involved, which is the first step in self-regulation. Teachers need to be excited, committed, and energized to motivate the students on the use of the strategy because if a student does not understand the purpose and benefit of the strategy to them, it is fair to assume that they will not use the strategy.

During this stage it is appropriate for teachers to explain to students the benefits of using the strategy; discussing and even providing examples of current performance. Teachers should ask students questions and ask them how confident they feel in the particular subject or skill being discussed. Teachers should then explain how learning the strategy can improve their performance.

The final part of this stage is introducing students to the steps of the strategy. Strategy steps should be explained one-by-one. A student with a learning disability requires the steps in the strategy to be explicitly taught with time to process and time to practice each step independently until mastered.

Throughout this process, teachers should be monitoring their students' understanding. Part of this process is to work in cooperation with the students to ensure that students are keeping up with and understanding what is being explained, and are able to apply the strategy in more than one context.

## Stage 3: Model the Strategy

The purpose of modeling is to expose students to the thought processes of a skilled learner. Good modeling goes well beyond merely presenting the steps in a strategy. It provides students with the “why” and “how” of various strategy steps. It exposes students with a learning disability to all of the thought processes that are behind the why and how that other students intuitively recognize. Students with learning disabilities often do not know how to access or articulate their thinking and so believe that other students are smarter when the truth is that they are just as smart.

By modeling, a teacher can show not only what to do, but what to think as well. This process is called a ‘think-aloud’. A think-aloud goes beyond just listing the steps in a strategy. While listing is useful, it is insufficient. Students need to see the metacognitive (thinking) process involved in understanding and using the strategy. With the teacher expressing their thought processes while using the strategy, the student is able to see how a successful learner uses the strategy and thinks through it.

Think-alouds have been described as “eavesdropping on someone’s thinking.”

With this strategy, teachers verbalize aloud their thinking for any purpose. Their verbalizations include describing things they’re doing as they read to monitor their comprehension or write in any of the stages of the writing process; solve a math problem, etc.

The purpose of the think-aloud strategy is to model for students how skilled learners think. <http://libguides.rtc.edu/content.php?pid=104653&sid=787642>

The process of a think-aloud is much more complex than it may initially seem. For expert learners, making the covert overt is extremely difficult and requires a significant amount of practice and preparation.

## Stage 4: Memorize the Strategy

It is critical that students commit the strategy steps to memory so that they become automatic. Automaticity is essential because we want all students to be able to focus on the task and not on remembering the steps of the strategy. Students with learning disabilities may have a limited amount of cognitive processing capacity, and if that capacity is consumed with remembering the steps of the strategy it will be difficult or impossible to focus on the task itself.

Memorizing the strategy steps is something that we should not just work on once or twice; we need to be constantly reinforcing the memorization of the strategy steps in various contexts/content areas so that it becomes second nature to students. There are many ways to help students memorize the steps of a strategy; the key is repetition and variation. The more practice they get in a variety of settings and situations the more successful they will be at memorizing the strategy. Students need to know and understand what is involved with each step in the process. They should not just be parroting back the steps involved in the strategy. Using mnemonic memory devices often helps students recall the steps and memorize the strategy.

Scaffolding is an instructional technique whereby the teacher models the desired learning strategy or task, then gradually shifts responsibility to the students.

[www.ijhssnet.com/journals/Vol\\_1\\_No\\_18\\_Special\\_Issue/18.pdf](http://www.ijhssnet.com/journals/Vol_1_No_18_Special_Issue/18.pdf)

## Stage 5: Support the Strategy

Teachers need to support the learning of the strategy. Supporting the strategy can be done using a process called scaffolding. Scaffolding involves teachers initially performing all or most of a task, while increasingly shifting responsibility of performance to the student. With scaffolding, it is possible for a gradual release of responsibility from teacher to student. (For further information refer to the [Gradual Release of Responsibility](#) section. Students need adequate time for rehearsal and practice to master the strategy.

Collaboration between teachers and students is extremely important in the SRSD process. Collaboration provides the teacher with an opportunity to verify student understanding and fill in any necessary information the student may be lacking. It also provides another opportunity to ensure that students possess the skills necessary to complete the task successfully. In some cases, teachers may need to go back and teach some prerequisite skills. This is part of the flexibility of the SRSD model.

Supporting the strategy may include the following:

- Working collaboratively on tasks while gradually fading help;
- Putting students into small groups;

- Modelling the strategy repeatedly;
- Re-teaching some prerequisite skills;
- Prompting the particular use of a step;
- Providing corrective feedback;
- Supervising when the student is using the strategy independently.

## Stage 6: Independent Performance

It is important to remember that the goal of strategy instruction is not for the student to use the strategy explicitly as taught, **but for improved learner outcomes and for students with learning disabilities to see themselves as successful learners**. It may be necessary for students to adapt the strategy to meet their needs. This is an acceptable part of the model as long as the teacher is confident the strategy is still successful in completing the tasks and is working for the student.

Independent performance does not mean that a teacher’s job is done. Teachers must still monitor students’ use of the strategy to ensure they are using the strategy properly.

The information on SRSD was adapted with permission from the following article:

University of Nebraska—Lincoln. *Special Education and Communication Disorders*. “Teaching Strategies”. Lincoln, Nebraska: University of Nebraska—Lincoln, 2009. <http://cehs.unl.edu/csi/>. Used with permission. All rights reserved.

Students with learning disabilities have the same capacity to learn as their peers. Some students with learning disabilities see learning as an overwhelming task to be avoided, delayed, and embarked upon with little persistence. When given the skill sets to access strategies that enable them to be successful in their learning, they become actively involved in the education process and have better retention, motivation, and overall attitudes towards learning.

For more information on strategies, see

Manitoba Education and Training. *Success for All Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*. Winnipeg, MB: Manitoba Education and Training, 1996. (Available at the Manitoba Learning Resource Centre.)

See Modules 2 through 5 for practical examples of strategies.

## ● Rehearsal and Practice

There are a variety of programming interventions, strategies, and adaptations available to support student success in learning; however, research has revealed that the most effective intervention involves a combination of direct instruction, strategy instruction, and rehearsal and practice. Rehearsal and repetition—the practise of new information—

strengthens neural pathways in the brain and creates new ones, which is necessary for the retention of new information and essential to the process of learning.

Practise positively affects performance in all academic subject areas. There are many benefits of practise for all students, including an increased ability to:

- retain new information;
- achieve automaticity (the ability to apply knowledge automatically, without reflection) which frees up students' cognitive resources;
- transfer practised problem-solving skills to new and more complex problems and acquire expertise in subject matter, which helps students distinguish novices from experts;
- continue learning; cognitive gains from practise can create motivation for more learning.

Practise involves the repetition of specific skills or the review of smaller pieces of information to increase accuracy, speed and recall, and to make learning immediately accessible for cognitive use (Dean et al., p. 101). Practise should not be seen as rote repetition, but deliberate, goal-directed rehearsal combined with reflection on the process of problem-solving. For example, if students are practising the identification of phonemes, the ultimate goal is reading fluency and comprehension.

Practise is most effective for students when teachers:

- plan practise tasks with students' existing knowledge in mind (Success maximizes the benefits of practise while failure at a task can create frustration and inhibit motivation.);
- provide timely and descriptive feedback;
- provide repeated opportunities for practise by planning practise tasks that are similar to other practise tasks;
- provide opportunities for students to practise more than one skill at a time (e.g., rather than practise finding the radius of a circle given the circumference, students can practise finding the radius of the circle given the circumference as well as finding the circumference given the radius, and finding measurements of other shapes as well);
- provide frequent practise sessions (at least 2 to 3 times during the period between acquisition and final assessment) that actively involve student recall through quizzes, rehearsal, or self-assessment (e.g., flash cards, practise quizzes).

Adapted from: Brabeck, Mary, Jill Jeffrey, and Sara Fry.  
*Practice for Knowledge Acquisition (Not Drill and Kill)*.  
American Psychological Association. [www.apa.org/education/k12/practice-acquisition.aspx](http://www.apa.org/education/k12/practice-acquisition.aspx).

Practise doesn't always make perfect. If students practise a skill incorrectly they will ultimately have difficulty learning the correct way to perform that skill.



## ● Module Summary

Students with learning disabilities have average to above average intelligence but have difficulty with processes related to learning. Assessment and programming for students with learning disabilities is a collaborative process that begins with the student, parent(s), and classroom teacher. Educators can use approaches such as universal design and differentiated instruction to address the learning needs of all students in the classroom, and can support students through the use of adaptations including assistive technology. Students who continue to struggle with learning may require further assessment and support. The most effective programming intervention for students with learning disabilities involves a combination of direct instruction, strategy instruction, and rehearsal and practice. Although there are many models of direct instruction of strategies, the one that is most strongly supported through evidence is the Self-Regulated Strategy Development model (SRSD).

## ● References

- Alberta Education. *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities*, Edmonton, AB: Alberta Education, 2002. <http://education.alberta.ca/admin/special/resources/unlocking.aspx>.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders: Fifth edition*. Arlington, VA: American Psychiatric Association, 2013.
- Brabeck, Mary, Jill Jeffrey, and Sara Fry. *Practice for Knowledge Acquisition (Not Drill and Kill)*. American Psychological Association. [www.apa.org/education/k12/practice-acquisition.aspx#](http://www.apa.org/education/k12/practice-acquisition.aspx#).
- Dean, C.B., E.R. Hubbell, H. Pitler, and B. Stone. "Monitoring the Student-Specific Planning Process" *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement*, 2nd Edition. Denver, CO: Mid-continent Research for Education and Learning, 2012.
- Graham, S., and K. Harris. *Writing Better: Effective Strategies for Teaching Students with Learning Difficulties*, 1st Edition, Baltimore, MD: Paul H Brookes Publishing Co., Inc., 2005.
- Larkin, M. J., and E. S. Ellis. "Strategic instruction for adolescents with learning disabilities". In B. Y. L. Wong (Ed.), *Learning about learning disabilities* (2nd ed., pp. 585-656). San Diego, CA: Academic Press, 1998.
- Manitoba Education. *Student-Specific Planning: A Handbook for Developing and Implementing Individual Education Plans (IEPs)*. Winnipeg, MB: Manitoba Education, 2010. [www.edu.gov.mb.ca/k12/specedu/programming/iep.html](http://www.edu.gov.mb.ca/k12/specedu/programming/iep.html).

Manitoba Education and Advanced Learning. *Policies and Procedures for Provincial Tests*. Winnipeg, MB: Manitoba Education and Advanced Learning, 2015. [www.edu.gov.mb.ca/k12/assess/docs/pol\\_proc/](http://www.edu.gov.mb.ca/k12/assess/docs/pol_proc/).

Manitoba Education, Citizenship and Youth. *Appropriate educational programming in Manitoba: Standards for Student Services*. Winnipeg, MB: Manitoba Education, Citizenship and Youth, 2006. [www.edu.gov.mb.ca/k12/specedu/documents.html](http://www.edu.gov.mb.ca/k12/specedu/documents.html).

Manitoba Education and Training. *Success for All Learners: A Handbook in Differentiating Instruction: A Resource for Kindergarten to Senior 4 Students*. Winnipeg, MB: Manitoba Education and Training, 1996.

Ministry of Education. *Teachers Make the Difference: Teaching Students with Learning Disabilities at Middle and Secondary Levels*. Saskatchewan, Canada: Ministry of Education, 2009. [www.gov.sk.ca/Teachers-Make-the-Difference](http://www.gov.sk.ca/Teachers-Make-the-Difference).

Saskatchewan Learning. *Teaching Students with Reading Difficulties and Disabilities: A Guide for Educators*. Regina, SK: Saskatchewan Learning, 2004.

University of Nebraska-Lincoln. "Cognitive Strategy Instruction". *Special Education and Communication Disorders*. Lincoln, NE: University of Nebraska-Lincoln, 2009. <http://cchs.unl.edu/>.

# Appendix 2-A

## Classroom Observation

Classroom teachers know their students and are able to observe them in their daily environment. They are in the best position to recognize the strengths and needs of their students. They are also in the best position to address those needs through appropriate educational programming. Classroom teachers are often the first to recognize that a student is struggling to learn.

Classroom teachers often first recognize learning needs through classroom observation. A teacher who is concerned about a student may watch for, record, and interpret behaviours linked to the following:

- What are the learning tasks and activities the student finds manageable/challenging?
- Are certain subjects or areas of skill easier or more difficult for the student?
- How does the student practice skills and apply new concepts?
- To what extent is the student able to follow oral/written directions in a variety of situations?
- How often and in what context does the student participate?
- Does the student remain focused on a topic?
- What types of questions does the student prefer to answer?
- Are the student's responses to questions organized and complete?
- How does the student get the teacher's attention?
- Does the student ask for clarification and/or help when they are having difficulty?
- How does the student get help?
- Are there consistent error patterns in work and test samples that inform aspects of academic performance?
- What is the quality of student interaction with peers and adults (e.g., turn-taking, initiating conversation, responding to others, making inappropriate comments)?
- How does the student behave in structured and unstructured settings?
- How does the student perform academically in structured and unstructured settings?
- How much and what type of teacher feedback does the student receive?
- To what extent is the student aware of classroom and school routines?
- What time of day does the student find manageable/challenging?
- Are the student's areas of strength, talent, or interest being utilized?

## Appendix 2-B

This appendix includes links to tools that can be used to collect observational data.

- ABC Chart

This chart is used to collect data on a student's behaviours.

Manitoba Education. *Towards Inclusion: Supporting Positive Behaviour in Manitoba Classrooms*. Winnipeg, Manitoba: Manitoba Education, 83.

[www.edu.gov.mb.ca/k12/specedu/behaviour/behaviour\\_document.pdf](http://www.edu.gov.mb.ca/k12/specedu/behaviour/behaviour_document.pdf).

- Focused Observation Template

This chart is used to collect observations for formative assessment using curricular outcomes or developmental continuum behaviours.

Manitoba Education, Citizenship and Youth. *Listening and Speaking: First Steps into Literacy: A Support Document for Kindergarten Teachers and Speech-Language Pathologists*. Winnipeg, Manitoba: Manitoba Education, Citizenship and Youth, 2008. 81.

[www.edu.gov.mb.ca/k12/cur/ela/list\\_speak/index.html](http://www.edu.gov.mb.ca/k12/cur/ela/list_speak/index.html).

- Ecological Inventory

An ecological inventory is one method of determining the instructional needs of students with significant special learning needs.

Manitoba Education and Advanced Learning. *Supporting Inclusive Schools: A Handbook for Resource Teachers in Manitoba Schools*. Winnipeg, Manitoba: Manitoba Education and Advanced Learning, 2014. 70-71.

[www.edu.gov.mb.ca/k12/specedu/res\\_teacher/index.html](http://www.edu.gov.mb.ca/k12/specedu/res_teacher/index.html).

- Functional Behavioral Assessment (FBA)

Functional behavioural assessment (FBA) is a systematic process of gathering data by various methods (reviewing records, interviewing, observing, etc.), examining the student's environment, and determining relationships.

Manitoba Education and Advanced Learning. *Supporting Inclusive Schools: A Handbook for Resource Teachers in Manitoba Schools*. Winnipeg, Manitoba: Manitoba Education and Advanced Learning, 2014. 73.

[www.edu.gov.mb.ca/k12/specedu/res\\_teacher/index.html](http://www.edu.gov.mb.ca/k12/specedu/res_teacher/index.html).

# Module 3

## Supporting Students with *Reading Disabilities*

A decorative graphic consisting of ten colored circles of various sizes and colors (purple, blue, green, pink, red, brown) arranged in a cluster to the left of the text.

This module provides information about the characteristics of students with reading disabilities as well as programming approaches to support these students.

## ● Key Ideas in this Module

- Reading disabilities account for the majority of all learning disabilities.
- Effective instructional practice for students with a learning disability is a combination of direct instruction, strategy instruction, and time for rehearsal and practice.
- Effective reading requires strength in building meaning using cues and conventions of language, reading fluency, and reading comprehension.
- Good teaching practices work for all students but are essential for students with a reading disability. Two teaching practices that may assist students with a reading disability across curricular areas are gradual release of responsibility and Before, During and After (BDA).

Listening, speaking, reading, writing, viewing, and representing are the six areas of language arts that are essential from early childhood through our adult lives. Even though reading and writing are presented in separated modules, it is important to remember they are closely linked.

## ● What Is a Reading Disability?

A reading disability is a learning disability that involves an impairment of reading accuracy, speed, or comprehension and is significant enough to interfere with academic achievement and/or activities of daily life. Students with reading disabilities have average or above average intelligence but experience a disparity between their cognitive abilities and their ability to read. Their difficulties can be unexpected in relation to their age or the amount and quality of instruction they have received.

In the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), the diagnostic term “Specific Learning Disorder with Impairment in Reading” is used as outlined in Module 1 for individuals who experience difficulty with word reading accuracy, reading rate or fluency, or reading comprehension. (p. 67, DSM-5)

Dyslexia is an alternate term used to describe specific reading difficulties that result from visual/perceptual difficulties with print that effect spelling, decoding, and word recognition. The term ‘reading disabilities’, used in this module, encompasses a range of difficulties that include word recognition, fluency, and reading comprehension.

A reading disability is not a cognitive disability. Students with reading disabilities have average or above average cognitive ability. Their difficulty is learning to read.

- Up to 80% of children with learning disabilities have difficulty learning to read. (World Summit Learning Disabilities, December 2008)
- Almost 40% of Canadian youth do not have adequate literacy levels. (Literacy Matters: A Call to Action)

## ● Characteristics of Students with Reading Disabilities

A student with a reading disability may experience difficulty in any combination of the following areas:

- **Difficulty mastering letter sounds and vocabulary:** Students with reading disabilities tend to have difficulty learning letter sounds, combinations of sounds, and vocabulary words.
- **Difficulty monitoring performance:** Students with reading disabilities are not usually adept at monitoring their own understanding of reading material.
- **Failure to apply strategies learned in a variety of contexts:** The strategies that support successful reading vary in subject/content areas and also vary from one assignment to the next. Reading a textbook, for example, requires different strategies and skills than reading a story. Students with reading disabilities do not adjust their strategies accordingly.
- **Difficulty in generalization:** Students with reading disabilities have difficulty transferring concepts that have been learned in one context to another context.
- **Memory problems:** Students with reading disabilities often demonstrate challenges with memory and have difficulty retaining their understanding from reading material.
- **Over-dependency:** Students with reading disabilities tend to be over-dependent on others for direction in their learning. This impacts reading assignments, which tend to be individual assignments.
- **Approaching a task:** Students with reading disabilities may have a history of limited success or repeated failure, and they may not approach a challenging learning task with a positive attitude.

## ● Instructional Strategies to Support Students with a Reading Disability

Good first teaching is essential for students with reading disabilities. What works for students with reading disabilities can work for other students too. There is no one solution, each student learns differently and the severity of learning needs can vary from mild to moderate to severe.

Students with reading disabilities require extensive time and practise to learn the skills involved with reading. Efforts must be intense and prolonged with teaching and reading

sessions that take place over a significant amount of time. It is crucial that students have access to a variety of reading materials that are meaningful, engaging, and at their level.

When educators and/or the student support team select strategies and interventions for students with reading disabilities, they should consider two aspects of learning: the subject-area content that must be mastered and the cognitive processes required to learn. Direct instruction, or explicit teaching, is recommended to teach content. Strategy instruction is the way in which cognitive processes are strengthened. Rehearsal and practice is the way in which new information becomes learning.

Research has shown that the most effective intervention for learning disabilities involves

- direct instruction
- strategy instruction
- rehearsal and practice

(See [Module 2](#))

## ● Assistive Technology

Even with skilled classroom instruction, some students with a reading disability will continue to struggle. When the school team has determined through the assessment process that the student is not progressing, assistive technology may be required. Assistive technology is a term used to describe any piece of equipment or software used to increase a student's efficiency with learning, maintaining function, or improving capacity. These tools allow a student with a reading disability to demonstrate their intelligence and knowledge by allowing them access to materials, strategies, content, and processes to meet curricular outcomes.

## ● Early Years

Emerging evidence suggests that reading disabilities can be detected in very young children through the observation of an inability to manipulate individual phonemes. (Yopp, 1992) The inability to distinguish sounds and reproduce phonemes can lead to difficulty in primary reading skills. This leads to difficulties in Kindergarten and Grade 1 when children begin to learn letter and sound associations. Children may begin to fall behind in their recognition of written letters and simple words and, by the end of Grade 1, they may display the characteristics of a child with a reading disability.

By the time they enter school, children may have difficulties, including the following:

- delayed language skills (expressive and receptive);
- poor phonological skills;
- difficulty with phonics;



- poor retention of rote information.

Throughout the elementary years, students may have difficulty with the following:

- naming and recognizing letters;
- retaining a store of sight words;
- understanding relationships between sounds and letters;
- tracking on the page as they read.

## Teaching Materials/Methods to Support Reading in Early Years

For young, struggling readers in the classroom, there are many materials, resources, teaching methods, and technologies that can be used to support learning. Some examples include the following:

- A word-rich classroom environment to create word awareness;
- Word-walls to display a collection of words in the classroom;
- Word games, words-of-the day, or mystery words to introduce new words;
- High-interest, low-vocabulary books;
- Books with supports such as large print and ample space between words;
- Reading material that is at the instructional or independent grade levels of the students with difficulty reading, which may be well below their current grade level;
- Reading material that is engaging for both genders;
- On-line resources such as You-Tube or other Web resources with audio;
- Reading material that includes many sight words to increase automaticity;
- Reading material that can be decoded;
- Alternative ways of telling stories (e.g., felt board stories, puppets to dramatize well-known stories, audio books);
- Alternative ways of presenting new information (e.g., using sensory modalities such as tactile and kinaesthetic, as well as traditional modalities);
- Choral reading and reader's theatre to add fun to oral reading;
- Buddy systems for reading;
- A supportive environment where students are comfortable and prepared for oral reading or not required to read aloud;
- Ongoing, constructive feedback for students as they read.

