

Choosing Instructional Strategies

"[It is] time to start to implement educational change to help youngsters with AD/HD succeed academically. Educational intervention is required at all levels; preservice and inservice education for teachers to bring them up to date with current understanding of AD/HD; implementation of teaching strategies that can be used in mainstream classes to facilitate academic success in children with AD/HD. These teaching strategies need to take into account both the cognitive and behavioural characteristics associated with AD/HD. Instructional strategies can be used that target specific academic needs (e.g., study strategies, literacy skills) in ways that reduce the cognitive load on children's working memory (e.g., scaffolding, instructional supports, enablers) and promote high levels of cognitive engagement."

– Tannock, Martinussen and Chaban, April 12, 2005

Many students with AD/HD struggle in the classroom, particularly in consistently meeting grade level curricular outcomes. Specific aspects of reading, writing and mathematics can be especially challenging for students with AD/HD, especially for the 30 to 50 percent of students with AD/HD who also have learning disabilities. These students need appropriate supports in the classroom in order to be successful learners and achieve their fullest potential.

The sample suggestions provided in this chapter work in conjunction with the strategies offered in other chapters. The needs of students with AD/HD vary widely. No single student will need all of the following strategies and supports.

Many of these strategies and supports may be of benefit to other students in the classroom, not only students with diagnosed attention difficulties.

Structure learning activities

Most students with AD/HD can show surprising capacity to concentrate and put forth effort when schoolwork is personally meaningful and engaging to them. These students respond positively to clarity, structure, predictability and positive reinforcement. They also need clear and concise directions and ongoing monitoring to encourage completion of assignments and activities. Many students will also benefit from explicit instruction in planning skills.

SAMPLE STRATEGIES

■ Structure activities and assignments to engage students' interest

- Design activities and assignments that are brief, recognizing that these students' attention spans are generally short. Break long tasks into shorter, easier-to-manage steps. For example:
 - cut the assignment pages into small segments and give out one at a time
 - fold under part of the page or cover it partially to block or mask some parts of the assignment. Encourage the student to use a “window” to show one problem or piece of information at a time.
- Show students the general information before working out the specifics. Students with AD/HD need to see the big picture first as all details tend to carry the same degree of importance. They also need explicit instruction in identifying what is the overarching idea and what are the supporting details.
- Design learning activities that require a high response rate from students. For example:
 - provide students with a study guide or partial outline of information and ask them to fill it in as the class proceeds
 - provide students with individual white boards, chalkboards or response cards so they can respond while working in large groups

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- vary questioning so that it involves whole class, partner and individual responses
 - structure partner activities so that students can read aloud to each other, question together, confirm understanding, and encourage each other to remain on task.
- Incorporate students' interests into assignments. Create opportunities for student choice in such things as topic activity, order of tasks and materials to be used. Attention is enhanced when information is personally relevant and when it relates to students' interests.
 - Incorporate attention-getting devices into assignments. For example:
 - vary the texture, shape and colour of materials
 - provide students with a variety of coloured pens, pencils and markers to work with
 - consider turning tasks into activities or games. For example, with older students, turn the review of material for a test into a Jeopardy game.
 - Intersperse less-preferred, repetitive or passive tasks with preferred or active tasks to maintain interest and encourage perseverance.
 - Set short time limits for task completion. A timer, such as an egg timer or stopwatch, may be helpful in motivating students to complete the task at hand. (Be careful, however, because some students may find the timer more stimulating than the task.) When possible, involve students in setting the timeframe to help develop a better sense of the amount of time particular kinds of tasks will likely take.
 - Give feedback about the accuracy of assignments as soon as possible.
 - Create opportunities for students to choose from a variety of ways to demonstrate understanding of learning outcomes. For example, to assess knowledge of factual information, encourage students to choose from oral presentations, audio or videotaped projects, news reports or dramatizations.
- **Give clear and concise directions**
- Before starting a task, ask students to clear desks of all but the needed materials.