## ● Middle Years and Senior Years

Some students show signs of reading disabilities in pre-school or early years; however, for other students, reading disabilities will not become evident until they are older and they are required to “read to learn.” Often, these children are able to mask or hide their reading difficulties due to the fact that they have average intelligence and strengths in their communication, creative thinking skills, and problem-solving abilities. Some students with reading disabilities can read words accurately but cannot comprehend what they read because they lack other reading pre-requisite skills such as diverse vocabulary and fluency.

Some warning signs that students in middle years and senior years may have enduring reading difficulties include ongoing problems with the following:

- vocabulary;
- sentence patterns, punctuation, and word order;
- text patterns and the order of ideas;
- fluency;
- comprehension.

### Supporting Reading in Middle Years and Senior Years

If a student with a reading disability does not receive support in the early years or if the learning disability does not become apparent until the student is older, the student may develop strategies to disguise their inability to read or may become disengaged from learning. The increased academic demands of middle and senior years includes greater complexity of tasks, increased amounts of information, and a need to comprehend complex text. ‘Reading to learn’ requires students to have a level of automaticity, fluency, and memory in order to comprehend the text. This is very difficult for a student with a reading disability.

Educators must ensure that students continue to build on foundational literacy skills while also learning new skills in order to become efficient and proficient readers. Some of these skills include the following:

- reading with purpose in a variety of print material;
- using the reading strategies that they have learned or are learning;
- selecting materials of interest;
- figuring out the meaning of unfamiliar words;
- integrating new information with known information (activating prior knowledge);
- locating ideas and themes in text;
- questioning the reader, the author, and the text;
- making inferences and predictions, drawing conclusions;

- recognizing the writer's perspective;
- differentiating between fact and opinion;
- creating visual and sensory images from text.

## Teaching Materials/Methods to Support Reading in Middle Years and Senior Years

- Use graphic organizers appropriate to the task. (e.g., story maps, sequence of events charts, timelines, cause and effect charts, etc.) It is easier for the brain to remember images than words. Graphic organizers help students combine pictures and language to create "mind maps" or "concept maps" which help make sense of new information, and improve concentration and retention.
- Use visual organizers when presenting new concepts, especially abstract or difficult concepts.
- Provide directions that are simple and concise.
- Write directions in sequential steps on the board.
- Select reading material at student's instructional or independent level (may be below current grade level).
- Engage students in guided discussion and group talk.
- Ensure classroom pace allows plenty of room for student response (opportunity to respond).
- Ensure that students who may be distracted by audio and visual stimuli are seated where they are able to concentrate.
- Use choral reading and reading theatre to add fun to oral reading.
- Provide the student with additional time for tests and assessments or, if necessary, a reader.

## Assistive Technology (AT) to Support Reading in Middle Years and Senior Years

The use of assistive technology can free up mental energy for comprehension; built in dictionary features can help build vocabulary and highlighting features can help identify main ideas.

Manitoba Education and Advanced Learning provides educational support services for Manitoba students with print disabilities (i.e., students who are blind or have a visual impairment, a physical disability, or a learning disability). The supports are intended to provide students with the resources that are required to allow them to participate in educational programs along with their peers.

These supports include the following:

1. Resources (including audio books) are available from the Alternate Format On-Site Collection-Manitoba Education Library at [www.edu.gov.mb.ca/k12/afs/](http://www.edu.gov.mb.ca/k12/afs/).

For further information, contact

204-945-7835 or, toll free, 1-800-282-8069, ext. 7835 or 7838

Email: [iruafe@gov.mb.ca](mailto:iruafe@gov.mb.ca)

2. Assistive Technology Lending Library Service  
[www.edu.gov.mb.ca/k12/specedu/pdf/at\\_brochure.pdf](http://www.edu.gov.mb.ca/k12/specedu/pdf/at_brochure.pdf)

Program and Student Services

Manitoba Education and Advanced Learning

Telephone: 204-945-7907

Toll Free in Manitoba: 1-800-282-8069, ext. 7907

Email: [pssbinfo@gov.mb.ca](mailto:pssbinfo@gov.mb.ca)

3. Examples of text-to-speech software, scan and read software, and word processing software include the following:

- **Adobe Digital Editions:** [www.adobe.com/products/digitaleditions/](http://www.adobe.com/products/digitaleditions/);
- **CAST Learning Tools:** [www.cast.org/learningtools/index.html](http://www.cast.org/learningtools/index.html);
- **Don Johnston Readoutloud software:** <http://donjohnston.com/readoutloud/>;
- **Eurovocs Suite Document reader:** [www.jabbla.com/products.asp](http://www.jabbla.com/products.asp);
- **Hal:** [www.dolphinuk.co.uk/products/hal.htm](http://www.dolphinuk.co.uk/products/hal.htm);
- **HELP Read:** [www.ldpride.net/helpread.htm](http://www.ldpride.net/helpread.htm);
- **Kurzweil Educational Systems: Text to Speech Literacy Software:** [www.kurzweiledu.com/](http://www.kurzweiledu.com/);
- **Microsoft Reader Software:** [http://download.cnet.com/Microsoft-Reader/3000-20412\\_4-10047475.html](http://download.cnet.com/Microsoft-Reader/3000-20412_4-10047475.html);
- **OpenBook:** [www.openbooktoronto.com/](http://www.openbooktoronto.com/);
- **TextHelp! Read and Write:** <https://www.texthelp.com/en-us>;
- **Text to Speech Software:** [www.naturalreaders.com](http://www.naturalreaders.com);
- **WindowEyes:** [www.gwmicro.com/](http://www.gwmicro.com/);
- **WYNN:** [www.freedomscientific.com/LSG/products/wynn.asp](http://www.freedomscientific.com/LSG/products/wynn.asp);
- There are many **Reading Apps** available through the Apple Store. See [www.teacherswithapps.com/50-best-ipad-apps-for-reading-disabilities/](http://www.teacherswithapps.com/50-best-ipad-apps-for-reading-disabilities/);
- **Android OS** offers a wide variety of tools. As well, the Chrome browser supports **screen readers** and magnifiers;
- **Google Apps** also provides the same type of reading supports for students. See [www.google.ca/accessibility/all-products-features.html](http://www.google.ca/accessibility/all-products-features.html).

## ● Supporting Students with a Reading Disability in the Skill Areas of Reading

Reading is generally understood to be the extraction of meaning from written words on a page. This process requires a number of complex and interrelated skills. Students with reading disabilities often have difficulties with one or more of these skill areas, which include

1. Building meaning using the cues and conventions of language (including phonological awareness, phonemic awareness, phonics, vocabulary development, awareness of sentence structures, awareness of text structures and organizational patterns, and the pragmatics of text)

(Source: Saskatchewan Learning. *Teaching Students with Reading Difficulties and Disabilities: A Guide for Educators*. Regina, Saskatchewan: Saskatchewan Learning, 2004.)

2. Fluency
3. Comprehension

Research has found that each of the skill areas is important in teaching children with reading disabilities. All skill areas must be integrated and taught systematically and explicitly through a balanced approach.

### Building Meaning Using the Cues and Conventions of Language

Language is the foundation for reading. Consequently, we need to pay attention to the elements of the language and its cueing systems, as well as the critical role they play in reading.

Typically, children in early years focus on phonological awareness and phonics, whereas throughout the grades there is emphasis on vocabulary development, awareness of sentence and text structure, organizational patterns, and the pragmatics of text.

Students with learning disabilities have difficulty with cueing systems and generally demonstrate low levels of vocabulary and a lack of understanding of semantics. Students must have a level of automaticity in word recognition and meaning to become successful and fluent readers. Students with reading disabilities must be able to employ strategies that focus on the learning of new vocabulary words.

The cueing systems are the elements of oral and written language, including:

- sounds;
- the collection of words;
- word order patterns;
- the larger units and patterns that form text.

These systems communicate and cue intended meaning.

The conventions are the expected form or manner that these cues should take, including the:

- spelling of words;
- punctuation of sentences;
- format of text such as paragraphs.

## Supporting Building Meaning Using the Cues and Conventions of Language through Direct Instruction

Explicit or direct instruction in vocabulary helps all students learn new words and develop independence in the construction of meaning from text. It is important that educators dedicate a portion of regular classroom lesson time to explicit vocabulary instruction in reading and language arts classes as well as content area classes such as math, science, and social studies as follows.

- Teach oral and written vocabulary and link new words to prior knowledge.
- Teach students the definition of new vocabulary words and provide context.
- Teach words in the context of a selection or unit.
- Teach students to use contextual clues to understand meaning.
- Teach students to combine parts of words to create new words.
- Teach students to use reference resources such as dictionaries.
- Teach students to use punctuation and to recognize its function.
- Teach students to read a variety of texts for a variety of purposes.

## Supporting Building Meaning Using the Cues and Conventions of Language through Strategy Instruction

- Teach mnemonic strategies for learning new words.
- Create relationships between new and known words (a thesaurus may be useful).
- Have students select new words to use in oral reports and written assignments.
- Help students develop analogies for new vocabulary words.

## Supporting Building Meaning Using the Cues and Conventions of Language through Rehearsal and Practice

- Provide repeated reading experiences and multiple exposure to words.
- Provide multiple exposure to words in a variety of contexts.
- Check for comprehension: Do not assume students understand new words.
- Give students the opportunity to discuss setting, character, and events.
- Have students practice one-way and two-way communication, as well as group discussions.

## ● Reading Fluency

Reading fluency means being able to read quickly, knowing what the words are and what they mean, and using proper expression to emphasize words or phrases. As reading skills develop, students spend less time decoding individual letter sounds and words and more time reading entire words and phrases together as a unit, pausing for punctuation and using appropriate intonation. Students with limited fluency laboriously sound out words but are so focused on the process of decoding that they cannot comprehend the meaning of words and sentences. These students have difficulty with phonological processing, which is the ability to understand the relationship between words and sentences, words and syllables, and syllables and sounds (phonemes).

Incomplete or delayed automaticity in word recognition and poor decoding skills often cause difficulties with comprehension in middle and senior grades. Reading fluency is the bridge between decoding and comprehension. When students are able to spend less time and energy decoding, they are able to devote more time and energy to understanding what they read.

### Supporting Reading Fluency through Direct Instruction

- Extensively model fluent reading.
- Model dramatic reading and partner students for dramatic reading.
- Teach students to self-identify reading errors.
- Provide students with corrective feedback.

“Research has shown that many children who read at the third grade level in grade 3 will not automatically become efficient comprehenders in later grades. Therefore, teachers must teach comprehension explicitly beginning in the early years, and continuing through high school.”

Source: Rand Report (2002). Reading for Understanding, p.12.

### Supporting Reading Fluency through Strategy Instruction

- Link reading to prior knowledge.
- Have students engage in multiple readings (three to four times).
- Incorporate choral reading in the classroom.
- Have students read along with books on a computer using a “read” program such as text to speech programs or software.

### Supporting Reading Fluency through Rehearsal and Practice

The following strategies need to reflect the individual student’s comfort level with reading aloud because of the difficulties they experience due to their reading disability. Teachers may need to scaffold the strategy to ensure the student remains engaged.

- Provide frequent opportunities to practice reading silently or orally.
- Encourage students to re-read selected passages.
- Have students do repeated readings to develop fluency and to prepare for buddy reading.
- Use variations of paired or buddy reading, such as the following:
  - Student-Adult Reading: The adult reads one-on-one with the student; the adult reads first and then the student reads until the reading becomes fluent (perhaps three or four times through a passage).
  - Partner Reading: Fluent reader's partner with less fluent readers to take turns reading aloud to each other. Each reader may provide assistance to the other.
  - Choral Reading: Students read as a group in choral or unison reading.
  - Assisted Reading with Audio Recording: Students read along to a recording of a fluently read text. At first, students should point to each word as it is read and read along with the recording several times.

## ● Comprehension

Although the skill areas necessary for reading (decoding, word recognition, and fluency) are presented separately in this chapter, they are, in fact, overlapping skills and each of them supports comprehension. Comprehension of written language is a skill that impacts all aspects of educational achievement. Students with reading disabilities often have difficulty recalling ideas and details of written text and drawing appropriate conclusions from what they read.

By the time students reach middle and high school years they are expected to read at a competent level. Not only are they surrounded by text, the instruction they receive at school may be based on the assumption that they are able to read and process information delivered through print. Comprehension of text in content areas (history, math, science, health) may be particularly challenging as the reading material requires careful attention to detail and requires a skill set that may not have been mastered.

It is essential for educators in content areas to teach reading comprehension skills. Strategies such as summarizing, and generating and answering questions related to text can help students improve their comprehension.

### Supporting Comprehension through Direct Instruction

- Clearly define the purpose of reading.
- Teach students that reading is about deriving meaning and that comprehension is the reason to read.
- Model active reading. (Teacher thinks aloud as s/he reads aloud to the class.)



- Teach students to summarize.
- Teach students to identify relevant and irrelevant information.
- Teach students to ask and answer questions related to text.

## Supporting Comprehension through Strategy Instruction

- Work with topics in which students are interested and about which they know; help students make connections between their knowledge and new information (e.g., use K-W-L Charts: Know/Want-to-Know/Learned charts).
- Model a think-aloud strategy: Read a story, pause, and predict what the text may be about. Summarize text and link key words to prior learning.
- Model a strategy for visualizing: What do I visualize as I read this text? Work with students to create mental images from words they read.
- Model predicting: What will happen next?
- Have students underline and highlight important words and phrases in texts, handouts, and notes.
- Teach students the ‘Stop, Think, and Write’ strategy to help students keep an ongoing record of their comprehension. At determined intervals, students should stop reading and, using a T-chart or sticky notes, write down an important idea or fact, observation, or question.
- Have students use informal writing to reflect on what they have read. If students are reading in class, have them highlight, place a sticky, or write questions on a note card or a piece of paper to indicate areas of confusion or a few key points about their understanding.
- Teach self-monitoring strategies: If I don’t understand a word what can I do? Do I need to re-read this section? Is this fact or opinion? (See [Appendix 3-A](#).)
- The teacher determines the readability of the selected text to ensure that it is at the student’s independent reading level. For example: Free online software tools to calculate readability: Coleman Liau index, Flesch Kincaid Grade Level, ARI (Automated Readability Index), SMOG at [www.online-utility.org/english/readability](http://www.online-utility.org/english/readability).
  - The teacher teaches the student to use the readability tool to self-determine if print material is at their independent reading level.
- The teacher shows students how to apply strategies to a variety of texts.
- The teacher implements the use of graphic organizers to help students identify and understand key concepts.
- The teacher implements the use of an assistive technology tool such as See-N-Read, Kurzweil, or Solo Read: Outloud 6.

## Supporting Comprehension through Rehearsal and Practice

- Self-Regulated Strategy Development (SRSD) can be an effective strategy.
  - Provide guided practice as students are learning a new strategy.
  - Gradually transfer responsibility for defining purpose and selecting strategies to the student.
  - Provide monitoring and feedback.
- Use guided reading sessions.
- Have students apply strategies to different texts.
- Provide frequent opportunities to monitor all of the above.

## Supporting Students with a Reading Disability Across Curricula Areas

Two instructional practices that will support a student with a reading disability and be helpful for all students are the following:

- Before, During, and After Reading (BDA);
- Gradual Release of Responsibility.

## Before, During and After Reading (BDA)

Skilled, proficient readers are able to engage in a complex relationship with text; they can conjure visual images from words they read, make predictions, ask questions, and apply what they read to what they know. For some readers, these strategies and skills seem to come naturally. In reality, however, they are learned. Each strategy and skill that students learn has a relationship to the process of reading. Some are applied before reading, some during, and some after reading (BDA). Each strategy and skill can be broken down into its component parts, explicitly taught and supported through strategy instruction. This process can increase a struggling reader's chances for success at reading. (See [Appendix 3-A](#).)

### Before Reading

- Activate prior knowledge (K-W-L): Students are able to understand and make sense of what they read when they are able to make connections with what they know. K-W-L stands for 'Know, Want-to-Know, and Learned'. A discussion before reading can help students clarify what they already know.
- Set purpose for reading. A discussion before reading will help students understand why they are reading a particular text. The brain likes context and relevance.

- Investigate the structure of the text: Teachers can help students learn to investigate text structure by looking at chapter headings and subheadings, pictures and diagrams, indices, quotes, highlighted text, and so on.
- Predict the content of the text: A discussion before reading can help students make predictions about the text.
- Review and clarify vocabulary.

## **During Reading**

- Metacognition is an essential component of good reading. In order to be engaged in text and understand what they are reading, students must learn to ask questions about what they are reading, re-read text when they are unsure of the meaning, and think about what has happened and what is going to happen.
- Students can learn to alter the pace of their reading, and make adjustments for the level of difficulty and purpose of text. A student can learn, for example, that it is okay to skim over difficult place names when reading for pleasure. When reading academic texts, however, they may need to take time to understand pronunciation, context, and meaning. They can use resources such as glossaries and strategies such as re-reading, self-questioning, summarizing, taking notes, pronouncing difficult words out loud, and so on.

## **After Reading**

Students must have the opportunity to process information, think and talk about text, and interpret what they have read. They can:

- Assess whether the purpose of reading was met.
- Identify details and main ideas.
- Make comparisons and connections.
- Draw conclusions.
- Paraphrase important information.
- Summarize.
- Analyze (e.g., form opinions, make judgments).

## **Gradual Release of Responsibility**

Students with reading difficulties work as hard as or harder than typical readers but require intensive instruction and practise in order to acquire the skills necessary to read. No matter how well a skill is modeled or a strategy is taught, a struggling reader must

gain independence in order to succeed. A teacher must gradually transfer responsibility for a new learning to the student.

The gradual release of responsibility model of instruction (Pearson & Gallagher, 1983) requires that the teacher shift from assuming all of the responsibility to a situation in which the student(s) assume all of the responsibility for the learning task. This may occur over a day, a week, a month, or a year, depending upon the learning task and the strengths and needs of the student(s).

For more information on the effective use of the gradual release of responsibility model, please see

Manitoba Education, Citizenship and Youth. *A Continuum Model for Literacy with ICT Across the Curriculum: A Resource For Developing Computer Literacy (2006)*. Winnipeg, Manitoba: Manitoba Education, Citizenship and Youth, 2006. Section 2, p. 16. [www.edu.gov.mb.ca/k12/tech/lict/resources/handbook/index.html](http://www.edu.gov.mb.ca/k12/tech/lict/resources/handbook/index.html).

Manitoba Education and Youth. *Independent Together: Supporting the Multilevel Learning Community (2003)*. Winnipeg, Manitoba: Manitoba Education and Youth, 2003, p. 2.8, [www.edu.gov.mb.ca/k12/docs/support/multilevel/](http://www.edu.gov.mb.ca/k12/docs/support/multilevel/).

Fisher, Dr. Douglas. *Effective Use of the Gradual Release of Responsibility Model*. San Diego, California: San Diego State University. [www.epd-mh.com/mhpd\\_assets/Effective\\_Use\\_Douglas\\_Fisher.pdf](http://www.epd-mh.com/mhpd_assets/Effective_Use_Douglas_Fisher.pdf)

Pearson, DP, Fielding, L. *Comprehension Instruction*. Handbook of Reading Research. Vol.2, Longman Publishing Group, 1991.

## ● Summary

A student with a reading disability can achieve a high level of success at school. Teachers must understand that a reading disability is a neurological disorder and must provide students with direct/explicit instruction along with strategy instruction, as well as time to rehearse and practice skills to mastery. Students with reading disabilities face many challenges, however, with appropriate interventions and adaptations, they can become increasingly independent and have the same opportunities as their peers.

Module 3 addresses the needs of students with a learning disability in the area of written language. Even though it is addressed in a separate module, as mentioned at the beginning of this module, it is important to remember that reading and writing are closely linked.

## References

- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders: Fifth Edition*. Arlington, VA: American Psychiatric Association, 2013.
- Bender, W. *Learning Disabilities; Characteristics, Identification and Teaching Strategies*. Boston, MA: Allyn & Bacon, 2008.
- Buehl, D. *Classroom Strategies for Interactive Learning, 4th Ed*. Newark, DE: International Literacy Association, 2014.
- Burns, M. *How to improve literacy deficits for struggling students*. February 2010. [www.scientificlearning.com](http://www.scientificlearning.com).
- Burke & Associates Inc. *A Call to Action: World Summit on Learning Disabilities*, (December 2008). Prepared by: Burke & Associates Inc. for the Organizing Committee of the World Summit on Learning Disabilities.
- Dehaene, S. *Reading in the brain*. New York, NY: Penguin Books Ltd., 2010.
- Kamil, M.L., G.D. Borman, J. Dole, C.C., Kral, T, Salinger, J., and Torgeson. *Improving adolescent literacy: Effective classroom and intervention practices: A practise guide* (NC#2008-4027). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education, 2008. <http://ies.ed.gov/ncee/wwc>.
- MacInnis, C. and H. Hemming. "Linking the Needs of Students with Learning Disabilities to a Whole Language Curriculum." *Journal of Learning Disabilities*, 28, 1995.
- Saskatchewan Learning. *Teaching Students with Reading Difficulties and Disabilities: A Guide for Educators*. Regina, Saskatchewan: Saskatchewan Learning, 2004.
- Snow, C. *Reading for Understanding; Towards an R&D program in reading comprehension*. Pittsburgh, PA. Rand Education, 2002.
- Toronto Dominion Bank Financial Group. *Literacy Matters: A Call to Action* (June 20, 2013).
- Yopp, HK. *Developing Phonemic Awareness in Young Children*. *The Reading Teacher*, vol.45, no.9, May 1992, pp. 696-703.

# Appendix 3-A

## Taxonomy of Self-Questioning Chart

Use the following “Taxonomy of Self-Questioning Chart” to teach students to self-monitor their comprehension. The chart includes six areas of questioning that students can “check” after each reading session. Each question provides a focal point for students to practise thinking about what they have read. Teachers must model the thinking process for each of the six questions in order for students to become proficient in using this strategy.