- Cue the class that instructions are about to begin and then wait until the class is mostly quiet before giving directions.
- If necessary, move closer to the students to get their attention.
- Give directions clearly, slowly and concisely, point by point.
- Provide both visual and printed instructions. For example, as you give directions orally, reinforce them by writing a few key words, phrases, page numbers or picture cues on the whiteboard or overhead. Use the verbal directions for prompting and the print directions for reference.
- Provide explicit structure and cues to emphasize relevant information such as:
 - colour, circle, underline or rewrite such cues as directions, difficult letters in spelling or mathematics operation signs
 - provide a graphic organizer or other structure to help students organize the task by recording the information and steps required
 - point out the overall structure of texts; e.g., topic sentences, headings, table of contents.
- Model what to do. “Think aloud” the associated thinking process.
- Help students make a plan for the task by breaking it down into smaller steps and identifying where to start and where to end. State the goal clearly. Encourage students to use self-talk to apply problem-solving steps; e.g., “What do I need to do first?”
- Check for understanding with the whole class by asking for specifics. For example:

Teacher: “What problems will we do?”
Class: “Numbers 1, 3, 5, 7, 9, 11.”
Teacher: “Will we do problems 8 and 12?”
Class: “No.”
Teacher: “Why not?”
Class: “We only need to do the odd numbers.”
- Ask individual students to repeat or rephrase directions to check for understanding.

- Erase the whiteboard frequently and completely so that remnants of previous activities are not left to distract and confuse the student as the new lesson begins.

■ Monitor for completion

- Provide a sample of what completed work might look like.
- For major assignments provide a clear set of criteria that students can use as a guide for reviewing the quality of their own work.
- Ask students to work through a few questions alone and then check their work together. For example, say “Do the first five and then raise your hand and we’ll check them together to make sure you are on the right track.”
- If only a few individuals need support, put a stop sign after a few questions so that students can let you know when they have completed these questions. Then set another goal to be completed. For the student who frequently seeks help, begin with a few items and gradually increase how much work is expected to be done independently.
- Use a timer to challenge students to complete a set number of questions.
- If the assignment is due the next day or later in the week, ask students to record it on the assignment calendar. Details of the assignment should remain posted until the due date.
- Make a graph for certain tasks, such as vocabulary words, and ask students to record the number of correct answers versus the number of completed answers. This strategy will encourage students to focus on quality more than quantity.
- Monitor frequently. Circulate. Move in closer to individual students who may need cueing to focus. Communicate a supportive attitude.

MYTH

Children with AD/HD can never pay attention or complete their work.

FACT

Inconsistency is a pervasive characteristic of AD/HD. Sometimes, and under some circumstances, individuals with AD/HD can focus and concentrate, while at other times they experience extreme difficulty. They are often able to focus on stimulating video games or creative activities such as Lego or drawing.

■ Teach planning skills

- Involve students in planning different activities. Consider what is needed, how to break tasks into parts, and how to set timelines for completing each part. Provide organizing tools such as flow charts or diagrams.
- Practise estimating the time needed for activities.
- Practise using graphic organizers to create outlines.
- Use a word processor to reorder ideas.
- Explore the use of semantic mapping software to plan and organize information.

Consider how listening affects learning

Many students with AD/HD will benefit from the development of effective listening strategies.

Because many students with AD/HD tend to be divergent thinkers, they may have difficulty immediately retrieving information from memory when they are asked a direct question about a very specific fact. The difficulties may be compounded by anxiety, which will further impede memory. Students are better able to participate if the teacher waits for a signal from them that they are ready to respond. Also, if the question is worded broadly, students who are divergent thinkers are often more able and willing to offer answers.

SAMPLE STRATEGIES

■ Teach strategies for active listening

- Create guidelines for good listening skills and explicitly teach these steps. Review them frequently. For example:

Show me listening with:

- eyes on speaker
- pencils down

- hands on desk
- think along.