Taxonomy of Self-Questioning			
Level of thinking	Comprehension self-assessment	Focusing question	Comprehension process
Creating	I have created new knowledge.	How has this author changed what I understand?	<ul style="list-style-type: none"> <li>■ Synthesizing</li> <li>■ Creating mental images</li> </ul>
Evaluating	I can critically examine this author’s message.	What perspective or authority does the author bring to what he or she tells me?	<ul style="list-style-type: none"> <li>■ Inferring</li> </ul>
Analyzing	I can explore deeper relationships within the author’s message.	What is the author arguing and what support, evidence, and reasoning does the author present?	<ul style="list-style-type: none"> <li>■ Inferring</li> <li>■ Determining importance</li> </ul>
Applying	I can use my understanding in a meaningful way.	How is this similar to (or different from) what I’ve heard or read before?	<ul style="list-style-type: none"> <li>■ Making connections</li> <li>■ Inferring</li> <li>■ Determining importance</li> </ul>
Understanding	I can understand what the author is telling me.	What does this author want me to understand?	<ul style="list-style-type: none"> <li>■ Determining importance</li> <li>■ Inferring</li> <li>■ Creating mental images</li> </ul>
Remembering	I can recall specific details, information, and ideas from this text.	What do I need to remember to make sense of this text?	<ul style="list-style-type: none"> <li>■ Determining importance</li> </ul>

Source: Buehl, D. *Classroom Strategies for Interactive Learning*, 4th Ed. Newark, DE: International Literacy Association, 2014. Used with permission. All rights reserved.

# Module 4

Supporting Students  
with Learning Disabilities  
in *Written  
Expression*

A decorative graphic consisting of ten colored circles of various sizes and colors (purple, brown, blue, green, pink, orange) arranged in a cluster to the left of the main title.

This module provides information about the characteristics of students with a learning disability in written expression as well as programming approaches to support these students.

## ● Key Ideas in this Module

- Students with a learning disability in written expression can have difficulties with all aspects of writing.
- Writing instruction is an integral and meaningful part of the curriculum in all subject/content areas.
- Educators should use a process-oriented approach to writing instruction.
- Students with writing disabilities can benefit from the use of assistive technology to support their learning.
- Instructional methods that include direct instruction, strategy instruction, and practice/ rehearsal are effective approaches to supporting students with identified writing disabilities.

## ● What Is a Learning Disability in Written Expression?

A learning disability in written expression affects the ability to write and organize thoughts using appropriate detail, sequence, sentence structure, and literary form. In order to progress academically, students must be able to effectively express their knowledge in writing. For students with writing disabilities, writing difficulties exist on two levels: (Schumaker & Deschler, 2003)

1. Transcription skills, which include handwriting, spelling, punctuation, and grammar
2. Composition/expressive writing skills, which include generating ideas, planning, organizing, and revising thoughts/ideas to communicate meaning in a written product (composition)

In the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (2013) (DSM-5), the diagnostic term “Specific Learning Disorder with Impairment in Written Expression” is used as outlined in Module 1, specifically for individuals who experience difficulty with spelling accuracy, grammar and punctuation accuracy, and/or clarity or organization of written expression. (p. 67, DSM-5)

Students with a learning disability in written expression do not have a cognitive disability. Students with writing disabilities have average to above average cognitive abilities. Their difficulties with writing are not caused by problems with vision, hearing, or fine motor control but these conditions can complicate their writing difficulties.



## ● Characteristics of Students with a Learning Disability in Written Expression

During the school year, students are expected to take notes, write assignments, and take tests; all of which require fluent and legible handwriting. When transcription skills are not automatic, students must direct their time and cognitive energy toward the basic writing skills involved with handwriting, spelling, and grammar instead of more complex skills such as planning, organizing, and revising. As a result, these students may have difficulty with every stage of writing, from thinking of ideas through to revision and editing.

Not only can students' perception of themselves be affected by the quality of their handwriting, other people sometimes make judgments about intelligence and capability based on poor handwriting.

By the time students with writing disabilities reach middle years and high school levels, their compositions are generally shorter, less organized, less varied in vocabulary, and of lower quality than their peers who do not have a learning disability.

Students with a disability in written expression may have difficulty in the following areas:

Whether a student has difficulties with transcription or expressive writing skills, the quality of writing will be affected.

*(Teaching Students with Reading Difficulties and Disabilities p. 46 /Beringer, Abbott, Whitaker, Sylvester & Nolan, 1995.)*

### Transcription Skills

- **Mechanical aspects of writing:** The handwriting of students with a writing disability is often less legible than their peers and they tend to make considerably more spelling, grammar, and punctuation errors.

### Composition

- **Generating content:** Students with a writing disability are capable of generating the ideas orally. Their difficulty may lie in the mechanics and organization skills needed to initiate and endure the task during the time allotted. They consequently often do not spend much time preparing to write. They do not recognize the value of the pre-writing phase and they do not know what to do with time allotted for pre-writing unless guided.
- **Creating and organizing compositional structure:** Students often begin writing what comes to mind or what they can easily remember. They do not adequately frame stories/compositions; they repeat simple sentences; and they use short, "choppy" sentences as well as run-on sentences.
- **Revising text and formulating goals:** Students tend to focus on correcting punctuation, grammar, and spelling errors rather than organizing ideas, refining content, and completing the task.

- **Understanding the purpose of writing:** Students often view writing assignments as question/answer tasks that require little preparation. As such, if they feel the question has been answered, they may abruptly end their composition.

Adapted from Steve Graham, [steve.graham@vanderbilt.edu](mailto:steve.graham@vanderbilt.edu) ppt from CEC Convention 2010.

## Supporting the Student with a Learning Disability in the Area of Written Expression

To become proficient writers, all students must learn to synchronize multiple skills in transcription and composition. For students with a learning disability in written expression, additional instructional interventions and adaptations to support learning in both these areas are essential for them to be successful. The combined use of direct instruction, strategy instruction, practice, and rehearsal is the most effective way of addressing writing disabilities.

A decision related to the appropriate use of compensatory strategies like assistive technology can help a writer with a learning disability overcome the barriers of frustration and disengagement.

For some students with persistent difficulties with written expression (transcription or composition) who may or may not have a formal diagnosis of a learning disability, the collaborative process of student-specific planning may be necessary. Early intervention is important so that the student remains motivated and engaged in the learning process. The student-specific planning team may recommend instructional strategies, adaptations, or appropriate assistive technology to assist the student in accessing the curriculum therefore allowing the student to show what they are capable of when the act of writing is supported appropriately.

### Transcription

As the student progresses to middle years and beyond it is important for educators to keep in mind that a learning disability is lifelong and that some students may not develop the skills necessary to use written expression fluently or easily, even with interventions and extensive direct instruction. At some point, the support team may need to make a decision about refocusing from intensive instruction to teaching adaptations and using assistive technology (AT) and other compensatory strategies that the student can use throughout life.

For example, the team may decide that the energy and time required to physically write assignments is no longer practical for the student. Instead, the student would benefit more by learning to use assistive technology, such as speech-to-text software (e.g., Dragon Naturally Speaking Software, [www.nuance.com/dragon/index.htm](http://www.nuance.com/dragon/index.htm)) for notes and assignments. Effort may be directed toward practicing keyboarding skills so that the student's work is more legible and is completed in a shorter time frame. These or other compensatory strategies may help the student produce longer and more in-depth written discourse, enable the student to keep up with note-taking, and allow the student to feel more capable when demonstrating what they know.

In order for educators to best support learning they should begin by identifying the skill areas in which the student is having difficulty. Analysis of a student's writing samples can be an effective way to gather this information, which can then be used to select appropriate instructional strategies and to make decisions about the appropriate lifelong compensatory strategies. Consider low, mid, and high tech support when making your plan. Refer to the [Assistive Technology](#) section in Module 2.

For information on supporting transcription skill development, refer to [Appendix 4-A](#).

## Composition

A learning disability in written expression affects a student's ability to generate and organize thoughts on paper using appropriate detail, sequence, sentence structure, and literary form. Effective writers are able to work through each stage of the writing process, from planning to revision, and produce a coherent written product. Students with disabilities in written expression benefit from direct or explicit instruction, strategy instruction, and rehearsal and practice at each stage of the writing process.

Traditional instruction in written expression emphasizes the conventions of mechanics (e.g., handwriting, spelling, grammar, punctuation) but shifting the focus of instruction to the conceptual aspects of writing, such as generating ideas, planning, organizing, and revising allows students to focus on composition skills.

## Note Taking in Content Areas

Note taking requires the ability to listen, comprehend, and retain information while processing the new information and summarizing the important points into a useful format. The physical act of writing must occur simultaneously with these cognitive processes. Notes must be taken quickly, automatically, and legibly.

As curriculum requirements increase in volume and complexity, students with a writing disability may find note taking challenging. The McREL study also suggests that *note taking strategies are not intuitive and that all students benefit from explicit instruction in how to take notes*. Students with a learning disability in written expression will need explicit instruction, strategy instruction, and opportunities to rehearse and practice note taking on a more frequent basis.

Current research builds on the premise that the ability to complete a coherent, organized written product such as an essay is more critical than mastering transcription skills.

*"Findings from McREL's 2010 study indicated that summarizing and note taking have positive effects across content area and grade levels, with note taking having a significant higher impact on learning than summarizing does."*

*Ceri B. Dean et al. 2012. p.79.*

## Supporting Note Taking through Instruction

- Teach students a variety of note taking formats. In conjunction with the student determine which one works the best, then focus on that strategy until it is mastered and

can be applied in all content areas. For example, visual learners often prefer webbing while other learners may prefer column-style note taking.

- Provide explicit instruction of note taking through teacher modeling and demonstration .
- Provide explicit corrective feedback to improve note taking skills.
- Teach students shorthand techniques such as the use of symbols, abbreviations, and contractions.
- Allow note taking to include drawings/pictures of what students are learning instead of just writing.
- Provide students with partially completed notes that they need to fill in as they follow along.
- Give students teacher prepared notes and ask students to highlight the main ideas in one colour and the supporting details in another colour.
- Teachers can provide the daily notes for the subject in an electronic format.
- Allow the use of audio devices to record the information being given orally.
- Set up a buddy system to support note taking or provide a scribe.
- Highlight and extract notes from electronic print material to supplement class notes.
- For more information, please see the article Teaching Students to Take Class Notes written by Emily Levy in 2007. It is available at [www.ldonline.org/article/teaching\\_students\\_to\\_take\\_class\\_notes?theme=print](http://www.ldonline.org/article/teaching_students_to_take_class_notes?theme=print).

### Supporting Note Taking through Rehearsal and Practice

- Provide students with frequent opportunities to practice note taking using a template or structure that demonstrates what is important using familiar information. (See Note-Making Frames on pages 6.53-6.55 of *Success for all Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*.)
- Use graphic organizers like webbing, mind maps, and concept frames.
- Teach a strategy for note taking (e.g., two-column note taking) and then use this strategy in all areas of note taking to provide lots of practice. (See Note-Making on pages 6.82-6.84 of *Success for all Learners: A Handbook for Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*.)
- Provide time for students to share their thinking with peers.
- Provide opportunity for students to revise notes and use them for review (helps students see the purpose and aids their understanding).
- Determine which strategy works best for individual students and give many opportunities to use these strategies in a variety of content areas.
- Assist the student in advocating for the use of this strategy with other teachers when note taking.

## Supporting Note Taking through Assistive Technology (AT)

- Encourage and provide opportunities for the student to develop keyboarding skills.
- Experiment with note taking software (Draft Builder (SOLO), Inspiration—[www.inspiration.com/](http://www.inspiration.com/) and [www.donjohnston.com/draftbuilder/](http://www.donjohnston.com/draftbuilder/)).
- Experiment with a word processor with Microsoft Word, Google Chrome, and Mac accessibility features.
- Experiment with a portable keyboard (iPad, wireless keyboard).
- Experiment with text-to-speech software (Microsoft Narrator at <http://windows.microsoft.com/en-CA/windows-xp/help/use-narrator>).
- Experiment with Read and Write Gold at [www.texthelp.com/](http://www.texthelp.com/).
- Experiment with Kurzweil 3000 at [www.kurzweiledu.com/](http://www.kurzweiledu.com/).
- Experiment with word predication software (Co:Writer (SOLO) at [www.donjohnston.com/solo/](http://www.donjohnston.com/solo/), EZ keys for Windows at [www.ez-keys.software.informer.com/](http://www.ez-keys.software.informer.com/), Words+ at [www.words-plus.com/](http://www.words-plus.com/), and Read and Write Gold at [www.texthelp.com/](http://www.texthelp.com/)).
- Experiment with voice-to-text software (e.g., Dragon Naturally Speaking at [www.nuance.com/dragon/index.htm](http://www.nuance.com/dragon/index.htm)).

## Assessment Strategies to Support Note Taking

- Accept alternatives to written products to demonstrate knowledge (e.g., oral presentations).
- Have the student present audio recordings instead of written products.
- Allow the use of a word processor to complete tests related to the notes that student took.
- Allow for additional time for written assignments and tests, or provide tests in alternative formats like multiple choice or matching which decreases the amount of writing required.

## Supporting Composition through Instruction in Content Areas

Students learn to write by writing; therefore, they need frequent opportunities to write. Instructional efforts should be explicit, frequent, and focused on formative feedback to support student learning. The following strategies can be used to support students who struggle with written expression/composition. They can also benefit all students and are easily integrated into classroom instruction.

- Model the writing process and demonstrate its usefulness in the content areas.
- Show students examples of good writing within the subject area you teach.

- Teach students specifically about different writing forms (e.g., Descriptive, Expository, Narrative, and Persuasive writing), their characteristics, and examples, particularly if this is the type of writing expected in the subject area you teach.
- Help students make connections to prior knowledge related to language, subject content, and the world, in general. (For more information, see Prior Knowledge and Vocabulary Strategies on pages 6.20-6.36 of *Success for all Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*.)
- Provide direct instruction in sight vocabulary for student-specific writing.
- Give students opportunities to talk about their writing.
- Teach students strategies to help them become independent writers.
- Hold writing conferences with students during various stages of writing in the content areas to provide support, feedback, and opportunity for guided revision to ensure they are getting the content knowledge.
- Provide rubrics with exemplars and encourage students to self-assess and peer-assess products that require written components.
- Teach the use of an assignment calculator which breaks down large projects into manageable steps. See the following link for an example: [www.lib.umn.edu/help/calculator](http://www.lib.umn.edu/help/calculator).

Students with learning disabilities may be confused by differences in writing requirements from one subject to the next. Using a consistent model helps the student become a more confident writer through repetition. Although different subjects require different types of writing assignments, the production of all writing can involve the same process and follow the same stages or steps.

For example, your school may support the use of the 6 +1 Writing Traits Model or the POWER model (Plan, Organize, Write, Edit, and Revise), or another strategy to assist students in developing a written assignment whether in English Language Arts or a content area.

Consistency in process also assists with memory issues as students have to master one single process which can be used throughout their schooling rather than isolated skill sets.

Teaching specific strategies related to the content areas benefits students with a learning disability and empowers them to advocate for what works for them. Refer to [www.ldonline.org/article/6201/](http://www.ldonline.org/article/6201/) for more information.

For more information on POWER, link to <http://coe.jmu.edu/LearningToolbox/power.html>.

For more information on 6+1 Writing Traits Model, link to <http://ethemes.missouri.edu/themes/1283>.

### Assessment Strategies to Support Writing in Content Areas

- Look for alternative ways students can demonstrate what they know or have learned in the content area.
- Accept alternatives to written work.

- Break down the assignment into manageable parts and assign marks for completing the parts.
- Allow assistive technology to enhance proofing and editing skills, or assist students when they have to produce written work.

## ● **Composition: Supporting Students through the Stages of the Writing Process**

This section includes information to support the following stages or steps of the writing process:

1. generating ideas;
2. developing and organizing ideas;
3. revising;
4. editing.

### 1) **Generating Ideas**

Students must learn to come up with ideas and write down what they know about a topic. They also need the skills to assess whether their writing is on-topic and fulfills its intended purpose. Some students find it difficult to:

- Decide what to write about;
- Decide what to write or include in a report;
- Come up with their own ideas;
- Write about their opinions.

### **Supporting the Generation of Ideas through Instruction**

- Facilitate topic selection through mini-lessons, discussion, and modeling.
- Brainstorm ideas as a whole group, or as small teacher-facilitated groups with students who need more support with how to brainstorm ideas for writing.
- Make connections to the students' lives, interests, and strengths.
- Provide opportunities to talk and to remember events.
- Encourage students to jot down ideas and use their drawings for inspiration.
- Allow students to write about their own ideas.
- Allow students to write for different audiences.
- Encourage interviewing, listening to music, observing, and viewing.
- Teach students how to read about or do research on related topics.

- Provide explicit instruction on how to use graphic organizers, how to pick an idea, and so forth.
- Teach how to construct thought webs and use graphic organizers.

### **Supporting the Generation of Ideas through Rehearsal and Practice**

- Provide opportunity and time to explore and research different topics about which to write.
- Check on the students frequently to ensure success.
- Encourage students to create and keep a list of ideas for future writing topics.
- Remind students to revisit the list and add to it or delete from it as necessary.

### **Supporting the Generation of Ideas through Assistive Technology**

- Use technology for the initial generation of ideas (recording devices, voice recognition software, Kidspiration or Inspiration software—[www.inspiration.com/kidspiration](http://www.inspiration.com/kidspiration)).

### **Assessment Strategies to Support the Generation of Ideas**

- Promote self-reflection on what strategies worked with regard to the generation of ideas.
- Accept alternatives to written lists of ideas.
- Assign marks for completing steps in the writing process rather than waiting for the final product.

## **2) Developing and Organizing Ideas**

Expressive writing requires an organizational schema: a plan for where and how to begin and what to do next in the process. Students who have a hard time organizing ideas may have difficulty with the following:

- Getting started with a writing assignment;
- Grouping thoughts or concepts into common themes or writing down their thoughts in the appropriate order;
- Thinking in advance about what they are going to write (they just start writing);
- Gathering the books, paper, pencils, and so on they need to write;
- Estimating how long it will take to write a report or story.



Effective writers use strategies to organize thoughts, and information to make connections for writing. Mind maps, webs, clusters, think sheets, and frames are all terms for graphic organizers. Graphic organizers are visual displays of thinking and are an effective tool for students with learning disabilities as they can help students visualize and monitor their progress throughout the writing process. Webs and maps give students the opportunity to see connections and relationships by organizing and grouping ideas and information into topics and sub-topics. (Refer to page 4-23 for further information.)

For additional information on graphic organizers, see Chapter 6 of *Success for all Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*.

### **Supporting the Development and Organization of Ideas through Instruction**

- Provide students with sample graphic organizers to guide them in sorting and organizing information and notes.
- Create a selection of graphic organizers for students to reference and use.
- Use beginning and advance organizers to give the planning stage some structure.
- Provide personalized kits to support students' writing efforts (e.g., prompt cards, personal dictionaries, markers, highlighters, scissors, glue, and sticky notes for selecting ideas and information). Some teachers have individual sets of supplies in a plastic resealable bag and call it the student's toolbox.
- Provide students with direct instruction about how to develop outlines or summarize materials read.

### **Supporting the Development and Organization of Ideas through Rehearsal and Practice**

- Model the development and organization of ideas by selecting a familiar topic.
  - Have students form discussion groups.
  - Ask them to recall what they already know about the topic and questions they still have on the topic.
  - Students take turns and record one idea or question on a sticky note and place it in the middle of the table. Encourage students to build on each other's ideas.
  - When students have contributed everything they can recall about the topic, they can sort out and organize their sticky notes into meaningful clusters on chart paper.
  - Ask students to discuss connections and relationships, and identify possible sub-headings and categories. Provide students with markers or highlighters to draw connections among the sticky notes.
  - Display the groups' work. They will have created a mind map or graphic organizer.

- Give lots of practice before working independently.
  - Teachers may work with a small group of students to do a group development and organization of their ideas before working independently.
  - Teachers may need to scaffold and determine skills to be taught or re-taught for students to be successful.

### **Supporting the Development and Organization of Ideas through Assistive Technology**

- Allow students to use computers instead of transcribing their assignment by hand.
- Use computer software such as Inspiration or Kidspiration™ ([www.inspiration.com/Kidspiration](http://www.inspiration.com/Kidspiration)) to assist with the organization of ideas.
- Investigate prompting programs for the computer that ask a set of questions or present reminders as writers progress through the various stages of writing, especially in the drafting stage.

Use word prediction software programs. (e.g., Co-writer or word processors with word banks) so that a student can focus on the composition versus the spelling or legibility.

### **Assessment Strategies to Support the Development and Organization of Ideas**

- Some students might only be able to use computer generated software because writing is too labour intensive and they wouldn't be able to get their great ideas out if they were expected to fill out the graphic organizer independently.
- Allow for less detailed outlines to help frame their thoughts (3 layers: main topics, subtopics, and supporting details).
- Allow their planning and thinking sheet to be their outline.
- At this stage of development have exemplars available for students to compare their own work with.

## **3) Revising**

Once students have written a draft of a story, paragraph, or essay they should be encouraged and supported to improve their written product. Students must be able to work individually and in groups to assess their own work and the work of others for content, clarity, form, and style; and, during the editing stage, for errors in grammar, punctuation, and spelling. Teachers need to be sensitive to and cognizant of students' comfort level and esteem in sharing their work with peers. Sharing of work should always start with a trusted adult.

At the revision stage, students should focus on the meaning of text and not allow the mechanical aspects of their work, such as handwriting, spelling, punctuation, and grammar, to overshadow the organization and coherence of their writing.

The TAPS strategy can be used to help students focus ideas and provide constructive feedback. The TAPS strategy should be used to emphasize organization, clarification, and the elaboration of ideas rather than the mechanical aspects of writing.

Revising is a term that refers to making changes to the ideas in a written product. This may involve adding details, deleting details, or changing word order to clarify ideas and points of view.

- The TAPS mnemonic stands for the following:
  - T: Tell the person what you liked about the written product.
  - A: Ask questions about parts that are unclear.
  - P: Provide suggestions for making the writing better.
  - S: Share the revised work.

The Before, During and After (BDA) process can be used to teach strategies such as the TAPS strategy. (Refer to page 4-24 for further information.)

### **Supporting Revisions through Instruction**

- Allow students to use computers to produce written products in order to make the process of revising and editing less labour-intensive.
- Teach specific strategies for revising their writing.
- Teach students how to revise their work focusing only on content.
- Provide guidelines for revisions.
- Provide checklists for students to begin to self-evaluate their work.
- Praise parts of the written product that are well explained and ask questions to help the students clarify areas of confusion. The following chart contains examples of questions and praise that teachers can use to benefit students in their writing and model the metacognitive process related to revisions.

Praise (be specific and give concrete examples that demonstrate/explain your praise)

- This work really seems complete. Here is your main idea, here are the supporting details, and finally here is your conclusion (pointing out each concrete example).
- I really like the way you wrote... (Be specific!)
- Your point of view is very clearly stated when you said, ...
- Your supporting details are very strong in this paragraph (identify these details by reading aloud to the student or by different coloured sticky notes to highlight each supporting detail.
- Your introduction is very strong. (Explain what you mean by strong by indicating how they made it strong—choice of words/phrase/analogy/alliteration, etc.)

Questions (be specific and give concrete examples that clarify your question so they know how to fix the issue)

- Your writing doesn't seem finished because I don't know what happened to the main character. What are your plans for finishing it so the audience knows what happened to your main character?
- This part confuses me: I'm not sure who is saying this statement. What could you do to make it clearer to the reader?
- You seem to want to defend the no hat rule but you have not indicated why no hats in class are important. How can you make your argument stronger?
- What is your topic sentence? I'm thinking it is this one but it is at the end of the paragraph. How could you rearrange the ideas in this paragraph to have a clear topic sentence?

### Supporting Revision through Rehearsal and Practice

- Frequently model how to revise text using a think aloud strategy.
- Provide frequent opportunities for students to revise teacher prepared material to practice this skill.

### Supporting Revision through Assistive Technology

- Examine the use of writing software such as SAS Curriculum Pathways' Writing Reviser at [www.sas.com/resources/demos/curriculum\\_pathways/writingreviser/writingreviser.html](http://www.sas.com/resources/demos/curriculum_pathways/writingreviser/writingreviser.html), Co-Writer, Read and Write Gold, and so on.
- Teach how to use word processing software to move sentences and so on rather than having to do extensive copying over previously written text.
- Speech synthesis software or hardware which translates texts into speech is not as natural-sounding as digitized speech but its advantage is that it can be used to speak any text. A computer system used for this purpose is called a **speech synthesizer** and can be implemented in software or hardware products.
- Teach students how to use thesaurus programs on the word processor to enhance their use of words.
- Provide a visual thesaurus such as [www.visualthesaurus.com/](http://www.visualthesaurus.com/).

## Assessment Strategies to Support Revision

- Provide exemplars for comparison by students at this stage of the process.
- Revise chunks of material rather than the whole assignment.
- Focus on the content of the writing versus the transcription.
- Have students highlight the revisions that they made. When you meet with them ask what they changed and why.
  - Changed the beginning to be stronger. It used to say... now it starts...
  - Used some million dollar words... Instead of said, I used whispered.
  - Used adverbs or adjectives, or both.
- Determine the number of changes required according to the student's needs.

## 4) Editing

Editing is a term that refers to one of the final stages of completing a written product. Editing a piece of writing involves the correction of spelling, punctuation, and grammar. Professional writers often combine editing with proofreading to polish a piece so that it's ready and acceptable for publication. Students can use the COPS strategy to remind them of what to look for when editing their work or the work of their peers.

- The COPS mnemonic strategy stands for
  - C—Capitalization: Does a capital letter appear at the beginning of each sentence and as the first letter of every proper noun? (Point out the relationship between periods and upper case letters.)
  - O—Overall appearance: Is the work neat and attractively formatted?
  - P—Punctuation: Is the punctuation correct?
  - S—Spelling: Are the words spelled correctly?

The Self-regulated Strategy Development (SRSD) model (see [Module 2 pages 2-22 to 2-26](#)) can be used to teach strategies such as TAPS or COPS.

Students gain independence when they develop strategies for proofreading their own work. It is important that we teach how to proofread by modelling and through practice. It is also important to determine what strategy works for each student and to ensure we provide opportunities to use those strategies until mastered so that they can be applied in a variety of contexts.

## Support for Editing through Instruction

- Teach students how to use the spell-check feature using the procedural strategy CHECK (Check the beginning of the word, Hunt for the correct consonants, Examine the vowels, Changes in suggested words may give hints, Keep repeating previous steps) when editing work on the computer.
- Teach how to use the grammar check program on word processor software such as Microsoft® Word or Ginger Software (see [www.gingersoftware.com/grammarcheck](http://www.gingersoftware.com/grammarcheck)).
- Model thinking and reasoning by explaining each procedure in the editing process.
- Provide students opportunities to edit their own work in chunks with specific goals.
- Avoid red marks and negative comments.
- Provide students with a checklist of mechanical skills.
- Teach students about editing marks.

## Supporting Editing through Rehearsal and Practice

- Frequently model how to edit using a think aloud strategy.
- Provide frequent opportunities for students to edit teacher prepared material to practice this skill.
- Scaffold the editing stage until the student can do a section independently.

## Supporting Editing through Assistive Technology

Encourage students to use a word processor such as Microsoft® Word from the start of the writing, not at the end of the editing stage.

- Encourage students to use features such as track changes and editing marks.

## Assessment Strategies to Support Editing

- Encourage students to revisit older writing samples to see the progress they have made in their writing.
- Recognize that every piece of writing doesn't have to be edited; only those that the teacher and student jointly determine should be completed to 'publication'.

## Module Summary

Students with writing disabilities can have difficulties with all aspects of writing. Writing instruction should be an integral and meaningful part of the curriculum in all subject areas. Instructional methods that include direct instruction, strategy instruction, and rehearsal and practice are effective approaches to support students with writing disabilities, and benefit all students. The process-orientated approach to writing instruction in the content areas helps students with learning disabilities generalize strategies across curricular areas. Educators need to recognize that, at some point, an educational decision may need to be made as a team to reduce the focus on direct instruction and to identify the adaptations, the assistive technology and the other compensatory strategies that the student needs to master in order to facilitate a successful transition to post-school life.

## Reference List

- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders: Fifth edition*. Arlington, VA: American Psychiatric Association, 2013.
- Chalk, J.C., Hagan-Burke, M.D. "The effects of self-regulated strategy development on the writing process for high school students with learning disabilities." *Learning Disability Quarterly* 28 (winter), Hammill Institute on Disabilities, 2005. pp. 75-87. <http://ldq.sagepub.com/>.
- Dean, Ceri B., Elizabeth Ross Hubbell, Howard Pitler, and BJ Stone. *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement, 2nd Edition*. Alexandria, Virginia: ASCD, 2012.
- Graham, Steven, and Karen R. Harris. *Writing Better: Effective Strategies for Teaching Students with Learning*. Baltimore, MD: Brookes Publishing Co., 2005.
- Graham, S., and K.R. Harris. "Extra handwriting instruction: prevent writing difficulties right from the start." *Teaching Exceptional Children*. November/December 2000. Vol. 33, Issue 2, p.88.
- Graham, S., Harris, K.R., & Fink, B. "Is handwriting causally related to learning to write? Treatment of handwriting problems in beginning writers." *Journal of Educational Psychology*, Vol. 92(4), December 2000.
- Manitoba Education and Advanced Learning. *Manitoba Curriculum Guides*. [www.edu.gov.mb.ca/k12/cur/index.html](http://www.edu.gov.mb.ca/k12/cur/index.html).
- Manitoba Education and Training. *Success for all Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools*. Winnipeg, Manitoba: Manitoba Education and Training, 1996. [www.edu.gov.mb.ca/k12/cur/elements.html](http://www.edu.gov.mb.ca/k12/cur/elements.html).

Ontario Ministry of Education. *Think Literacy: Cross-curricular Approaches, Grades 7-12*. Toronto, Ontario: Ontario Ministry of Education, 2003.

<http://edu.gov.on.ca/eng/studentsuccess/thinkliteracy/files/writing.pdf>.

Schumaker, J. B., and D. D. Deshler. (2003). "Can students with LD become competent writers?" *Learning Disability Quarterly*, 26(2). Hammill Institute on Disabilities, 2003. 129-141

Sousa, David A. *How the Special Needs Brain Works*. Thousand Oaks, California: Corwin Press, 2007.

## Resources

Baker, S., R. Gersten, and S. Graham. (2003). "Teaching Expressive Writing to Students with Learning Disabilities: Research Based Applications and Examples". *Journal of Learning Disabilities*, 36(2), 109.

Chapman, Carolyn, and Rita King. *Differentiated Instructional Strategies for Writing in the Content Areas*. Thousand Oaks, California: Corwin Press, Inc., 2003.

King-Shaver, Barbara, and Alyce Hunter. *Adolescent Literacy and Differentiated Instruction*. Heinemann, 2009.

Ramsay, JD. "Can We Skip Lunch and Keep Writing?" *Collaborating in Class and Online, Grades 3-8*. Portland, ME: Stenhouse Publishers, 2011.

Santangelo, T., and Olinghouse, N.G., Effective Writing Instruction for Students who have Writing Difficulties, Focus on Exceptional Children December Volume 42: Number 4, p.1, 2009.

Sundeen, T. *So what's the big idea? Using graphic organizers to guide writing for secondary students with learning and behavioural issues*. Orlando, FL: University of Central Florida, 2007.

Troia, Gary A. (Editor). *Instruction and Assessment for Struggling Writers: Evidence Based Practices*. New York, NY: Guilford Press. 2009.

## Recommended links

- Learning Disabilities Association of America at <http://ldaamerica.org/educators/>
- American Federation of Teachers at [www.aft.org/](http://www.aft.org/)
- Center for Applied Special Technology (CAST) at [www.cast.org/index.html#VlzAp0CFO70](http://www.cast.org/index.html#VlzAp0CFO70)
- AccessSTEM at [www.washington.edu/doit/programs/accessstem/overview](http://www.washington.edu/doit/programs/accessstem/overview)



- Learning Through Listening (RFB&D) at [www.rfbd.org/](http://www.rfbd.org/)
- CAST at [www.cast.org/learningtools/index.html](http://www.cast.org/learningtools/index.html)
- [homepages.wmich.edu/~acareywe/engl479sum11.html](http://homepages.wmich.edu/~acareywe/engl479sum11.html)
- Cognitive Strategy Instruction Teaching Strategy: University of Nebraska Lincoln at <http://cehs.unl.edu/csi/>
- Self-Regulation at <http://cehs.unl.edu/csi/>
- How to Teach a Teenager with a Learning Disability How to Spell at [www.ehow.com/how\\_11461\\_teach-teenager-with.html#ixzzlmzU93Et6](http://www.ehow.com/how_11461_teach-teenager-with.html#ixzzlmzU93Et6)
- Memory and Children with Learning Disabilities at [www.education.com/reference/article/memory-children-learning/](http://www.education.com/reference/article/memory-children-learning/)

# Appendix 4-A

## Transcription Skills: Handwriting

### Supporting Handwriting through Instruction

- Model paper positioning, pencil grip, and letter and word formation.
- Provide directional arrow cues with numbered directions for tracing letters.
- Provide paper with raised lines to act as a sensory guide.
- Provide paper positioning marks on students' desks.
- Emphasize letters that are difficult to form, such as: *a, j, k, n, q, u, z* and those that are frequently reversed.
- Have students say the names of letters as they write them.
- Use strategies to support memory, such as: look, cover, and visualize the letter; then write, check for accuracy, and say the letter.
- Have the student practise writing letters from memory and circle letters that represent student's best work (develops student's ability to self-monitor handwriting skills).
- Experiment with different utensils and media.
- Have student practise writing letters and numbers in different sizes with different media.
- Use outlines of letters to create characters (pictograms) Ensure students have daily practise writing letters and words.
- Some school divisions have adopted a Handwriting without Tears program for younger students (evidence-based strategies to improve handwriting).
- Support the development of fluency and speed by giving the student frequent opportunities to practise composition.
- Allow the use of a word processor to complete tests.
- Accept point form answers or a completed graphic organizer for assignments/tests.
- Consider a take-home test if extra time is required.
- Allow oral testing (may be required on occasion or for portions of the test).

## Cursive versus Manuscript?

There are benefits to teaching both cursive and manuscript to beginning writers. Because of the relative simplicity and legibility of manuscript, as well as its use in printed texts, manuscript is often a better option for beginners. When carefully taught, it can lessen problems with writing.

Benefits of manuscript for beginners include the following:

- It is more familiar.
- It has fewer fine motor movements.

Benefits of cursive (or toward cursive) for beginners include the following:

- Reduces problems between word spacing.
- Avoids letter reversals.
- Trains kinesthetic memory.
- Eliminates need for transition from manuscript to cursive.

(Graham, Harris, & Fink, 2000)

## Transcription Skills: Spelling

According to stage (or phase) theory, children develop spelling skills over time. As they progress they make certain types of errors at each stage. It is important, therefore, for educators to focus on the types of errors students are making rather than the fact that they are making errors. Error analysis can help educators understand the reasons students are making mistakes and identify the skills students need to become better spellers. Classroom quizzes, writing assignments and tests can be meaningful sources for error analysis.

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Invented spelling serves as a transitional step between reading and writing. Spelling is closely linked to reading because reading involves breaking apart a spoken word and encoding the sounds into corresponding letters. Invented spelling allows children to gain phonemic awareness and practise applying the alphabetic principle.

Sousa, David A. 2007.

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## Supporting Spelling through Instruction

- Use word study programs that incorporate a developmentally appropriate approach. These can be found in books like *Words Their Way: Word Study for Phonics, Vocabulary and Spelling Instruction* and the Making Words Series (*Making Words; Making More Words; Making Big Words*).
- Chunk words: Word chunking is a strategy that involves breaking words into smaller, easily remembered parts. Single syllable words can be chunked (great: gr/ea/t) as well as multi-syllable words (fantastic: fan/tas/tic). Encourage the student to look for and think about smaller words within large words (“fan” in fantastic). Point out similarities among words and letter groupings (great is a “gr” word and an “ea” word).
- Make word families: This is a visual strategy that allows students to see word similarities by listing them together in “families.” Make a large chart in the classroom and add new words as you discover them. If a student is struggling with a particular word combination, make a chart for that word family.
- Use a hands-on approach to spelling. Many children with writing disabilities have difficulty with oral spelling; as such interactive spelling exercises can improve retention. Use word tiles, magnetic letters, flash, cards and other visual aids to make spelling hands-on and interactive.
- Use games like Scrabble and Spill and Spell to strengthen spelling accuracy in a fun way.
- Teach students to understand spelling rules. Use direct instruction to teach spelling rules and have students look at correctly and incorrectly spelled words to determine which rule applies and whether the rule is applied correctly.
- Encourage students to keep and use a personal dictionary of frequently misspelled words.
- Have the students use a computer, electronic spell-check, and/or word-prediction software such as *Write Outloud* (which also has a homonym checker).
- Allow students frequent opportunities to practise spelling.
- Encourage reading to support both spelling and reading difficulties. To that end, have students choose material that is interesting to them.
- Read with the students, have the students listen to books on tape.
- Do not penalize the students for spelling errors on tests and assignments.
- Allow the students to use a computer and spell-check for assignments and tests.

## Before/During/After (BDA) Strategy Process for teaching the use of a graphic organizer

The following BDA process can be used with strategies such as webs or maps. It should be used to emphasize the organization, clarification, and elaboration of ideas rather than the mechanical aspects of writing.

What Teachers Do Before, During and After (BDA)	What Students Do Before, During and After (BDA)
<p style="text-align: center;"><b>Before</b></p> <ul style="list-style-type: none"> <li>■ Select a specific writing task.</li> <li>■ Prepare a Smartboard, overhead transparency, or paper chart with possible ideas and information on the topic (e.g., point form notes for a report on the effects of global warming in a specific geographic region).</li> <li>■ Model the process of making connections (e.g., draw arrows, circle, number, colour code).</li> <li>■ Use a graphic organizer like webs or maps to group the information into meaningful clusters.</li> <li>■ Teach students to use computer programs that generate graphic organizers (e.g., Inspiration or Kidspiration software).</li> </ul>	<p style="text-align: center;"><b>Before</b></p> <ul style="list-style-type: none"> <li>■ Recall what you already know about the topic.</li> <li>■ Add to your own notes and make connections.</li> <li>■ Note the links and connections the teacher makes with ideas and information. Consider similarities and differences in your own thinking.</li> <li>■ Use a graphic organizer that works for you to record and organize your thinking.</li> </ul>
<p style="text-align: center;"><b>During</b></p> <ul style="list-style-type: none"> <li>■ Ask students to contribute to the class generated web by identifying important ideas and key information and suggesting how to place points to create a web.</li> <li>■ Use probing questions to stimulate their thinking and model how to put the ideas onto the web. <ul style="list-style-type: none"> <li>■ What is the main idea?</li> <li>■ What does this mean?</li> <li>■ Is this important? Why?</li> <li>■ What are the patterns and trends?</li> <li>■ What evidence is missing?</li> <li>■ Is a particular viewpoint evident?</li> <li>■ How are the ideas connected?</li> </ul> </li> <li>■ Model for students how to use the web to create an outline or template for writing a first draft. Help them identify subtopics, headings, and structure by exploring the connections and relationships on the web.</li> </ul>	<p style="text-align: center;"><b>During</b></p> <ul style="list-style-type: none"> <li>■ Contribute to the discussion.</li> <li>■ Note similarities and differences in responses.</li> <li>■ Suggest headings and sub-topics.</li> </ul>
<p style="text-align: center;"><b>After</b></p> <ul style="list-style-type: none"> <li>■ Provide students with a web to sort and organize their ideas and information for practice.</li> <li>■ Consider having students who are writing on similar topics work in pairs to create a web for their shared notes. Some students may prefer to use sticky notes, while others may prefer to cut and paste notes to the web.</li> <li>■ Ask students to study their webs and use them to create an outline for writing.</li> </ul>	<p style="text-align: center;"><b>After</b></p> <ul style="list-style-type: none"> <li>■ Reread notes and identify important information and ideas.</li> <li>■ Use question prompts from the “during” section (above) to re-phrase notes, identify key points, and group ideas and information to create your own web or a partner-group web.</li> <li>■ Share and compare webs.</li> <li>■ Explore the connection between the web and possible ways of organizing information for writing.</li> </ul>

## Supporting Revision: Before, During and After (BDA) Process for Revising with a Partner


The following BDA process can be used with strategies such as the TAPS strategy; it should be used to emphasize organization, clarification, and the elaboration of ideas rather than the mechanical aspects of writing.

What Teachers Do Before, During and After (BDA)	What Students Do Before, During and After (BDA)
<p style="text-align: center;"><b>Before</b></p> <ul style="list-style-type: none"> <li>■ Determine students' previous experience with the revision process.</li> <li>■ Introduce and discuss the strategy you have selected for revising or editing.</li> <li>■ Discuss the importance of the strategy you are introducing. (Point out that all professional writers have editors who help them).</li> <li>■ Provide direct instruction regarding the "how," "why," and "when" of the strategy.</li> <li>■ Use a writing sample based on the assigned subject area to model the strategy.</li> <li>■ Prepare a Smartboard, overhead, or paper copy of the writing sample.</li> </ul>	<p style="text-align: center;"><b>Before</b></p> <ul style="list-style-type: none"> <li>■ Listen to the teacher read the writing sample or assignment and follow along on your printed copy.</li> <li>■ Look and listen for areas of confusion or concern in the writing sample.</li> </ul>
<p style="text-align: center;"><b>During</b></p> <ul style="list-style-type: none"> <li>■ Put students in groups.</li> <li>■ Explain each of the steps and the thinking processes that are involved.</li> <li>■ Make statements/ask questions such as               <ul style="list-style-type: none"> <li>■ "What do I have to do next?" (defining focus)</li> <li>■ "That is the first step, now for the second step I have to..." (self-regulation)</li> <li>■ "I think I succeeded in making the descriptions better" (self-reinforcement and reflection).</li> </ul> </li> <li>■ Use the strategy and plan for maintenance until each student knows the steps from memory.</li> <li>■ Provide guided practise and opportunities to rehearse. Have students take turns being editors for their peers. Provide whatever support they need to use the strategy appropriately.</li> </ul>	<p style="text-align: center;"><b>During</b></p> <ul style="list-style-type: none"> <li>■ Offer suggestions about areas of confusion or concern.</li> <li>■ Exchange writing drafts with your partner or other group member.</li> <li>■ Repeat the procedures modeled by the teacher.</li> </ul>
<p style="text-align: center;"><b>After</b></p> <ul style="list-style-type: none"> <li>■ Support independent learning by fading the supports as each pair of students becomes proficient at using the strategy.</li> <li>■ Have the student practise independently. Provide feedback and review as necessary. Generalize/apply the strategies to other situations and writing tasks in the content areas.</li> </ul>	<p style="text-align: center;"><b>After</b></p> <ul style="list-style-type: none"> <li>■ Revise your own writing drafts based on your partner's prompts and questions.</li> <li>■ Use the strategy in your independent work whenever possible.</li> </ul>

Adapted from: Ontario Ministry of Education. *Think Literacy: Cross-curricular Approaches, Grades 7-12*. Toronto, Ontario: Ontario Ministry of Education, 2003. <http://edu.gov.on.ca/eng/studentssuccess/thinkliteracy/files/writing.pdf>.

# Module 5

Supporting Students with  
*Mathematics  
Disabilities*



This module provides information about the characteristics of students with mathematics disabilities (MD) and the interventions and adaptations needed to support their learning.