- Use students' names to cue them that they are about to be asked a question. For example, "Bobby, this question will be for you ..."
- In class discussions, try to call on students with AD/HD early in the discussion. If they are eager to participate, these students often have difficulty waiting their turn.
- In class discussions, provide waiting strategies to help students remember what they want to say. For example, students may write down the answer or use fingers to recall the number of points to be made.
- Ensure that students feel comfortable asking for repetition of information. Discuss how other people may benefit when one student takes the initiative to ask a question.
- Provide students with appropriate expressions to clarify meaning and to confirm comprehension, such as:
 - "Could you repeat that, please?"
 - "I don't understand."
 - "What does ____ mean?"
 - "Could you say that again, please?"
 - "What do you mean by ...?"
- Analyze how "listener friendly" your teaching is by considering the following teacher checklist from Calgary Learning Centre.

A-5

See Appendix A-5 for a blackline master of the checklist How "Listener Friendly" is My Teaching?¹³

13. This checklist adapted with permission from Calgary Learning Centre (Calgary, Alberta, 1995).

How “Listener Friendly” is My Teaching?

Review the strategies below and mark the column that *best fits your current practice* for helping students to focus on what’s important in the learning activity.

	<i>I do this</i>	<i>Need improvement</i>
1. I reduce distractions for my students (e.g., close the door, move student near the front and away from windows).	<input type="checkbox"/>	<input type="checkbox"/>
2. I clearly communicate my expectations of the students during the class.	<input type="checkbox"/>	<input type="checkbox"/>
3. I provide students with an advanced organizer, outline or listening guide (e.g., highlight major concepts, provide space for notes) at the beginning of class to alert them to what will be addressed in the learning activities.	<input type="checkbox"/>	<input type="checkbox"/>
4. My instructional plan follows the advanced organizer, outline or listening guide.	<input type="checkbox"/>	<input type="checkbox"/>
5. I consistently review and encourage recall of previously presented information (e.g., summarize, question, provide time to review previous notes and handouts).	<input type="checkbox"/>	<input type="checkbox"/>
6. I use cue words and phrases to signal important information (e.g., “ <i>In summary ...</i> , <i>Note the following ...</i> , <i>Pay attention to ...</i> , <i>Record this important fact ...</i> , <i>This is important ...</i> , <i>Listen carefully</i> ”).	<input type="checkbox"/>	<input type="checkbox"/>
7. I use transitional phrases to cue and signal the organization of information (e.g., “ <i>first, second, third; next; before/after; finally</i> ”).	<input type="checkbox"/>	<input type="checkbox"/>
8. I highlight important information by using bold, italics and different coloured text.	<input type="checkbox"/>	<input type="checkbox"/>
9. I vary my volume, tone of voice and rate of speech to emphasize important ideas and concepts.	<input type="checkbox"/>	<input type="checkbox"/>
10. I present information in many different ways (e.g., demonstration, lecture, discussion, videotapes, small group work, overhead projector, lectures with presentation software).	<input type="checkbox"/>	<input type="checkbox"/>
11. I repeat important ideas and concepts by rephrasing and using multiple examples.	<input type="checkbox"/>	<input type="checkbox"/>
12. I write important ideas, key concepts and vocabulary on the blackboard or overhead transparency.	<input type="checkbox"/>	<input type="checkbox"/>
13. I use visual aids and objects to support the concepts and information that is presented (e.g., pictures, diagrams, maps, manipulatives, graphic organizers, overhead projector).	<input type="checkbox"/>	<input type="checkbox"/>
14. I provide examples and nonexamples of concepts.	<input type="checkbox"/>	<input type="checkbox"/>
15. I “talk comprehension,” demonstrate “thinking aloud” and frequently check for understanding (e.g., ask questions during the class, encourage students to ask questions during and after a presentation, encourage students to relate new information to old).	<input type="checkbox"/>	<input type="checkbox"/>
16. I provide students with opportunities to discuss concepts with a partner or small group.	<input type="checkbox"/>	<input type="checkbox"/>
17. I provide time for reflection at the end of the class (e.g., review important ideas, summarize, ask questions, self-evaluate).	<input type="checkbox"/>	<input type="checkbox"/>
18. I briefly review the important concepts at the end of an activity and preview what will be happening next class.	<input type="checkbox"/>	<input type="checkbox"/>

Consider how memory affects learning

Many students with AD/HD may experience difficulties with memory including:

- recalling information despite repeated instructions and review
- keeping track of their belongings
- remembering daily routines despite regular exposure
- recalling facts and procedures, such as new vocabulary words, verb conjugations or mathematical procedures.