## ● Key Ideas in this Module

1. The term ‘mathematics disability’, as used in this module, encompasses a range of difficulties that include number sense, memorization of arithmetic facts, accurate or fluent calculation, and/or accurate mathematics reasoning.
2. A combination of direct instruction, strategy instruction, and time to practice is effective instructional practice for all students, particularly for students with a learning disability.
3. There are various instructional strategies that could be considered differentiated instruction or adaptations, depending upon how they are used.
4. If a particular strategy is essential to the success of a student with MD, the adaptation needs to be documented in the student’s IEP.

## ● What is a Mathematics Disability (MD)?

“MDs are learning disabilities that affect the development of skills in mathematics, such as understanding quantitative concepts, translating language-based problems into mathematical symbols, and following sequences of steps.” Students diagnosed with a disability in mathematics may also have difficulty recalling and understanding basic mathematics facts and often cannot remember the multiplication tables despite spending hours trying to memorize them. Students with MDs may have difficulty reading mathematical signs and copying numbers or figures correctly, as well as difficulty with direction and orientation, working memory, long-term memory, processing speed, and visual-spatial ability. (American Psychiatric Association, DSM-IV-TR, 2000; Payne and Turner, 1999)

In the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (2013) (DSM-5), the diagnostic term “Specific Learning Disorder with Impairment in Mathematics” is used as outlined in Module 1, specifically for individuals who experience difficulty with number sense, memorization of arithmetic facts, accurate or fluent calculation, and/or accurate math reasoning. (p. 67, DSM-5)

Dyscalculia is an alternative term used to refer to a pattern of difficulties characterized by problems processing numerical information, learning arithmetic facts, and performing accurate or fluent calculations. (p. 67, DSM-5) The term ‘mathematics disability’, used in this module, encompasses a range of difficulties that include number sense, memorization of arithmetic facts, accurate or fluent calculation, and/or accurate math reasoning.

“There is no need to change the content of the curriculum for students with learning disabilities. What must be done is what all good constructivist teachers do, and that is pay careful attention to the child and how he or she learns and design instruction (not content) that maximizes the strengths of the child while minimizing the impact of weaknesses.” Van de Walle. 2001.



## ● Characteristics of Students with Mathematics Disabilities

Students with MDs may have difficulties ranging from mild to severe that affect many areas of their lives. Students with MDs may have difficulty with the following:

- Telling and keeping track of time;
- Sequencing past and future events;
- Understanding abstract concepts of time and direction;
- Developing spatial orientation and space organization;
- Reading maps;
- Understanding mechanical processes;
- Following directions in sports that involve sequencing and rules;
- Keeping track of scores and players during games such as card or board games.

In the classroom, students with MDs often have difficulty with the following:

- Retrieving facts;
- Making estimates;
- Retaining information;
- Understanding aspects of counting (often students with MDs count on their fingers, commit counting errors, and use counting-all rather than counting-on);
- Remembering facts and formulas for completing calculations;
- Following sequential directions;
- Sequencing, which includes reading numbers out of sequence, making substitutions, reversals, omissions, and doing operations backwards;
- Problem solving (can become lost in the problem-solving process).

## ● Supporting Students with Mathematics Disabilities through Direct Instruction, Strategy Instruction, and Rehearsal and Practice

Students with MDs, like students with other learning disabilities, respond best to a combination of direct instruction, strategy instruction, and rehearsal and practice. The strategies outlined in this module will require direct instruction in order for students to reach mastery in their use.

The focus of mathematics instruction for all students should be to make mathematics experiences meaningful. Students make sense of mathematics when they are actively involved in doing mathematics and actively constructing meaning out of what they are doing. Students need opportunities to explore, develop, discuss, apply, and test ideas.

Mathematical experiences that develop from concrete experiences, followed by pictorial, and then abstract or symbolic representations allow students to attach meaning to what they do. This is important for all students, and critical for students with MDs.

In addition, “there are critical components that students must encounter in a mathematics program in order to achieve the goals of mathematics education and encourage lifelong learning in mathematics.” Many of the strategies discussed in this module are related to the seven mathematical processes (communication, connections, reasoning, mental mathematics and estimation, problem solving, visualization, and technology) which are “intended to permeate teaching and learning” (Manitoba Education. *Kindergarten to Grade 8 Mathematics Manitoba Curriculum Framework of Outcomes*. Winnipeg, Manitoba: Manitoba Education, 2013. 11. [www.edu.gov.mb.ca/k12/cur/math/frameworks.html](http://www.edu.gov.mb.ca/k12/cur/math/frameworks.html).)

Van de Walle (2001) states the following:

- Every day, students must experience that mathematics makes sense.
- Students must come to believe that they are capable of making sense of mathematics.
- Teachers must stop teaching by telling and start letting students make sense of the mathematics they are learning.

The learning environment should value and respect all students’ experiences and ways of thinking, so that learners are comfortable taking intellectual risks, asking questions, and posing conjectures. Students need to explore problem-solving situations in order to develop personal strategies and become mathematically literate. Learners must realize that it is acceptable to solve problems in different ways and that solutions may vary. (Manitoba Education and Advanced Learning. *Kindergarten to Grade 8 Mathematics Support Documents for Teachers*. Winnipeg, Manitoba: Manitoba Education and Advanced Learning, 2012 to 2015. 2.) (Mathematics Curriculum Supports, Manitoba Education and Advanced Learning. [www.edu.gov.mb.ca/k12/cur/math/supports.html](http://www.edu.gov.mb.ca/k12/cur/math/supports.html).)

## ● Supportive Strategies for Teaching Mathematical Concepts

During their years at school, students are expected to learn many complex mathematical concepts, especially in algebra, geometry, and advanced mathematics courses. The following strategies do not address specific mathematics concepts to be taught. Instead, these strategies can be generalized for teaching mathematics concepts to all students and may particularly benefit students who have MDs.

Any of these strategies can be considered differentiated instruction or adaptations, depending on how they are used. If a particular strategy is essential to supporting the needs of a specific student, it should be documented as an adaptation in the student’s individual education plan (IEP) so that this information can follow the student to other classes and schools (refer to the [Student-Specific Assessment](#) section of Module 2).

- **List steps for completion of mathematics problems on the board:** Use direct instruction to teach mathematics concepts by writing examples of multi-step mathematics problems on the board and making note of what is required to complete the problems. Always put the problem in the same place on the board and leave it there throughout the class. Number (don't use letters) the steps in the order they are to be completed.
- **Keep sample math problems visible:** Keep a step-by-step model of a problem on the board for students to refer to. If students have difficulty with working memory and can't hold the problem in mind while looking back and forth from the board, have them copy the problem onto a coloured card and keep it next to their work. If they can't remember to do this, ask another student to copy the problem for them.
- **Use a "paired-learning" teaching strategy:** Begin by demonstrating a problem, then put students into pairs and ask each student in the pair to make up his or her own problem, solve it, and write down the answer. The student then gives the blank problem to his or her partner to solve. If their answers are not the same, the students discuss the differences and make corrections. This strategy, also known as class-wide peer tutoring, provides the practise and rehearsal that all students, particularly students with MDs, require to learn new concepts.
- **Pair with another student:** If the teacher cannot use class-wide peer tutoring, the student in need of support can help identify another student who is willing and capable of answering the student's questions and can double-check to make sure homework assignments are written down.
- **Use group response:** One way to increase student involvement in class is to ask all students to solve a math problem and write the answer on a notebook-sized dry-erase board they can hold up for the teacher to see. (Go to [www.kleenslate.com](http://www.kleenslate.com) for an example.) Another suggestion is to have students whisper the answer as the teacher circulates around the room (which gives other students time to formulate their answers). This strategy allows the teacher to quickly assess which students don't yet understand the concept or outcome. Some teachers use wireless audience response systems (also known as "clickers", "keypads", or "clicker" apps for a similar purpose. (See <http://replysystems.com> for an example.)
- **Use songs or chants:** Examples of helpful resources can be found at Remedia Publications: [www.rempub.com/math](http://www.rempub.com/math).
- **Use association:** When setting up a problem, create an association with something familiar to the student. Try using the student's name in a sample word problem, or using metaphors, analogies, or examples from the students' daily lives.
- **Use Mathematics manipulatives:**

essential at all grade levels, from Kindergarten to Grade 12. It is worthwhile to plan ahead regarding how to manage this essential 'playtime', as well as how to manage the process of distributing and collecting the manipulatives. Once students have had a sanctioned opportunity to explore the materials, they will likely be more ready to use the manipulatives for learning mathematical concepts.

For more classroom organization strategies, see:

Manitoba Education. "Key Element Two: Classroom Organization." *Towards Inclusion: Supporting Positive Behaviour in Manitoba Classrooms*. Manitoba Education: Winnipeg, Manitoba. 2011. [www.edu.gov.mb.ca/k12/specedu/behaviour/index.html](http://www.edu.gov.mb.ca/k12/specedu/behaviour/index.html).

Manipulatives are important in providing **concrete, visual representation** for students and enhancing a student's learning of mathematics in the following ways (Small, 2009).

- Students can refer to the visual model even when they are not using the manipulative anymore.
- Students can work together cooperatively to solve mathematical problems.
- Students can discuss and verbalize their thinking about mathematical ideas.
- Students independence increases once the modelling has been provided by the teacher. (Refer to the [Gradual Release of Responsibility](#) section for further information.)

Once the students and teacher are ready to use the manipulatives to teach/learn mathematics concepts, teachers need to model the use of the manipulatives and then guide students in their use, providing commentary that links the concrete model with the concept being taught. In other words, the teacher needs to directly teach the concept and the use of the manipulatives. Marian Small's *Making Math Meaningful to Canadian Students, 2nd Edition*, provides many examples of concepts and how manipulatives can be used to represent the concept.

It is recommended that Mathematics teachers begin with **Base ten blocks** and **Attribute blocks** when building their classroom collection of manipulatives, as they are both extremely versatile in their use and can be used to support many concept development activities.

- **Base ten blocks** are used to teach basic mathematical concepts like place value, addition, subtraction, number sense, and counting.

For further information, go to the following URLs:

[www.bing.com/images/search?q=base+10+blocks&qpv=base+10+blocks&qpv=base+10+blocks&FORM=IGREwww.mathatube.com/base-ten-block-understanding.html](http://www.bing.com/images/search?q=base+10+blocks&qpv=base+10+blocks&qpv=base+10+blocks&FORM=IGREwww.mathatube.com/base-ten-block-understanding.html)

- **Attribute blocks** are usually used to describe a geometric pattern.

For further information, go to the following URL:

[www.bing.com/images/search?q=attribute+blocks&qpv=attribute+blocks&qpv=attribute+blocks&FORM=IGRE](http://www.bing.com/images/search?q=attribute+blocks&qpv=attribute+blocks&qpv=attribute+blocks&FORM=IGRE)

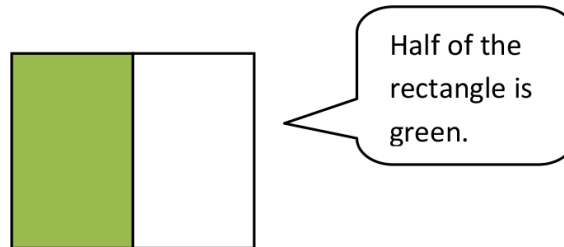
The following is a list of other useful manipulatives and examples of how they may be used:

- **Cuisenaire rods** are used to represent why  $20-8=12$  and can show why the least common multiple of 4 and 6 is 12 and also why  $2/3$  of  $3/8$  is  $2/8$ . ([www.cuisenaire.co.uk/](http://www.cuisenaire.co.uk/))
  - **Fraction strips** are useful in showing less than and greater than when it comes to comparing one fraction (e.g., when you are comparing  $3/8$  to another fraction such as  $2/5$ ). ([http://lrt.ednet.ns.ca/PD/BLM/pdf\\_files/fraction\\_strips/fs\\_to\\_twelfths\\_labelled.pdf](http://lrt.ednet.ns.ca/PD/BLM/pdf_files/fraction_strips/fs_to_twelfths_labelled.pdf))
  - **Coloured counters** can be used when discussing positive and negative integers [e.g.,  $5-(-2)$ ]. ([www.bing.com/images/search?q=coloured+counters&qpv=coloured+counters&FORM=IGRE](http://www.bing.com/images/search?q=coloured+counters&qpv=coloured+counters&qpv=coloured+counters&FORM=IGRE))
  - **Geoboards** can be used to represent possible distances and slopes when you connect one pin to another on the board. ([www.bing.com/images/search?q=geoboards&qs=n&form=QBIR&pq=geoboards&sc=2-9&sp=-1&sk=](http://www.bing.com/images/search?q=geoboards&qs=n&form=QBIR&pq=geoboards&sc=2-9&sp=-1&sk=))
  - **Algebraic tiles** can be used to represent variables and constants, and to represent and solve algebra problems. ([www.bing.com/images/search?q=algebra%20tiles&qs=n&form=QBIR&pq=algebra%20tiles&sc=0-0&sp=-1&sk=](http://www.bing.com/images/search?q=algebra%20tiles&qs=n&form=QBIR&pq=algebra%20tiles&sc=0-0&sp=-1&sk=))
- Use **pictorial representations** (see [Appendix 5-A](#)).

Once students have had the opportunity to explore and experience a mathematical concept concretely, the teacher can support them in moving on to **pictorial representations**. Students can use technology or hand-drawn pictures to represent numbers and fractions, and to communicate their understanding of what they have learned.

Figure 3

### Pictorial Representation



At this stage, students are able to create abstract or symbolic representations of concepts, numbers, fractions, and so forth. Through the use and creation of symbolic representations, students are demonstrating a deeper understanding of the concept. Their skills and understanding solidify further when they have frequent opportunities to describe, identify, and create representations of the mathematical concept. If students are unable to represent a concept in this more abstract way, the teacher will know that the student requires more practice at the concrete and/or pictorial stage.

The following is a simplistic example that illustrates the development of a concept through increasing levels of abstraction.

- Have students engage in everyday situations that use numbers and fractions (e.g., cutting a granola bar in half and sharing it with a friend).
  - Have students demonstrate the concept of “half” using manipulatives such as attribute blocks or algebraic tiles (in high school) to build the foundation of their knowledge.
  - Have students illustrate the concept of ‘half’ in various means (e.g., graph paper, art-mirror images, etc.).
  - Have students move to the symbolic level by writing various fractions to represent ‘half’ (e.g.,  $\frac{1}{2}$ ,  $\frac{2}{4}$ ,  $\frac{36}{72}$ , etc.).
- **Develop mnemonics:** (see [Appendix 5-B](#))
  - **Use Mathematics games:**

Many early, middle, and senior years teachers occasionally incorporate mathematics games into their teaching to practise concepts in a fun, interactive, and novel way. Van de Walle, Karp, Lovin, Bay-William (2014) indicate that games provide low-stress approaches to practicing basic facts while helping students to be more fact fluent. Also, when a student can choose from a collection of reasoning strategies, it allows the student to become more adept at selecting strategies. There are different mathematics games for every possible level of mathematics, from simple addition to complex algebra. Games also help build critical thinking skills which will help in all aspects of learning. Examples of mathematics games are listed below. For additional ideas, see the Manitoba Education and Advanced Learning supports at: [www.edu.gov.mb.ca/k12/cur/math/supports.html](http://www.edu.gov.mb.ca/k12/cur/math/supports.html).

- Middle Years Mathematics Activities and Games: [www.edu.gov.mb.ca/k12/cur/math/my\\_games/index.html](http://www.edu.gov.mb.ca/k12/cur/math/my_games/index.html).
- Early Years Mathematics Activities and Games: [www.edu.gov.mb.ca/k12/cur/math/games/index.html](http://www.edu.gov.mb.ca/k12/cur/math/games/index.html).
- The Center for Education in Mathematics and Computing, University of Waterloo, is another good source: [www.cemc.uwaterloo.ca/](http://www.cemc.uwaterloo.ca/).

In his book, *Styles and Strategies for Teaching Middle Grades Mathematics*, Dr. Thomas provides samples of Bingo questions and explains how teachers can make their own cards.

Many popular board games and game shows can be used to create Mathematics games. There are also many free apps for tablets. Examples include the following:

- [www.kidsmathgamesonline.com](http://www.kidsmathgamesonline.com);
- [www.sheppardsoftware.com/math.htm](http://www.sheppardsoftware.com/math.htm);
- [www.dyscalculia.org/math-tools](http://www.dyscalculia.org/math-tools);

- [www.brighthubeducation.com](http://www.brighthubeducation.com);
- [www.softschools.com/math/games/](http://www.softschools.com/math/games/);
- [mrnussbaum.com/mathgames/](http://mrnussbaum.com/mathgames/);
- [www.funbrain.com/brain/Adventure/SlingShot/index.html](http://www.funbrain.com/brain/Adventure/SlingShot/index.html).

- **Reduce note taking and writing:**

Photocopy pages for students so they do not have to take notes or rewrite math problems. Enlargements of original copies give students extra room to show work and write answers. This enables them to use their cognitive energy for completing the problems instead of copying them.

- **Work toward a deeper understanding of concepts allowing students to rework problems/questions where errors were made:**

Recommended resource:

Marzano, Robert J. *Marzano's (Nine) High-Yield Instructional Strategies*.  
[www.palmbeachschools.org](http://www.palmbeachschools.org).

(Adapted from the book: Marzano, Robert J., Debra J. Pickering, and Jane E. Pollock. *Classroom Instruction that Works: Research-based Strategies for Increasing Student Achievement*. Alexandria, VA: Association for Supervision and Curriculum Development (ASCD), 2001.

## ● Supporting Students with Mathematics Disabilities through Adaptations

As in the previous section, the following strategies do not address specific mathematics concepts to be taught. Instead, these strategies can be generalized for teaching mathematics concepts to all students and may particularly benefit students who have MDs.

These strategies can also be considered as differentiating instruction or adaptations, depending on how they are used. If a particular strategy is essential to supporting the needs of a specific student, it should be documented as an adaptation in the student's IEP so that this information can follow the student to other classes and schools. (Refer to the [Student-Specific Assessment](#) section for further information.)

- **Teach students how to use a calculator for classwork and homework:** For example, when doing a calculation such as  $145 \times 32$ , a student can estimate  $100 \times 30$  as a low answer and  $200 \times 30$  as a high answer. Then, the student can check the calculator and should expect an answer greater than 3000 but less than 6000. Students with mathematics disabilities, should still be encouraged to use "easier facts" like multiples of 10 to estimate answers. They shouldn't just "trust" the calculator. Students must understand basic math skills when solving problems and when learning new concepts. As such, students using a calculator in class may need a periodic review of how to perform basic math skills to continue to develop their number sense.

- **Use graph paper for place value instruction:** Students can use graph paper to separate the places and decimal (ones, tens, hundreds, thousands; one-tenth, one-hundredth, one-thousandth); this helps students keep columns straight and reduce the likelihood of errors.
- **Use notebook paper to model appropriate spacing of math problems:** Turn notebook paper 90 degrees to help students organize math problems and line up numbers; when the paper is turned sideways, the student can write numbers between vertical lines. Show the student how to write a few problems correctly.
- **Use graphic organizers:** Graphic organizers can help students demonstrate, draw, or explain their thinking in math. Students can explore different ways of thinking about concepts by using strategies such as comparing and contrasting, a 3-point approach to vocabulary. (See [Appendix 5-C](#).)

For examples of graphic organizers that can be used in mathematics courses, see the following documents:

Manitoba Education and Training. *Success for All Learners: A Handbook on Differentiating Instruction*. Winnipeg, Manitoba: Manitoba Education and Training, 1996. p. 6.36. This document is available for purchase from the Manitoba Learning Resource Centre (formerly the Manitoba Text Book Bureau).

Zike, Dinah. Foldables. [www.dinah.com/](http://www.dinah.com/).

- **Use informative posters in the classroom:** Posters can provide visual reminders of important mathematical facts or concepts. The more interesting and novel the illustrations, the more likely students are to remember the information.
- **Use colour to highlight key facts:** Ask students to highlight key mathematics operations or issues *before* beginning work on mathematics problems. For instance, highlight each time the signs change. For geometry problems, ask them to highlight perimeter, area, or volume, as well as the name of the shape (e.g., triangle, square, trapezoid). Use different coloured highlighters to differentiate information.
- **Provide an extra textbook at home:** Students with LD and ADD/ADHD may tend to forget their books. Since mathematics can be one of their most challenging subjects, the possibility of successful learning depends on frequent opportunities to practise curricular outcomes. Missing opportunities for practise because of forgotten books can make a difference in a student's success.
- **List strategy or action words and the associated mathematics procedures:**
  - Encourage students to develop their own list and create a graphic organizer or foldable.
  - Create a wall poster wall for students—much like a word wall.



- Make it clear that memorization is not required.

*Example*

What operation would you use?

Sometimes, the terms in word problems such as “combined”, “what amount,” or “how much less” can confuse students with regard to deciding which mathematics procedures to use. (See the mathematical language section in the Mathematics Curriculum at [www.edu.gov.mb.ca/k12/cur/math/index.html](http://www.edu.gov.mb.ca/k12/cur/math/index.html).)

## ● Supporting Students with Mathematics Disabilities through Assistive Technology (AT)

In Marian Small’s book, “Making Math Meaningful to Canadian Students, K-8”, educators are provided with abundant examples of how to infuse technology into mathematics learning for students. Assistive technology can be considered as differentiating instruction or adaptations, depending upon how the AT is used. If a particular type of AT is essential to supporting the needs of a specific student, it should be documented as an adaptation in the student’s IEP so that this information can follow the student to other classes and schools. (Refer to the [Student-Specific Assessment](#) section for further information.)

- **Calculators:** Calculators can be used for exploring patterns which involve addition, subtraction, multiplication, division, and algebraic functions.

The National Council of Teachers of Mathematics (NCTM) has made specific recommendations on calculators used in school Mathematics courses including the following:

- All students should have access to calculators to explore mathematical ideas and experiences, to develop and reinforce skills, to support problem-solving activities, and to perform calculations and manipulations.
- Mathematics teachers at all levels should promote the appropriate use of calculators to enhance instruction by modeling calculator applications, by using calculators in instructional settings, by integrating calculator use in assessment and evaluation, by remaining current with state-of-the-art calculator technology, and by considering new applications of calculators to enhance the study and the learning of mathematics.

Further information is available at Government of Newfoundland and Labrador Department of Education: Division of Program Development: Calculators in Mathematics Instruction and Assessment: A Position Statement. 2004. 3. [www.ed.gov.nl.ca/edu/k12/curriculum/documents/mathematics/CalculatorsinInstruction.PDF](http://www.ed.gov.nl.ca/edu/k12/curriculum/documents/mathematics/CalculatorsinInstruction.PDF).

- **Computers:** There are many software programs available that increase conceptual learning of specific mathematics concepts (see *10 Tips for Software Selection for Math Instruction* at [www.ldonline.org/article/6243/](http://www.ldonline.org/article/6243/)).

- **Interactive Whiteboard:** This is an instructional tool that allows computer images to be displayed onto a board using a digital projector. The teachers can then manipulate the elements on the board by using their fingers as a mouse, directly on the screen. Items can be dragged, clicked, and copied and the teacher can handwrite notes, which can be transformed into text and saved (see *Interactive Math Websites for Interactive Whiteboards* at [www.theteachersguide.com/InteractiveSitesMathSmartBoard.htm](http://www.theteachersguide.com/InteractiveSitesMathSmartBoard.htm)).

There are countless websites which provide support to teachers and students in the area of Mathematics. The following is a list of some of the resources available:

- Math/LD Online at [www.ldonline.org](http://www.ldonline.org);
- Infusing Assistive Technology for Learning into the IPP Process at <https://archive.education.alberta.ca/>;
- Khan Academy at <https://www.khanacademy.org/>;
- DragonBox—Discover the Game of Math at [www.dragonboxapp.com/](http://www.dragonboxapp.com/);
- Meaningful Algebra with CAS—Compass Learning Technologies at [www.compasstech.com.au/ARNOLD/MAC/index.html](http://www.compasstech.com.au/ARNOLD/MAC/index.html).

In addition, you may find the following ‘search terms’ helpful in locating further websites that provide support to teachers and students in Mathematics:

addition, algebra, algorithm, angles, area, assistive technology, base ten, capacity, data collection, decimals, division, fraction, geometry, graphical representation, length, learn money, multiplication, number relationship, percentage, problem solving, shape and property, subtraction, telling time

## ● Supporting Students with Mathematics Disabilities through Adaptations to Formative and Summative Assessment

As in the previous sections, some of these strategies can also be considered as differentiated instruction or as adaptations, depending on how they are used. As in the use of differentiated instruction, adaptations should be made available to all the students in the classroom. Certain adaptations will be essential for certain students. These must be documented in the students’ IEPs. Adaptations offered during formative or summative assessments should be the same adaptations that the students use throughout the semester or school year. It is important to keep in mind that the adaptation(s) should not affect the validity of the assessment.

If a particular strategy is essential to supporting the needs of a specific student, it should be documented as an adaptation in the student’s IEP so that this information can follow the student to other classes and schools (refer to the [Student-Specific Assessment](#) section for further information).

- **Share outcomes, criteria, and learning goals with students.** Identify the outcomes related to each assessment so that students understand expectations, as well as their strengths and learning needs.
- **Allow students to refer to formulas, definitions, and key mathematics facts during tests.** Students could also be allowed the use of a mathematics dictionary that they create and use when doing work. Examples of summary sheets, which allow students to create one-page review summaries of notes, formulas, or definitions, are located in the Foldables book by Dinah Zike at [www.dinah.com/](http://www.dinah.com/). Similarly, students can use “word banks” or laminated cards with formulas, definitions, and/or key mathematics facts. This method is already used in provincial tests to assess the application of concepts rather than the recall of facts. Students must understand concepts in order to know which formulas to use; therefore, the validity of the assessment is not impacted.
- **Laminate a copy of important mathematics facts.** Make wallet-sized copies of multiplication tables and divisibility rules and allow students to keep them and use them when a calculator is not permitted or available. Also allow students to keep small cards with formulas or acronyms. Pictorial representation of the facts could be laminated and displayed as well.
- **Provide options for students to demonstrate learning.** Instead of written tests, students can demonstrate learning through interviews, models, discussions, presentations, graphic organizers, and so forth.
- **Read the questions to the student out loud.**
- **Allow extended time for tests.**
- **Allow students opportunities to rewrite tests.**
- **Shorten homework assignments.** Assign every second, third, or fourth mathematics problem that still covers the skills required for mastering major mathematics concepts.

For more information, see Manitoba Education and Advanced Learning, *Policies and Procedures for Provincial Tests*. Winnipeg, MB: Manitoba Education and Advanced Learning. Available online at [www.edu.gov.mb.ca/k12/assess/docs/pol\\_proc/](http://www.edu.gov.mb.ca/k12/assess/docs/pol_proc/).

#### Adaptations to Provincial Tests

##### 3.3.1 Procedures for Requesting Adaptations

Requests for adaptations are made at the time of registration when entering student data using the web application (*Provincial Test Student Registration*). Adaptations must be requested separately for each student for each test. (Manitoba Education and Advanced Learning) [www.edu.gov.mb.ca/k12/asses/docs/pol\\_proc/](http://www.edu.gov.mb.ca/k12/asses/docs/pol_proc/).

## Module Summary

A student with a mathematics disability can achieve a high level of success at school. Teachers must understand that a mathematics disability is a neurological disorder and, as such, provide students with direct/explicit instruction, along with strategy instruction, and time to practice skills to mastery. Students with mathematics disabilities face many challenges; however, with appropriate interventions and adaptations, they can become independent with their mathematics skills and have the same opportunities as their peers.

## References

- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Fourth edition, text revision. Washington, DC: American Psychiatric Association, 2000.
- . *Diagnostic and Statistical Manual of Mental Disorders*, Fifth edition, text revision. Arlington, VA: American Psychiatric Association, 2013.
- Krulik, S., and J.A. Rudnock. *Roads to Reasoning, Developing Thinking Skills Through Problem Solving*, McGraw-Hill Ryerson, 2004.
- Manitoba Education. *Grade 7 Mathematics: Support Document for Teachers*. Winnipeg, MB: Manitoba Education, 2012. [www.edu.gov.mb.ca/k12/cur/math/support\\_gr7/](http://www.edu.gov.mb.ca/k12/cur/math/support_gr7/).
- Manitoba Education and Advanced Learning. *Policies and Procedures for Provincial Tests*. Winnipeg, Manitoba: Manitoba Education and Advanced Learning. [www.edu.gov.mb.ca/k12/assess/docs/pol\\_proc/](http://www.edu.gov.mb.ca/k12/assess/docs/pol_proc/).
- Manzano, Robert J., Jennifer S. Norford, Diane E. Paynter, Debra J. Pickering, and Barbara B. Gaddy. *A handbook for Classroom Instruction that Works*. Alexandria, VA: Association for Supervision and Curriculum Development, 2001.
- Small, Marian. *Making Math Meaningful to Canadian Students, K-8*, 2nd edition. Toronto, Ontario: Nelson Education Ltd., 2013.
- Thomas, Edward J., and John R. Brunsting. *Styles and Strategies for Teaching Middle Grades Mathematics*. Thousand Oaks, California: Corwin, 2010.
- Van de Walle, John A., Karen S. Karp, Jennifer M. Bay-Williams, Lynn M. McGarvey, and Sandra Folk. *Elementary and Middle School Mathematics, Teaching Developmentally*, 4th edition. Reading, MA: Addison Wesley Longman, Inc., 2001.
- Van de Walle, John A., Karen S. Karp, LouAnn H. Lovin, and Jennifer M. Bay-Williams. *Teaching Student-Centered Mathematics, Developmentally Appropriate instruction for grades 3-5*, Second Edition, Boston, MA: Pearson, 2014.

## Resources

Dacey, Linda, and Rebeca Eston Salemi. *Math for All: Differentiating Instruction, Grades 6-8*. Math Solutions Publications, 2007. [www.pearsoncanadaschool.com/index.cfm?locator=PS1zOt&PMDBSOLUTIONID=25862&PMDBSITEID=2621&PMDBCATEGORYID=25876&PMDBSUBSOLUTIONID=&PMDBSUBJECTAREAID=&PMDBSUBCATEGORYID=26215&PMDBProgramID=53801&elementType=programComponents](http://www.pearsoncanadaschool.com/index.cfm?locator=PS1zOt&PMDBSOLUTIONID=25862&PMDBSITEID=2621&PMDBCATEGORYID=25876&PMDBSUBSOLUTIONID=&PMDBSUBJECTAREAID=&PMDBSUBCATEGORYID=26215&PMDBProgramID=53801&elementType=programComponents).

This book offers practical, research-based guidance to differentiating instruction in the mathematics classroom.

——. *Math for All: Differentiating Instruction, Grades K-2*. Math Solutions Publications, 2007.

This book offers practical, research-based guidance to differentiating instruction in the mathematics classroom.

Murray, Miki, and Jennifer Jorgensen. *Differentiated Math Classroom, A Guide for Teachers, K-8*. Heinemann, 2007. [www.pearsoncanadaschool.com/index.cfm?locator=PS1zOt&PMDBSOLUTIONID=25862&PMDBSITEID=2621&PMDBCATEGORYID=25876&PMDBSUBSOLUTIONID=&PMDBSUBJECTAREAID=&PMDBSUBCATEGORYID=26215&PMDBProgramID=52822&elementType=programComponents](http://www.pearsoncanadaschool.com/index.cfm?locator=PS1zOt&PMDBSOLUTIONID=25862&PMDBSITEID=2621&PMDBCATEGORYID=25876&PMDBSUBSOLUTIONID=&PMDBSUBJECTAREAID=&PMDBSUBCATEGORYID=26215&PMDBProgramID=52822&elementType=programComponents).

This resource describes both the big ideas of differentiation and the day-to-day teaching that makes it work.

Small, Marian. *Eyes on Math: A Visual Approach to Teaching Math Concepts*. New York, NY: Teachers College Press, 2013. [www.nelsonschoolcentral.com/CGI-BIN/lansaweb?webapp=WKWSEARCH+webtrn=search+ml=LANSA:XHTML+partition=CEP+language=ENG](http://www.nelsonschoolcentral.com/CGI-BIN/lansaweb?webapp=WKWSEARCH+webtrn=search+ml=LANSA:XHTML+partition=CEP+language=ENG).

This resource shows how to use images to stimulate mathematical teaching conversations around K-8 Mathematics concepts.

——. *Good Questions: Great Ways to Differentiate Mathematics Instruction*, 2nd edition. New York, NY: Teachers College Press, 2012. [www.nelsonschoolcentral.com/cgi-bin/lansaweb?webapp=WBOOKCMP+webtrn=bookcomp+F\(LW3ITEMCD\)=9780807753132](http://www.nelsonschoolcentral.com/cgi-bin/lansaweb?webapp=WBOOKCMP+webtrn=bookcomp+F(LW3ITEMCD)=9780807753132).

This resource provides clear, ready-to-use ideas for differentiating instruction in mathematics.

——. *Leaps and Bounds Toward Math Understanding: Teacher's Resource, 3-4*. Toronto, Canada: Nelson Education Ltd., 2011.

——. *Leaps and Bounds Toward Math Understanding: Teacher's Resource, 5-6*. Toronto, Canada: Nelson Education Ltd., 2011.

This resource help teachers support students who are struggling in mathematics.

—. *Leaps and Bounds Toward Math Understanding: Teacher's Resource, 7-8*. Toronto, Canada: Nelson Education Ltd., 2011. [www.nelsonschoolcentral.com/cgi-bin/lansaweb?webapp=WBOOKCMP+webtrn=bookcomp+F\(LW3ITEMCD\)=9780176351526](http://www.nelsonschoolcentral.com/cgi-bin/lansaweb?webapp=WBOOKCMP+webtrn=bookcomp+F(LW3ITEMCD)=9780176351526).

—. *More Good Questions*. Toronto, Canada: Nelson Education Ltd., 2010. [www.nelsonschoolcentral.com/CGI-BIN/lansaweb?webapp=WKWSEARCH+webtrn=search+ml=LANSAXHTML+partition=CEP+language=ENG](http://www.nelsonschoolcentral.com/CGI-BIN/lansaweb?webapp=WKWSEARCH+webtrn=search+ml=LANSAXHTML+partition=CEP+language=ENG).

Specifically for secondary mathematics teachers, presents two powerful and universal strategies that teachers can use to differentiate instruction across all mathematics content.

—. *Uncomplicating Algebra*. Toronto, Canada: Nelson Education Ltd., 2014. [www.nelsonschoolcentral.com/cgi-bin/lansaweb?webapp=WBOOKCMP+webtrn=bookcomp+F\(LW3ITEMCD\)=9780807755174](http://www.nelsonschoolcentral.com/cgi-bin/lansaweb?webapp=WBOOKCMP+webtrn=bookcomp+F(LW3ITEMCD)=9780807755174).

This resource helps teachers understand how to teach and assess student learning of algebra.

Thomas, Ed, Ph.D. *Dr. Thomas' P3CR Paired Learner Math Activities for General Math, Pre-Algebra, Algebra, and Geometry*. Woodbridge, NJ: Dimension 2000, 1999.

# Appendix 5-A

## Pictorial examples

### Array or area model

#### a) Multiplication

When a student makes an error in performing a multiplication task, it most likely stems from a lack of understanding of the underlying principal, such as numeration and multiplication. When a student continues to make these kinds of errors and doesn't seem to understand what they are doing wrong they should be using concrete examples, such as the one below, to record the written algorithms. (Small, 2009)

Here is an example of increasing levels of abstraction using the concept of multiplication. It shows the progression from concrete to pictorial to symbolic.

Figure 4 **Pictorial Example of Multiplication**

1)  $56 \times 38 =$

Begin by building this concretely with base ten blocks, then move to pictorial representation as illustrated below.

	50	6
30	1500	180
8	400	48

$$56 \times 38 = 1500 + 180 + 400 + 48 = 2128$$

Now move to symbolic representation as shown below.

$$\begin{array}{r} 56 \\ \times 38 \\ \hline 1500 \\ 400 \\ 180 \\ \hline +48 \\ \hline 2128 \end{array}$$

If students are ready, they can progress to the standard algorithm, which is just a shortcut of the above.

$$\begin{array}{r} 56 \\ \times 38 \\ \hline 1900 \\ \hline +228 \\ \hline 2128 \end{array}$$

1)  $(2x+3)(x+2) =$

Using algebra tiles...

	x	x	3
x	$x^2$	$x^2$	$3x$
2	$2x$	$2x$	6

$$2x^2 + 7x + 6$$

## b) Algebraic Equations

Explain to students that an equation is like a balance scale. If the same number is subtracted from each side, for example, the equation remains balanced. Whatever students do to one side of an equation (e.g., add, subtract, multiply, divide) they must do to the other side of the equation.

An actual balance scale can be used to demonstrate this in a concrete way. The following illustration shows a pictorial representation of the concept.

Figure 5 Algebraic Equations

Example:

Represent  $2n + 3 = 11$  as a balance.

● represents a chip.

□ represents a tag containing an unknown number of chips.

$$2n + 3 = 11$$

Show this concretely (or pictorially).

$$2n + 3 = 11$$

$$-3 \quad -3$$

Maintaining balance, remove 3 chips from each side.

$$2n = 8$$

Simplify.

$$\frac{2n}{2} = \frac{8}{2}$$

Determine the number of chips that would be in each bag.

$$n = 4$$

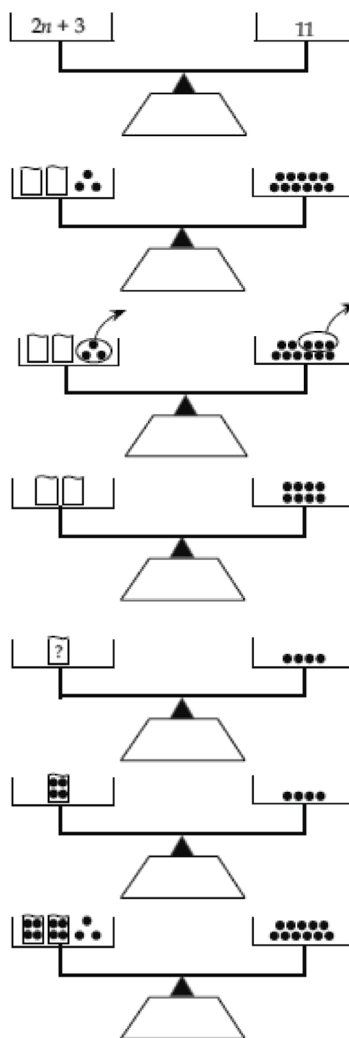
Simplify.

$$2n + 3 = 11 \quad (?)$$

$$8 + 3 = 11 \quad (?)$$

$$11 = 11 \quad (✓)$$

Check.



Source: Manitoba Education. *Grade 7 Mathematics: Support Document for Teachers*. Winnipeg, Manitoba: Manitoba Education. 2012. 19. [www.edu.gov.mb.ca/k12/cur/math/support\\_gr7/patterns.pdf](http://www.edu.gov.mb.ca/k12/cur/math/support_gr7/patterns.pdf).



# Appendix 5-B

## Mnenomics

### a) Order of Operations

VandeWalle, 2001, states that “*Operations*” refers to adding, subtracting, multiplying, dividing, squaring, etc.

But, when you see something like ...

$$7 + (6 \times 52 + 3)$$

... a student asks themselves, “what part should I calculate first?”

Start at the left and go to the right?

Or go from right to left?

VandeWalle warns that “*if you calculate them in the wrong order, you will get a wrong answer!*”

For this very reason, people agreed to follow rules when doing calculations.

These rules are

**Do things in brackets first.** For example,

$$\checkmark \quad 6 \times (5 + 3) = 6 \times 8 = 48$$

$$\times \quad 6 \times (5 + 3) = 30 + 3 = 33 \text{ (wrong)}$$

**Calculate Exponents (Powers, Roots) before multiplying, dividing, adding, or subtracting.** For example,

$$\checkmark \quad 5 \times 2^2 = 5 \times 4 = 20$$

$$\times \quad 5 \times 2^2 = 10^2 = 100 \text{ (wrong)}$$

**Multiply or divide before adding or subtracting.** For example,

$$\checkmark \quad 2 + 5 \times 3 = 2 + 15 = 17$$

$$\times \quad 2 + 5 \times 3 = 7 \times 3 = 21 \text{ (wrong)}$$

**Otherwise just go left to right.** For example,

$$\checkmark \quad 30 \div 5 \times 3 = 6 \times 3 = 18$$

$$\times \quad 30 \div 5 \times 3 = 30 \div 15 = 2 \text{ (wrong)}$$

- B**      **B**rackets first
- E**      **E**xponents (i.e., powers, square roots, etc.)
- MD**    **M**ultiplication and **D**ivision (left-to-right)
- AS**    **A**ddition and **S**ubtraction (left-to-right)

### b) Properties of Whole Numbers

There are five common properties of whole numbers, two of which—the Communicative Property (CO) and the Associative Property (AP)— are often confusing for students. Mnemonics can help students differentiate between the two.

Communicative Property (CO) applies

- To addition and multiplication
- Even though the order changes
- Even though the sum or product is still the same

CO allows a change in order in numbers.

- $5 + 7 = 7 + 5$
- $A + b = b + a$
- $3 \times 7 = 7 \times 3$

Associative Property (AP) of addition applies

- Even though the parentheses move
- Even though (the grouping of numbers changes) the sum is still the same

AP arranges parentheses

- $(12 + 8) + 5 = 12 + (8 + 5)$
- $(3X + 2) + 2X = 3X + (2 + 2X)$

### c) Linear Equations

Linear functions are described by both a formula and a line drawing on a graph. Typically students have problems with two special cases: a case where the line has no slope (vertical line) and a case where the line has a 0 slope (horizontal line). Students can make up their own mnemonics to help them understand their difficulties in linear equations.

An example of a mnemonic created by a high school senior is the acronym **HOY**.

- Slope of Horizontal Line: **HOY** – **H**orizontal, **0** slope, **Y**=?

Example: A **H**orizontal line has a slope of 0 and is represented by an equation,  $Y = a$  constant.

If you know the mnemonic **HOY**, it is easier to remember that a vertical line has no slope and is represented by an equation  $x = a$  constant.