They will benefit from instructional approaches that support memory difficulties, particularly short-term or working memory difficulties.

SAMPLE STRATEGIES

■ Use instructional practices that include memory prompts

- Present concepts concretely. Real-life examples add meaning and relevance that aid learning and recall. Concepts presented in familiar or authentic contexts are easier to learn and retain.
- Use language that is familiar to introduce new concepts. Encourage students to connect their previous knowledge to new learning.
- Incorporate hands-on learning experiences and demonstrations. Students learn more effectively when they try out new information and skills in a variety of settings.
- Provide multisensory memory cues. For example, to teach new reading vocabulary, include auditory, visual and kinesthetic cues. Review sound-symbol associations by saying the name of the letter, the sound and a word that starts with that letter while looking at a picture of the word. Trace the letter on the desk, in the air or on your arm.
- Use visual cues to introduce new concepts or review content. For example, use colour-coding, sequences of photos or drawings, charts or videos.

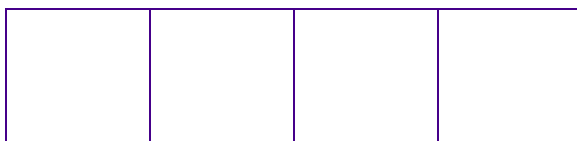
- Use auditory and kinesthetic cues in combination. For example, combine songs with movement and dance patterns. Music and physical routines linked to learning facts can help students memorize faster and act as a cue for retrieving specific information.
- When presenting new information, write down the main points on an overhead or on the board.
- Use verbal rehearsal to practise information to be recalled.
- Provide regularly scheduled reviews of procedures and concepts. For example, start each day by reviewing previously learned skills and ideas. Then present new skills and ideas. Before students leave for home, review the new information.
- Consider using assessments more frequently and on shorter units of work. Use quick, short evaluations rather than formal, longer tests.

■ Provide opportunities for students to develop and use memory prompts

- Tape simple cue cards of daily class routines on students' desks.
- Teach students to make lists of reminders regularly, and note dates and assignments on a calendar. Build procedures into the day for recording information in daytimers or homework agendas.
- Provide memory aids for frequently used information. For example, key vocabulary words can be written on a file card and kept in a pocket on the side of desks. Schedules should be posted on the board or on the wall. Students can keep personal copies in their desks or notebooks.
- Teach students strategies for memorizing specific pieces of information such as the fold-over strategy for learning second language vocabulary or spelling words.

Fold-overs

1. Fold a paper to make four columns.



2. In the first column, copy target vocabulary words in English.
3. In the second column, write the French words for each of the vocabulary words.
4. Check your answers in the text. Correct any answers you got wrong and fill in words you did not know.
5. Fold back the first column so the English words are not visible. Now, practise translating the other way. Look at each of the French words you wrote in the second column and write the English translation in the third column. Check your answers against the original words in the first column.
6. Repeat this process to translate the words back into French in the fourth column. A complete practice page might look like this:

<i>mother</i>	<i>la mère</i> ✓	<i>mother</i> ✓	<i>la mère</i> ✓
<i>father</i>	<i>le père</i> ✓	<i>father</i> ✓	<i>le père</i> ✓
<i>brother</i>	<i>le frère</i>	<i>brother</i> ✓	<i>le frère</i> ✓

■ Teach students how to use mnemonics¹⁴

A mnemonic is a memory trick that helps create an association or link between something that is difficult to remember (such as a tricky spelling word) and an easy-to-remember word or phrase. There are a number of kinds of memory links including the following.

- Built-in-word links: Many difficult-to-spell words contain easy-to-spell clue words. The mnemonic sentence simply links the more difficult word to its clue word. For example, to remember the double *r*'s in the spelling of the word *interrupt*, think "To **err** is human, so is to **interrupt**."

14. Adapted with permission from Murray Suid, *Demonic Mnemonics: 800 Spelling Tricks for 800 Tricky Words* (Carthage, IL: Fearon Teacher Aids, 1981), pp. 2, 3, 4.

- **Definitional links:** The meaning of a word can sometimes provide a clue to correct spelling. In such cases, the mnemonic takes the form of a definition. For example: “A beach is a land by the sea” and “A beech is a tree.”
- **Story sentence links:** This kind of mnemonic tells a story by stating a rule in a memorable way. For example, “Use both **i**’s (eyes) in **skiing**.”
- **Acronym links:** This kind of mnemonic uses an invented sentence based on each letter of a word or the first letter of a list of words. For example, many beginning music students use the sentence “**Every Good Boy Deserves Fudge**” to remember the musical notes **E, G, B, D, F** on the lines of the treble clef.
- **Pronunciation links:** Learn how to spell certain words by inventing memorable ways of pronouncing—or mispronouncing—they. For example, pronounce *Wednesday* “**Wed-nes-day**.”
- **Etymological links:** This kind of link uses one form of a word to clarify the spelling or meaning of another. For example, because it is silent, the **c** in *muscle* is sometimes forgotten, so a helpful mnemonic links *muscle* to the word *muscular* in which the **c** is pronounced. The phrase “If you have muscles, you’re muscular” could help make this memory link.
- **Descriptive links:** This kind of mnemonic simply describes the problem in a succinct, memorable way. For example, to remember that there are two acceptable ways to spell the word *judgment* (or *judgement*), think “Use your own **judgment**, an **e** or not.”

Printing and handwriting

Printing and handwriting can be a source of frustration for many students with AD/HD. These students will benefit from direct instruction in letter formation and page organization, and a flexible approach to how assignments can be completed.

SAMPLE STRATEGIES

- **Choose learning activities that will help students improve the legibility of their written work**
 - Provide models of correct letter formation for posting on each student’s desk.

- Encourage students to do finger warm-up exercises. (This can be a fun class activity when set to music.)
- Encourage appropriate posture and positioning when writing.
- Provide extra white space and enlarged space for written work on assignments.
- Provide self-monitoring checklists such as the following:

Checking My Printing

	Yes	No
1. Are my letters		
– the right size?	<input type="checkbox"/>	<input type="checkbox"/>
– on the lines?	<input type="checkbox"/>	<input type="checkbox"/>
– within the margins?	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there a one-finger space between words?	<input type="checkbox"/>	<input type="checkbox"/>
3. Did I start all sentences with upper-case letters?	<input type="checkbox"/>	<input type="checkbox"/>

- Display particularly good samples of students' work prominently in the classroom.
- Consider structured handwriting programs that systematically teach letter formation.
- Allow older students to print if they are finding cursive writing difficult.
- Teach keyboarding skills. Frequently schedule short practice sessions.
- Explore the appropriateness of word processing software programs and other assistive technology, such as speech recognition software.

■ Reduce the amount of written work required

- Reduce the expectation to recopy drafts. Too often recopying can result in legibility becoming worse instead of better because of fatigue or discouragement.
- Look for ways to reduce the need for handwriting. For example, make arrangements for an individual student to make a copy of a peer's notes or the teacher's notes.

Generating and organizing ideas for writing

Students with AD/HD often have difficulty with organization, which can cause challenges in generating ideas and completing written work.

SAMPLE STRATEGIES**■ Provide rubrics, graphic organizers and strategies for organizing writing**

- Give clear, specific criteria or provide rubrics for written assignments.
- Display examples of finished work and discuss the strengths and/or weaknesses of the examples.
- Model, practise and encourage the use of graphic organizers specific to particular genres (e.g., compare and contrast essays). Use semantic webs, mind maps, story maps and charts.
- Introduce semantic mapping software that assists with the organization of ideas.
- For students who have difficulty starting to write, provide sentence starters or paragraph frames where the first words of each sentence or paragraph are given.
- Outline key steps for working through the writing process. Students may use a checklist or mnemonic to monitor their progress through the process such as POWER: Plan, Order, Write, Edit, Revise.