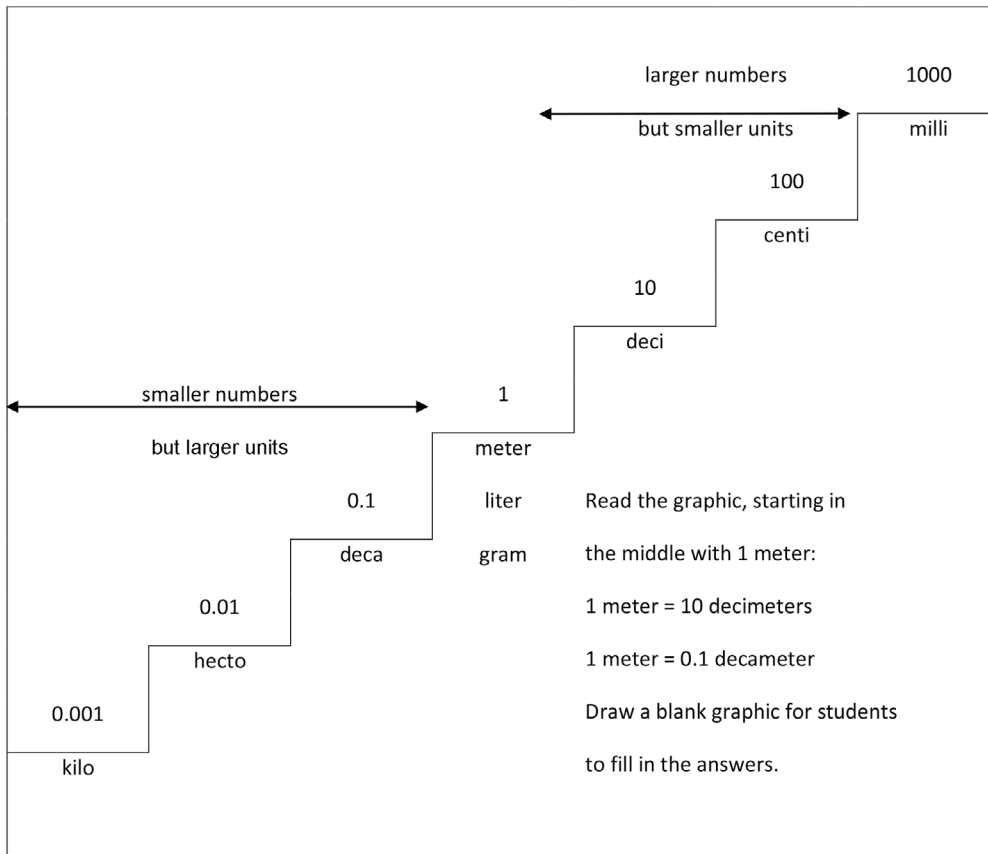
# Appendix 5-C

## Metric System Graphic Organizer

Students can use the following “staircase” graphic organizer to help them see and remember the relationship of prefixes in the metric system.

Figure 6

### Metric System Graphic Organizer



# Appendix 5-D

## Strategies in Supporting Students with Mathematical Disabilities

The following are two useful strategies in supporting students with mathematical disabilities, as well as all other students. These examples happen to use early years scenarios; however, the strategies can be used in middle and senior years as well.

### What Questions Can You Answer?

This is an example where numerical data are provided. Students generate a list of questions that can be answered from the data and then answer at least one of their questions.

Figure 7

### Maya's Toys

Maya has a box of toys. Each toy is different. Maya sorts them into 3 groups.



Write three questions you can answer about the groups.

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Find the answer to one of your questions. Show your work.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## What Number Makes Sense?

This is an example of a problem situation from which numerical data are missing. Students choose from a list of numbers to fill in the blanks so that the problem and solution make sense.

Figure 8

### Football Points

Yan played 2 football games last week. In the first game Yan's team scored \_\_\_\_\_ points. In the second game Yan's team scored \_\_\_\_\_ more points than in the first game. Altogether Yan's team scored \_\_\_\_\_ points in 2 games.

6	48	21
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1. Read the problem.
2. Look at the numbers in the box.
3. Put the numbers where you think they fit best.
4. Read the problem again. Do the numbers make sense?
5. Explain how you know you have the numbers in the correct blanks.

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# Module 6

Supporting Students with  
 *Nonverbal  
Learning  
Disabilities*

This module provides information about the characteristics of students with nonverbal learning disabilities (NLD) along with the interventions and adaptations to support their learning.

## ● Key Ideas in this Module

- A nonverbal learning disability (NLD) can be difficult to identify and easy to overlook.
- Common characteristics of a NLD include rote verbal strengths, nonverbal challenges, and difficulty with mathematics, reading comprehension, and interpersonal and social skills.
- The verbal strengths of students with NLD can be used to help them learn how to understand and manage daily activities.
- Effective interventions for NLD include direct instruction, strategy instruction, and appropriate adaptations.

## ● Key Terminology

- **Comorbidity** refers to the presence of more than one mental health diagnosis occurring in an individual at the same time.
- **Neuropsychology** is the branch of psychology that deals with the relationship between the nervous system, especially the brain, and mental functions such as language, memory, and perception.
- The **right-hemispheric function** is the part of the brain that processes non-verbal, performance-based information including visual-spatial, organizational, and evaluative processing functions.
- A **syndrome** is a group of symptoms that consistently occur together or a condition characterized by a group of associated symptoms.

## ● What is a Nonverbal Learning Disability?

NLD is a syndrome characterized by a pattern of strengths and challenges thought to be due to dysfunction in the right hemisphere of the brain. It is not recognized as a formal diagnosis with agreed-upon diagnostic criteria. Educators do not need a diagnosis, however, to address the difficulties of NLD. Educators can implement interventions and adaptations as soon as they become concerned about a student's learning progress.

NLD affects nonverbal learning. Nonverbal or visual information processing skills are more specific to the right brain and rely on the gathering and synthesizing of information



from many sensory sources simultaneously. Dysfunction in the right hemisphere of the brain causes an inability to take these multiple pieces of information and put them together to form a single integrated picture.

Because the challenges of NLD may be profound or mild, different students display different characteristics. The disorder does not change over time; however, as the demands for abstract reasoning and deeper understanding increase in upper early years and in senior years, the severity of the disorder may become more pronounced. NLD is neurologically based, which means it is life-long.

NLD is a syndrome that is often misunderstood, misdiagnosed, or missed. Identification is further complicated by the fact that the symptoms of NLD are similar to those of other disorders, such as attention deficit hyperactivity disorder (ADHD), mathematics disorder (MD), and autism spectrum disorder (ASD). It is also important to remember that more than one disorder can occur at the same time (comorbidity).

- **NLD vs. ADHD:** Students with NLD display less impulsivity and greater problems with interpersonal and social skills (and earlier onset) than students with ADHD. Students with NLD also have more problems with mathematics and reading comprehension, and are more likely to internalize stress leading to anxiety or depression. Students with NLD often have difficulty maintaining attention to tactile and visual stimuli. Because much of the teaching in the early years is visual and requires hands-on (tactile) exercises, these students' difficulties are often misinterpreted as a primary failure in attention.
- **NLD vs. MD:** Students with NLD have more problems with interpersonal relations, social skills, organization, and conceptual thinking than students with MD.
- **NLD vs. ASD:** Student's with NLD do not have the same difficulties with symbolic play, obsessions, repetitive behaviour, and emotional lability (mood changes) as students with ASD.

## ● Characteristics of a Student with a Nonverbal Learning Disability and Strategies for Supporting Them

NLD can be difficult to identify because of the range of areas impacted and the similarity to other conditions. In this document, the strengths and challenges faced by a student with NLD are presented in four general categories.

1. Verbal functioning
2. Nonverbal functioning
3. Academic functioning
4. Social/Emotional Functioning

## ● Supporting Verbal Functioning in a Student with a Nonverbal Learning Disability

Strong language skills are often equated with competence. The high volume of speech output, well-developed vocabulary, and word-recognition skills demonstrated by a student with NLD often leads people to overestimate their ability. They may be able to recall an excessive number of facts and details and to repeat verbatim segments of text; however, their speech contains little in the way of meaningful content and tends to be straightforward, repetitive, and rote.

Until we give it meaning, language is simply an array of letters and sounds. Meaning is comprised of the literal meaning of words and often a visual association or sense of what that word conveys. Without being able to create a visual representation, students with NLD store language in memory as discrete units of information in a literal and concrete manner. There is no visual or emotional sense of meaning attached. This affects the student's ability to comprehend the deeper and more integrated function of language.

Additionally, much of our interpersonal and social communication depends on our ability to understand not only what is being said but also the intent or the meaning behind what is being said. We rely on subtle nonverbal cues to help us understand the intended meaning. For example, if someone says 'just a minute', we understand they will be with us shortly. For a student with NLD this means exactly 60 seconds.

Because students with NLD are unable to recognize nonverbal aspects of conversation, they are also unable to replicate them. This leads to their speech having a stilted quality and their conversation can often be inappropriate for the situation. This limits the ability of students with NLD to interact socially, engage in meaningful conversation, enjoy humour, recognize sarcasm, and understand the 'nuances' of language.

Educators can support the verbal functioning of students with NLD by:

- Teaching them to use their verbal strengths to understand their own experiences.
- Providing verbal mediation (talk their way through) for nonverbal experiences, including their interactions with others when appropriate.
- Teaching them to watch for and interpret indications from others that they may be talking too much or that their communication is ineffective in some other way.

## ● Supporting Nonverbal Functioning in a Student with a Nonverbal Learning Disability

The inability to process and integrate multiple pieces of nonverbal information affects students with NLD in a number of ways. It limits their ability to recognize patterns and make connections based on similarities and differences. This impedes understanding of cause and effect, prediction, generalization, discovery learning, trial and error learning, problem solving, flexible thinking (adapting to new by connecting with known), and critical thinking.

Teachers may find that students with NLD work well within established routines but have difficulty when adapting to new situations or novel material. Adaptation is the ability to change behaviour in response to sensory feedback from the environment. Because students with NLD are limited in their ability to understand and integrate information entering through multiple sensory channels simultaneously, there is a tendency to over rely on rote and previously learned behaviours. New experiences, such as unexpected activities or encountering a substitute teacher, can create anxiety for students with NLD as they lack the necessary skills to adapt to change.

Perceptual-visual difficulties make it difficult for students with NLD to visualize problems in order to solve them. For example, a mechanic may be able to visualize a problem with an engine but not be able to put it into words. The opposite is true of a student with NLD: the student is able to describe things but cannot visualize the problem.

For many students with NLD a lack of gross motor coordination can lead to social rejection as they “get in the way”, bump into people and objects, and are generally unaware of the way their body occupies space. Others may be well coordinated but struggle in team sport situations where there is continuous, complex, multi-sensory information that needs to be processed.

As the concept and sense of time involves the integration and coordination of different kinds of information from different sensory input, students with NLD tend to “be out of time.” They have difficulty estimating the time it takes to complete tasks, have trouble reading an analog clock, and struggle with planning and organizing.

Educators can support the nonverbal functioning of students with NLD. Educators can:

- Teach students to interpret nonverbal cues such as facial expressions and gestures.
- Teach and practise organization; provide verbal cues to help with organization; allow extra time.
- Help students cope with their lack of visual-spatial orientation and directional concepts by planning out daily activities and providing students with a written copy.
- Prepare students for changes in routine and transitions by providing written schedules to the students and parents.
- Develop a plan to slowly increase students’ tolerance for the unknown; implement the plan in a safe and controlled manner, including teaching self-talk skills to help students manage novel situations.
- Have an occupational therapist provide sensory integration therapy to help normalize the reactions of sensory overload.
- Teach the connections between cause and effect relationships and help students find ways to anticipate these.
- Support generalization by using language to connect new situations to old learning.
- Avoid power struggles to deal with inappropriate behaviour; taking away privileges is not an effective strategy.

Teachers should:

- Provide direct instruction and guided practice as students are learning a new strategy.
- Gradually transfer responsibility for defining purpose and selecting strategies to the student.
- Provide monitoring and feedback.

## ● Supporting Academic Functioning in a Student with a Nonverbal Learning Disability

Students with NLD are slow to develop phonics skills but once developed they do well with word decoding, spelling, and memory for rote material. Verbatim memory for oral and written material may be outstanding. Often the student amasses a stockpile of factual information that is impressive for his or her chronological age. This can be misleading as we assume a deeper understanding accompanies these well-developed verbal skills. Because reading comprehension and higher-level abstract reasoning depend on integrating both the surface and deeper meaning of language, students with NLD often struggle in these areas. Their written compositions may be disorganized or consist of strung-together facts. They may be unable to draw conclusions or make inferences.

Mathematics is about the relationships between quantities, space, structure, and time. Learning mathematics is based on understanding patterns and relationships between these abstract concepts. Because of the challenges associated with non-verbal information processing, students with NLD typically struggle with most aspects of mathematics, including concepts of time, money skills, measurement, number alignment, mathematics signs, and spatial concepts. These students can follow step-by-step processes but have difficulty varying from established routines.

Students with NLD may have difficulty acquiring motor tasks such as handwriting, cutting with scissors, or tying shoelaces, but once mastered fluency is not an issue. Additionally, the challenges with visual spatial integration may lead to problems in geography (because of a difficulty with maps and graphs), in art, and in team sports.

Students with NLD are typically more academically successful in the early years where the demands for success are more rote and require less interpretation and integration of information. As they progress through the school years, they may need an IEP to support their learning through appropriate adaptations and may need support in developing coping skills to manage their daily stress.

Educators can support the general academic functioning of students with NLD. Educators can:

- Provide direct instruction in learning strategies.
- Provide access to and direct instruction in the use of appropriate assistive technology.
- Write out and number multi-step directions and break tasks into manageable segments.
- Break down and explain abstract ideas in detail that students can recall.

- Address students' excessive questions by explaining that there is only time to answer a specific number of questions right now (e.g., three) but that more can be answered later.
- Keep in mind that a student's vocabulary and recall of facts may give an exaggerated sense of competency (assess students level of understanding by having them rephrase information in their own words).
- Teach students how to use private speech to initiate, direct, or maintain behaviour.
- Teach students how to self-monitor to reduce symptoms of inattention and impulsive behaviour.
- Recommend adapted physical education with an emphasis on functional recreational activities (e.g., swimming, yoga, walking) and/or occupational therapy to enhance the perceptual and psychomotor skills necessary for group sports.
- Encourage individual sports like karate, or track and field.

Educators can support students with NLD through adaptations to assessment by providing:

- Opportunities to read aloud during tests;
- A scribe for tests;
- Additional time for assignments and tests.

## ● Supporting Specific Skills: Mathematical Reasoning

Mathematical reasoning skills include solving complex word problems, equations, graphing, relations, and functions. Educators can support these skills in students with NLD by providing:

- Strategies to make learning more concrete (e.g., use manipulative materials and break down word problems);
- Direct instruction in the use of strategies to break down complex solutions (e.g., use cue cards or formula sheets with step-by-step examples and sequential templates with multi-step solutions);
- Direct instruction in the use of strategies to enhance pattern recognition (e.g., use many examples of patterns for practise and estimate before problem-solving);
- Direct instruction in the use of strategies to enhance comprehension (e.g., create a mathematics vocabulary list, simplify terms when practising new problems, use a partner to generate ideas, create a file system for main sub-topics);
- Direct instruction in the use of Assistive Technology to free up mental energy for mathematics reasoning (e.g., calculator with auditory feedback—go to [www.ehow.com/print/about\\_7219521\\_assistive-technology-dyscalculia.html](http://www.ehow.com/print/about_7219521_assistive-technology-dyscalculia.html)—and calculator with printout);

- Direct instruction in the use of Assistive Technology for breaking down complex solutions ([http://en.wikibooks.org/wiki/Assistive\\_Technology\\_in\\_Education/Mathematics\\_Class](http://en.wikibooks.org/wiki/Assistive_Technology_in_Education/Mathematics_Class));
- Direct instruction in the use of Assistive Technology to make learning more concrete (e.g., virtual math websites).
  1. Cool Math Sites: [www.coolmath.com/teachers/](http://www.coolmath.com/teachers/).
  2. National Library of Virtual Manipulatives: <http://nlvm.usu.edu/en/nav/vlibrary.html>.

For additional information and strategies, please see [Module 5: Supporting Students with Mathematics Disabilities](#).

## ● Supporting Specific Skills: Mathematical Calculation

Mathematical calculation skills include computation, fractions, decimals, plotting, measurement, proportion, money, and percentages. Educators can support these skills in students with NLDs by providing:

- Strategies to make learning more hands-on, such as using concrete manipulatives, practising with real-life items (e.g., tape measures, measuring cups), practising examples that relate to students' real-life experiences, building models;
- Direct instruction in the use of strategies to breakdown complex solutions (e.g., cue cards or formula sheets with step-by-step examples);
- Direct instruction in the use of strategies for practising procedural memory (e.g., teachers typically model strategy use for students, the use of sequential templates for mapping multi-step directions, or the use of a key math fact legend that translates operations into words);
- Direct instruction in the use of strategies for creating organizational structures and self-monitoring (e.g., checking/re-checking calculations, graph paper to line up numbers, subdividing answer sheets into boxes, highlighting operational signs);
- Permission to use a calculator for tests;
- Permission to use a math vocabulary reference sheet for tests;
- Direct instruction in the use of assistive technology to provide support for memory (e.g., a calculator with a printer, a calculator with voice output, graphing calculators, calculating software) (see [www.nonverballearningdisabilities.wikispaces.com/2.+Instructional+Adaptations](http://www.nonverballearningdisabilities.wikispaces.com/2.+Instructional+Adaptations));
- Direct instruction in the use of assistive technology for creating organizational structures such as spread sheets, graphing/charting software, and graphing calculators (see [www.idonline.org/article/6114/](http://www.idonline.org/article/6114/));

- Direct instruction in the use of assistive technology for strengthening procedural memory, (e.g., mathematical software to drill basic operations, virtual math websites that show step-by-step problem solving) (see [www.disabilityissues.ca/english/Linkdocs/LDResour.pdf](http://www.disabilityissues.ca/english/Linkdocs/LDResour.pdf)).

For additional information and strategies, go to [Module 5](#): Supporting Students with Mathematics Disabilities.

## ● Supporting Specific Skills: Reading Comprehension

Reading comprehension involves the ability to form visual pictures of what is read to create a 'whole picture', linking new information with previous knowledge, identifying main ideas, inferring meaning, and summarizing. Educators can support comprehension in students with NLDs by providing:

- Direct instruction in the use of strategies for identifying main ideas (e.g., underlining/highlighting key words, using a graphic organizer to track information and create overview, asking questions to highlight key information, summarizing key points);
- Direct instruction in the use of strategies for making the reading process more active (e.g., reading aloud, previewing and questioning, using chapter summary notes or study guides);
- Direct instruction in the use of assistive technology for identifying main ideas; text-to-speech software with highlighting features: (see [www.donjohnston.com/products/read\\_outloud/](http://www.donjohnston.com/products/read_outloud/), [www.texthelp.com/](http://www.texthelp.com/), [www.kurzweiled.com/](http://www.kurzweiled.com/), [www.freedomscientific.com/lsg/products/wynn.asp](http://www.freedomscientific.com/lsg/products/wynn.asp)).

For additional information and strategies, please see [Module 3](#): Supporting Students with Reading Disabilities.

## ● Supporting Specific Skills: Written Expression

Written expression involves the abilities to brainstorm, plan, and organize ideas. Educators can support written expression in students with NLDs by providing:

- Direct instruction in the use of strategies for organizing and planning written work (e.g., using templates and samples, creating outlines, mind mapping, using a partner to generate initial ideas, etc.);
- Direct instruction in the use of a system for organizing topics and supporting topics (graphic organizers);
- Direct instruction in the use of assistive technology for planning and organizing written work; organizational software for mind maps (see [www.donjohnston.com/products/draft\\_builder/](http://www.donjohnston.com/products/draft_builder/), and [www.inspiration.com/](http://www.inspiration.com/));

- Direct instruction in the use of assistive technology for the initial generation of ideas (e.g., recording device, voice recognition) (see [www.inspiration.com/](http://www.inspiration.com/), [www.donjohnston.com/products/draft\\_builder/](http://www.donjohnston.com/products/draft_builder/), [www.nuance.com/dragon/index.htm](http://www.nuance.com/dragon/index.htm), and [www.gogsoftware.com/](http://www.gogsoftware.com/));
- Direct instruction in the use of an assignment calculator to break down large projects into manageable tasks (see [www.lib.umn.edu/help/calculator/](http://www.lib.umn.edu/help/calculator/) and <http://apps.library.ryerson.ca/assignment-calculator/>).

For additional information and strategies, please see [Module 4](#): Supporting Students with Learning Disabilities in Written Expression.

## ● Supporting Specific Skills: Handwriting

Handwriting involves spatial-organizational fine motor activity. Educators can support handwriting in students with NLDs by:

- Providing direct instruction in the use of strategies for completing written work (e.g., provide templates with a limited number of well-spaced prompts; provide teacher prepared lecture guides to minimize the need for note taking);
- Providing assistance with folding, cutting with scissors, arranging material in a visual-spatial manner (maps, graphs, mobiles, etc.);

Providing direct instruction in the use of assistive technology for production of written work (e.g., text-to-speech software) (see [www.donjohnston.com/products/write\\_outloud/index.html](http://www.donjohnston.com/products/write_outloud/index.html), [www.inspiration.com/](http://www.inspiration.com/), [www.donjohnston.com/products/draft\\_builder/index.html](http://www.donjohnston.com/products/draft_builder/index.html), [www.nuance.com/dragon/index.htm](http://www.nuance.com/dragon/index.htm), and [www.gogsoftware.com/](http://www.gogsoftware.com/));

- Using multiple-choice questions rather than essay questions when testing content knowledge.

For additional information and strategies, please see:

- [Module 4](#): Supporting Students with Learning Disabilities in Written Expression.
- *Success for All Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools* is a handbook on differentiating instruction and a support document released by Manitoba Education and Advanced Learning which provides blackline masters to support reading and writing across the curriculum. It is available at [www.edu.gov.mb.ca/k12/cur/elements.html](http://www.edu.gov.mb.ca/k12/cur/elements.html).



## ● Supporting Social-Emotional Functioning in a Student with a Nonverbal Learning Disability

Research has shown that more than 65% of the intent of average conversation is conveyed non-verbally (e.g., tone of voice, facial expressions, body posture, etc.). For students with NLDs, who are unable to interpret non-verbal information, social functioning becomes a significant concern. Because their behaviour and verbal interaction style differ from their peers, they are frequently excluded, teased, or persecuted and do not understand why. Students with NLDs often have difficulty developing relationships and close personal attachments. This can lead to social isolation, withdrawal, low self-worth, and an increased risk for anxiety and depression (Rourke, 1989).

Life can be demanding and difficult for students with NLDs and most of the unusual behavioural responses typically seen represent an attempt at compensation. Students with NLDs want to learn, fit in, and succeed. Educators can help these students discover the ways in which they learn, address their challenges through explicit and direct instruction, support their learning needs, and help them utilize their strengths.