Choosing Instructional Strategies

- Teach strategies for planning written assignments. Provide planning frameworks for different types of narrative and expository writing, such as the PENS strategy.¹⁵

PENS

- P** review ideas.
Think about what you want to say.
- E** xplore words.
Identify the key words you will need in the sentence.
- N** ote words in complete sentence.
Write out the sentence.
Be sure to capitalize the first word and punctuate the sentence.
- S** ee if sentence is okay.
Make sure it makes sense.
Select verb or verbs.
Ask yourself who or what is doing verb/verbs.
Check to see if sentence fits a formula.

- Teach strategies for proofreading and editing written work, such as the COPS strategy. Students can use this simple acronym to remind themselves of what to look for in their own writing.

COPS

- C** apitalization
- O** verall appearance (e.g., legibility, neatness)
- P** unctuation
- S** pelling

- Develop individual self-monitoring checklists focusing on the student's particular areas of difficulty.
- Teach students how to use the editing features of word processing programs.

15. Reproduced from Donald D. Deshler, Edwin S. Ellis and B. Keith Lenz, *Teaching Adolescents with Learning Disabilities: Strategies and Methods*, 2nd ed. (Denver, CO: Love Publishing Company, 1996), p. 170.

Spelling

Spelling involves memory and an understanding of the sound-letter system. It also involves the ability to self-monitor and attend to details. Many students with AD/HD struggle with inconsistency in spelling. They can often learn a list of spelling words for a test but because of short-term memory difficulties, they may not be able to spell words correctly in different writing contexts.

SAMPLE STRATEGIES

■ Teach strategies for learning new spelling words

- Reduce the number of spelling words students are required to learn at one time.
- Provide opportunities to practise spelling words through novel and fun activities such as using colour to identify difficult parts of words or making fill-in-the-blank puzzles to practise new words. See page 73 for a sample practice strategy using fold-overs.
- Teach and encourage the use of mnemonics to help students learn and recall the spelling of words. See pages 73–74 for sample types of mnemonics.
- Encourage students to develop personal word lists to refer to when completing written assignments.

■ Help students identify assistive technology that will help them be more accurate spellers

- Teach students how to use the spell checker feature in word processing programs.
- Encourage the use of hand-held electronic spell checkers.

Reading comprehension

Reading involves a number of complex skills and many students with AD/HD struggle with one or more aspects of the reading process.

SAMPLE STRATEGIES

■ Teach reading comprehension strategies across the subject areas

- Model and teach prereading strategies that activate prior knowledge, build vocabulary and set a purpose for reading, such as a K–W–L (What I Know, What I Want to Know, What I Learned) chart.

A-6

- Model and teach key reading comprehension strategies of predicting, visualizing, clarifying, questioning and summarizing. See Appendix A-6 for a sample survey for informally assessing students' use of reading strategies.

- Encourage students to monitor their comprehension during reading. Physical supports may be helpful such as using sticky notes to jot down questions, vocabulary and predictions. Students may also mark a segment of text to indicate that it was understood (✓), interesting new information (!) or not understood (?).

A-7

- Teach specific strategies for reading textbooks. See Appendix A-7 for a sample organizer to preview a textbook.
- Encourage students to use information they have read by providing opportunities to:
 - complete charts and graphic organizers based on the reading
 - discuss concepts after reading
 - connect reading to writing activities.
- Provide graphic organizers that encourage active thinking while reading such as a story map, a storyboard for drawing the sequence of events or an outline with missing information. Students can record information as they read, and then review and add information after they've finished reading.

- Teach strategies for reading for different purposes. For example, the reading at WARF speed strategy¹⁶ encourages students to:

WARF

- W**iden your eye span
 - read more than one word at a time
 - read groups of word (e.g., the + noun).
- A**void skip backs
 - keep reading to try to get meaning from the context.
- R**ead silently.
- F**lex your reading rate
 - read important information slowly
 - read familiar information faster
 - if looking for specific information, read even faster.