Educators can support the social/emotional functioning of students with NLDs by doing the following:

- Teach students relaxation skills to cope with anxiety.
- Help students to develop an understanding of NLDs.
- Provide direct instruction in social skills, such as making eye contact, greeting others, requesting assistance, respecting personal space, not interrupting others, and so forth.
- Provide direct instruction in functional perceptual skills such as reading facial expressions and understanding gestures.
- Create and use social stories and social scripting to help students make and keep friends.
- Explore the possibility of pragmatic language therapy (Speech and Language Pathologist) to address topic maintenance, verbal self-monitoring, and appropriate social communication.
- Educate others to understand and accept that some students may have difficulty making eye contact because of difficulty processing visual and auditory information at the same time.
- Arrange single-peer social activities rather than unstructured or group events.
- Provide direct instruction/explanation in understanding humour, sarcasm, and slang.

Be confident and hopeful;  
effective intervention can  
affect a positive difference.

## ● Reference

Rourke, B. P. *Nonverbal learning disabilities: The syndrome and the model*. New York, NY: Guilford Press, 1989.

# Module 7

## Supporting *Self-Advocacy*

and Success in Student

Learning



The goal of this module is to provide practical strategies and teaching tips that contribute to the development of self-advocacy for students with learning disabilities.

## ● Key Ideas in this Module

In this module we will:

- Explore benefits and barriers to self-advocacy.
- Learn how to support the students in understanding their learning disabilities.
- Recommend approaches that support student motivation/determination.
- Highlight the importance of parental involvement in a collaborative environment.
- Provide the names of organizations and a list of websites that provide information about learning disabilities.

## ● Benefits of Self-Advocacy

Studies have shown that highly successful adults with learning disabilities identify the ability to self-advocate as a contributing factor to success. To self-advocate is to take action on one's own behalf. Self-advocacy can lead to self-determination, which is the ability to consider one's options and make choices that affect one's future. Self-advocacy, therefore, can have a positive impact on the lives of students as well as adults with learning disabilities.

Students with learning disabilities must be able to advocate effectively for themselves. Beginning in the early years and continuing throughout their school lives, students with learning disabilities must be supported in learning how to self-advocate. They must learn strategies for problem solving and goal setting, become aware of their strengths and areas of need, understand and accept the implications of their learning disabilities, and take responsibility for self-advocacy. They require frequent opportunities to practise these skills in a positive, supportive environment.

When teachers, students, and student support teams are able to engage in the collaborative process of building self-advocacy skills, students can benefit in many ways.

- Students can learn to appropriately describe their abilities and needs as well as the assistance and adaptations they require to support their learning.
- Students can be actively involved in setting realistic goals for their education.
- Students who learn to self-advocate tend to stay in school longer, pursue post-secondary education, and become successful in the workplace.

## ● Barriers to Self-Advocacy

Students with learning disabilities may not self-advocate effectively for a number of reasons.

- They may lack knowledge of themselves as learners and have difficulty describing their abilities, their needs, and the conditions that best support their learning.
- They may not know who to speak with about obtaining assistance or adaptations, what to ask for, how to ask for it, or how to best utilize supports.
- They may lack the ability to articulate personal strengths and needs. This may be the result of difficulties with expressive language or social skills, or a lack of practise in communicating their needs.
- They may have limited confidence and low self-esteem. As a result, they may be reluctant to ask questions in class or ask for extra assistance. They may not want to be perceived as being “stupid” or a “trouble-maker”.
- They may be passive about their involvement in their education and feel that the future of their education is beyond their control. They may rely on parents and teachers to advocate for them.
- They may encounter people (at home, at school, in the community, in the workplace, and so on) who do not understand learning disabilities or why adaptations or assistance may be appropriate.

## ● Supporting Self-Advocacy in Students with Learning Disabilities

There are many ways in which teachers and other members of student support teams can help students develop self-advocacy skills. These include the following:

- Involve students in decision making about their education.
  - Involve students in student-specific planning and in implementing Individual Education Plans (IEPs). (Student input and involvement should increase as students progress through the school years.)
  - Provide opportunities for students to make choices and make plans.
  - Encourage students to participate in performance evaluations, develop self-monitoring skills, and take increasing responsibility for learning (e.g., goal setting, rubrics, portfolio assessments, etc.).
- Help students understand their strengths and needs.
  - Talk with students about the concept of learning disabilities and their own strengths and needs.
  - Provide specific feedback to help students understand how they learn best (e.g., “You seem to remember better when you get a chance to ‘see’ the information.”)

- Help students learn to describe their thoughts. Model the process by describing your own thoughts. Encourage students to talk about what they are thinking and rephrase their ideas to clarify their learning strengths and needs.
- Analyze and explain the results of assessments so students can understand their abilities and needs, as well as the implications of learning disabilities on their education and in their lives outside of school.
- Model and teach appropriate self-advocacy skills.
  - Young students first learn about self-advocacy by observing parents, teachers, and others advocating on their behalf. From an early age, these children can benefit from discussions about their learning strengths and needs as well as observations about the ways in which they learn best. Involve them in conversations about program planning. Even if they seem too young to participate, they can learn about the concepts of collaboration and problem solving by listening.
  - The skills involved in self-advocacy can be demonstrated, role-played, practised, and evaluated. Students may require extensive guidance through the middle years until high school, when there are increased expectations for independence.
  - Help students prepare for meetings, conversations with teachers, or other situations where they may be involved in planning their educational future. Model and role-play appropriate interactions.
  - Help students prepare, manage, and seek out information; effective self-advocates are organized and informed.
  - Provide students with opportunities to meet mentors with learning disabilities. Students may learn a great deal from others who have gone through similar experiences.
- Help students set appropriate and realistic goals in their learning.
  - Students should be actively involved in making decisions about their education, and should be taught ways to set appropriate goals that are tangible and realistic. One possible strategy is to make goals SMART: Specific, Measurable, Achievable, Realistic, Time-related.

Follow-up with students to review their success in achieving goals. Self-monitoring and self-evaluation are important skills for students to develop when they are learning how to set realistic goals.

The following are a few online resources that are designed to support students when they are learning to recognize their strengths and weaknesses, and to speak up on their behalf.

- Alberta Education. Appendix 3F: “Self-advocacy Checklist for Elementary/Junior High School”. *Individualized Program Planning*. Edmonton, Alberta: Alberta Education, 2006. <https://archive.education.alberta.ca>.
- CanLearn Society. *Self-Advocacy*. Calgary, Alberta: Calgary Learning Centre. [www.canlearnsociety.ca/wp-content/uploads/2013/03/LC\\_Self-Advocacy\\_N2.pdf](http://www.canlearnsociety.ca/wp-content/uploads/2013/03/LC_Self-Advocacy_N2.pdf).

- Lundy, Kathleen Gould. *What Do I Do About the Kid Who . . . ? 50 Ways to Turn Teaching into Learning*. (2004). [www.stenhouse.com/emags/8165-1/pageflip.html](http://www.stenhouse.com/emags/8165-1/pageflip.html).
- **The KIT: Keeping it Together™ for Youth (the Youth KIT)**  
The Youth KIT is a tool that assists students in giving, getting, and organizing their own information as they transition to adulthood. Alongside the Youth KIT, there are two videos available to help you and your mentor use the Youth KIT. [www.canchild.ca/en/research-in-practice](http://www.canchild.ca/en/research-in-practice).
- Morel, Pamela, and Diane Berzins. *Planning for Success: Accommodations, Learning Strategies, and Assistive Technology that Work for Me: A Self-Assessment Inventory*, Sudbury, ON: Cambrian College. [www.cambriancollege.ca](http://www.cambriancollege.ca).  
  
Adapted from: Alberta Learning. "Self-Advocacy". *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities*. Edmonton, Alberta: Alberta Learning, 2002. pp.41-44. <https://archive.education.alberta.ca>.  
This section of *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities* was also reprinted in Saskatchewan Learning's *Teaching Students with Reading Difficulties and Disabilities: A Guide for Educators*. Regina, Saskatchewan: Saskatchewan Learning, 2004. [www.education.gov.sk.ca/Reading-Difficulties-Disabilities](http://www.education.gov.sk.ca/Reading-Difficulties-Disabilities).

## Module Summary

Module 7 provided practical strategies and teaching tips that contribute to the development of self-advocacy for students with learning disabilities. As such, benefits and barriers to learning self-advocacy skills for students with learning disabilities were explored. Suggestions were provided regarding how educators, parents, and others in a student's life can work collaboratively with students to support them in understanding their learning disabilities and helping them build and maintain their motivation/determination to face the challenges they encounter. The names of organizations and a list of websites were provided for more information about learning disabilities.

## Resources

### Documents

- Alberta Learning. *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities*. Edmonton, Alberta: Alberta Learning, 2002. <https://archive.education.alberta.ca>.
- Saskatchewan Learning. *Teaching Students with Reading Difficulties and Disabilities: A Guide for Educators*. Regina, Saskatchewan: Saskatchewan Learning, 2004. [www.education.gov.sk.ca/Reading-Difficulties-Disabilities](http://www.education.gov.sk.ca/Reading-Difficulties-Disabilities).

## Organizations

- **Learning Disabilities Association of Canada (LDAC)**

[www.ldac-acta.ca/](http://www.ldac-acta.ca/)

The Learning Disabilities Association of Canada (LDAC) is the national voice for persons with learning disabilities and those who support them. LDAC supports individuals with learning disabilities to enable them to function as citizens with equitable opportunities, and to develop to their chosen potential. LDAC accomplishes these goals through public awareness about the nature and impact of learning disabilities, advocacy, research, health, education, and collaborative efforts.

### **National Office**

250 City Centre Avenue, Suite 616  
Ottawa, Ontario CANADA K1R 6K7

Phone: 613-238-5721

Toll-Free: 1-877-238-5332

Fax: 613-235-5391

Email: [info@ldac-acta.ca](mailto:info@ldac-acta.ca)

- **Learning Disabilities Association of Manitoba (LDAM)**

[www.ldamanitoba.org/](http://www.ldamanitoba.org/)

The Learning Disabilities Association of Manitoba is a non-profit agency that represents individuals with learning disabilities and their families. Members include parents, professionals, persons with learning disabilities, and interested others. LDAM is affiliated with the Learning Disabilities Association of Canada.

### **Provincial Office**

617 Erin Street. R3G 2W1  
Winnipeg, Manitoba

Phone: 204-774-1821

Fax: 204-788-4090

Email: [ldamb@mts.net](mailto:ldamb@mts.net)

### **Brandon and District Chapter**

129B-12th Street  
Brandon, Manitoba

Phone: 204-727-4669

Email: [ldambrdn@mts.net](mailto:ldambrdn@mts.net)

Website: [www.ldambrandon.org/](http://www.ldambrandon.org/)



## Portage la Prairie Chapter

For information on parent support group activities or public information sessions in the Portage La Prairie area, contact the Provincial office at

617 Erin Street. R3G 2W1

Winnipeg, Manitoba

Phone: 204-774-1821

Fax: 204-788-4090

Email: [ldamb@mts.net](mailto:ldamb@mts.net)

- **Dyslexia Champions of Manitoba**

Website: <http://dyslexiachampions.org/>

- **Learning Disabilities Association of Ontario**

Website: [www.ldao.ca/ldadhd-resources/websites-and-online-resources/](http://www.ldao.ca/ldadhd-resources/websites-and-online-resources/)

## Websites

- **LD OnLine**

[www.ldonline.org/](http://www.ldonline.org/)


LD OnLine provides accurate and up-to-date information and advice about learning disabilities and ADHD. The site has sections for educators, parents, and children and features articles, multimedia, monthly columns by noted experts, first person essays, children's writing and artwork, a comprehensive resource guide, forums, and a referral directory of professionals, schools, and products.



# Module 8

Supporting Student *Transition*

from School to Post-Secondary  
Education and Employment



This module provides information to support the transition planning process for students with learning disabilities, including an outline of the steps involved in effective transitions.

## ● Key Ideas in this Module

This module provides:

- an outline of the steps involved in effective transitions;
- transition guidelines for students who are starting school, changing grades, and moving from high school to adult life;
- transition planning tools for students.

## ● Transition Planning Process

Students go through different stages of transition during their school years: preschool to school, early years to middle years, middle years to senior years, and senior years to life after graduation. Transition planning is most effective when the student, parents, and the school team work together to develop a plan that meets the student's needs. The student is always the central member of the transition team.

Planning for each school transition follows the same process as individual education planning (IEP). In Manitoba, IEP is a global term for any written plan developed by a team to address the individual needs of a student. School teams, including families, are likely to be familiar with the IEP process. Often, school divisions will use the IEP template and include transition-related outcomes in the IEP.

For more information about the IEP process, please see the following links:

Manitoba Education: *Student-Specific Planning: A Handbook for Developing and Implementing Individual Education Plans (IEPs)*. Winnipeg, MB: Manitoba Education, 2010. Available online at [www.edu.gov.mb.ca/k12/specedu/documents.html](http://www.edu.gov.mb.ca/k12/specedu/documents.html).

Manitoba Education, Citizenship and Youth. *Working Together: A Handbook for Parents of Children with Special Needs in School*. Winnipeg, MB: Manitoba Education, Citizenship and Youth, 2004. Available online at [www.edu.gov.mb.ca/k12/specedu/documents.html](http://www.edu.gov.mb.ca/k12/specedu/documents.html).

Transition planning consists of four steps that are consistent with the individual education planning process.

1. Set direction.
2. Gather information.
3. Develop the transition plan.
4. Implement and review the transition plan.

## 1) Setting Direction

Teacher/case managers responsible for transition planning begin by identifying key members of the transition planning process. This includes the student, their parents/caregivers, and others who have been or will be involved with the student as they make this transition. Once team members have been identified, the team sets the direction for the transition plan. Setting direction involves the following:

- orienting team members regarding the transition process;
- clarifying members' roles and responsibilities;
- deciding on a process for collaborating and sharing information.

## 2) Gathering Information

The planning team uses ongoing observation and assessment to monitor the student's transition needs and the related curricular outcomes. The team may gather information about the following:

- the student's hopes, interests, aptitudes, and vision for the future;
- the student and his/her family and community background (e.g., language, culture, etc.);
- the student's experiences, strengths, and needs;
- the student's current level of academic performance;
- the skills and knowledge the student requires for successful transition;
- the availability of services and resources;
- the student's ongoing requirements for adaptations or assistive technology.

The team may use the following methods to gather information:

- curriculum-based assessments;
- work samples;
- interviews with the student, parent(s), teacher(s), and/or other support staff;
- inventories or checklists from the student, parent(s), teacher(s), and/or other support staff;
- specific observations of the student in various settings (e.g., classroom, home, etc.);
- existing documents (e.g., student school records, previous assessments, student-developed portfolio);
- assessment of the student's specific skills in real life settings (e.g., vocational, academic);
- diagnostic assessments (formal or informal cognitive assessments or adaptive assessments);

### 3) Developing the Transition Plan

The transition planning team can provide support in the following areas:

- identifying the student's interests, strengths, and needs;
- supporting the development of skills for self-determination and self-advocacy (For more information related to self-advocacy, refer to [Module 7](#));
- teaching the needed skills for continuing education (e.g., effective study strategies, computer literacy skills, communication);
- helping students develop employability skills;
- working with students to expand resumes and career portfolios;
- adjusting students' employment expectations; exploring employment options, and narrowing students' job search focus.

### 4) Implement and Review the Transition Plan

Effective implementation of a transition plan requires that instructional strategies and identified learning outcomes are clearly understood by all team members. Implementation of the plan involves the following:

- securing appropriate co-operation, partnership, resources, and services;
- maintaining ongoing communication with the student, parent(s), and other team members;
- monitoring student progress;
- revising and adapting the plan as necessary;
- communicating progress and outcomes of the plan with team members;
- reviewing and updating the plan at least on an annual basis.

Adapted from: Healthy Child Manitoba. *Bridging to Adulthood: A Protocol for Transitioning Students with Exceptional Needs from School to Community*. Winnipeg, MB: Healthy Child Manitoba, Mar. 2008. 35. Available on the Healthy Child Manitoba website at [www.gov.mb.ca/healthychild/publications/](http://www.gov.mb.ca/healthychild/publications/) and on the Manitoba Education and Advanced Learning website at [www.edu.gov.mb.ca/k12/specedu/plan\\_part.html](http://www.edu.gov.mb.ca/k12/specedu/plan_part.html).

## ● Early Years Transitions

- Help students become comfortable with new surroundings and people by arranging for them to visit new classrooms and teachers.
- Prepare students for new environments by identifying the skills they will need and providing opportunities for them to learn those skills.
- Involve parent(s) in transition planning and help them advocate for their children.

- Listen to students' concerns about transitions; engage them in frequent discussions about a transition and emphasize positive aspects of a new environment.
- Establish consistent homework and study routines; encourage students to be independent learners and praise their efforts to take responsibility for their own learning.

## ● Middle Years Transitions

- Encourage students to discover their learning strengths.
- Teach students to become self-advocates and to explain their learning needs to others. (For more information related to self-advocacy, refer to [Module 7](#).)
- Involve students in transition planning by allowing them to actively participate in goal-setting.
- Help students learn to monitor their own academic progress and share their perceptions with the transition planning team.
- Teach students effective organization and study strategies such as time management, note-taking, test preparation, and test-taking strategies.
- Help students explore appropriate adaptations and assistive technologies.

## ● Preparing for Post-Secondary Education and Training Options

Many students choose post-secondary education after high school. Post-secondary institutions often require prerequisites for acceptance that involve long-term planning, such as the acquisition of certain course credits or skills. The transition planning team may support students in the following ways:

- Help students understand the entrance requirements for post-secondary institutions.
- Help students through the application process.
- Identify disability services available in post-secondary institutions.

Manitoba's post-secondary education institutions include information on their websites that may be useful to future students under headings such as the following:

- Student services;
- Admissions requirements;
- Accessibility services;
- Assessment services;
- Campus life;

- Career planning;
- Disability services.

Students who do not choose post-secondary education may benefit from other community programs or training opportunities after graduation. The transition planning team should ensure that the student and family are able to access information on available community resources.

Additional information to facilitate planning for high school students is available in the following Manitoba documents:

- Healthy Child Manitoba. *Bridging to Adulthood: A Protocol for Transitioning Students with Exceptional Needs from School to Community*. Winnipeg, Manitoba: Healthy Child Manitoba, March 2008. [www.edu.gov.mb.ca/k12/specedu/plan\\_part.html](http://www.edu.gov.mb.ca/k12/specedu/plan_part.html).
- Manitoba Education, Citizenship and Youth. *Focus on the Future: A Parent and Student Guide to Senior Years Graduation Requirements*. Winnipeg, MB: Manitoba Education, Citizenship and Youth. 2008. [www.edu.gov.mb.ca/k12/cur/cardev/resources.html](http://www.edu.gov.mb.ca/k12/cur/cardev/resources.html).
- Manitoba Education, Citizenship and Youth. *Focus on the Future: Career Planning Begins at Home*. Winnipeg, Manitoba: Manitoba Education, Citizenship and Youth. 2005. [www.edu.gov.mb.ca/k12/cur/cardev/resources.html](http://www.edu.gov.mb.ca/k12/cur/cardev/resources.html).
- MB4Youth connects young adults to services and programs related to everything from education to jobs, from driver licensing programs to environmental projects. Visit [www.gov.mb.ca/cyo/youth/index.html](http://www.gov.mb.ca/cyo/youth/index.html).

## Manitoba Post-Secondary Supports for Individuals with Learning Disabilities

Many post-secondary institutions in Manitoba provide services to students with learning disabilities, as well as other specific needs. Please refer to the following websites for more information.

- **Assiniboine Community College – Accessibility and Disability Services**  
<http://assiniboine.net/students/accessibility-disability>
- **Brandon University – Student Accessibility Services**  
<https://www.brandonu.ca/student-services/disability-services/>
- **Red River Community College – Student Services – Applied Learning**  
[www.rrc.ca/student-services](http://www.rrc.ca/student-services)
- **University College of the North – Learner’s Assistance Centre**  
<https://www.ucn.ca/sites/studentdevelopment/lac/Pages/Learner’s-Assistance-Centre.aspx>



- **University of Manitoba – Student Accessibility Services**  
<http://umanitoba.ca/student/saa/accessibility/>.
- **University of Winnipeg – Accessibility Services and the Accessibility Resource Centre**  
[www.uwinnipeg.ca/accessibility-services/](http://www.uwinnipeg.ca/accessibility-services/).

## Canada Student Grant for Students with Permanent Disabilities

The Canada Student Grant for Students with Permanent Disabilities is a grant that provides students with \$2,000, each school year (August 1 to July 31). This grant can be obtained for each year of the student’s studies (including undergraduate and graduate levels) as long as they continue to meet the eligibility requirements.

[www.canlearn.ca/eng/loans\\_grants/grants/disabilities.shtml](http://www.canlearn.ca/eng/loans_grants/grants/disabilities.shtml)

## ● Module Summary

The planning and implementation of transitions is a collaborative and comprehensive process which involves students as well as parent(s). There are many benefits to effective transition planning for all students, including students with learning disabilities. These include the following:

- continuity of programming across settings and grades;
- student awareness, preparedness, and understanding of expectations in new environments;
- school personnel who are knowledgeable about the needs of students transitioning into their classrooms.

Adapted from: Alberta Learning. *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities*. Edmonton, Alberta: Alberta Learning, 2002.  
<https://archive.education.alberta.ca>.

## ● References

Alberta Learning. *Unlocking Potential: Key Components of Programming for Students with Learning Disabilities*. Edmonton, AB: Alberta Learning, 2002.  
<https://archive.education.alberta.ca>.

Healthy Child Manitoba. *Bridging to Adulthood: A Protocol for Transitioning Students with exceptional Needs from School to Community*. Winnipeg, MB: Healthy Child Manitoba, Mar. 2008. [www.gov.mb.ca/healthychild/publications](http://www.gov.mb.ca/healthychild/publications), and [www.edu.gov.mb.ca/k12/specedu/plan\\_part.html](http://www.edu.gov.mb.ca/k12/specedu/plan_part.html).