FYI

- Investigate assistive technologies for learning to support reading, such as the text-to-speech software Read & Write Gold™. For more information, see www.lrc.education.gov.ab.ca/pro/QA/q-and-a.htm?vmod=TH_ESO.

Mathematics

Mathematics can be an area of difficulty for many students with AD/HD. In order for younger students to master key concepts, it is essential that they learn how to organize their work and understand basic patterns. Some students with AD/HD have challenges completing math tasks because of memory difficulties or inability to attend to critical details such as operation signs. It is sometimes helpful for students to say aloud the steps in the math operation before beginning a task. Encourage the use of supports for math facts. For example, use math fact tables and calculators so that difficulty remembering math facts does not limit students' progress in other math areas.

16. Adapted by Rosemary Tannock from Esther Minskoff et al., "WARF," *The Learning Toolbox*, <http://coe.jmu.edu/learningtoolbox/WARF.html> (Accessed July 2006).

SAMPLE STRATEGIES

■ **Design tasks and materials that consider spatial organization and fine motor difficulties**






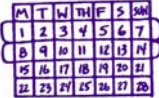


- Reduce the amount of information on a page.
- Provide a “window box” template to view one question at a time.
- Draw boxes around individual questions or tasks to separate them.
- Provide graph paper to align numbers correctly.

		4			7	
	+	3		+	5	
		7		1	2	

- Provide explicit instruction in number formation.
- Use colour to help students focus; for example, highlight +, −, × in different colours to cue the student to attend to the correct operation.
- Reduce the number of tasks to be completed.
- Reduce the amount of copying required.

■ Teach strategies to support memory recall

- Provide charts or cue cards to prompt students to use the concept of doubles to remember basic math facts. For example:

Doubles		
Double ¹⁷	Look	Listen
$2 + 2$		The Car Fact 2 front tires, 2 back tires = 4 tires
$3 + 3$		The Bug Fact 3 legs on each side = 6 legs
$4 + 4$		The Spider Fact 4 legs on each side = 8 legs
$5 + 5$		The Fingers Fact 5 fingers on each hand = 10 fingers
$6 + 6$		The Dice Fact 6 dots on each die = 12 dots
$7 + 7$		The Two Weeks Fact 7 days in each week = 14 days
$8 + 8$		The Crayon Fact 8 crayons in each row = 16 crayons
$9 + 9$		The Double-Nine Dominoes Fact 9 dots on each side = 18 dots

Doubles Plus One or Two

When adding numbers that are close to a double, such as $3 + 4$ or $9 + 7$, think of doubles that will help.

For example, to add $3 + 4$, think of the double 3: $3 + 3 = 6$; $6 + 1 = 7$

17. Adapted from *The School Survival Guide for Kids with LD (Learning Differences)* (p. 89) by Rhoda Cummings, Ed.D., and Gary Fisher, Ph.D., copyright © 1991. Used with permission of Free Spirit Publishing Inc., Minneapolis, MN; 866-703-7322; www.freespirit.com. All rights reserved.

■ Teach strategies that use the commutative property

- Remind students that if they memorize one addition or multiplication fact, this fact will help them remember the related reverse-order fact.

Know One, Know the Other

The order of the numbers in addition and multiplication facts does not change the answer; this is also called the commutative property. If you know one fact, such as $2 + 3 = 5$, then you also know $3 + 2 = 5$.

■ Use counting on and counting back to solve equations

- Encourage students to identify the bigger number in an equation and count forward to add or count backward to subtract.

Counting On

When adding two numbers less than 20, start at the bigger number and count up to the smaller number.

For example, to add $7 + 2$, think “7 is the bigger number, so start counting on at 7. So, 7 (count up two numbers), 8, 9. So, $7 + 2 = 9$.”

Counting Back

To subtract 1, 2 or 3 from a number, count backwards from the bigger number.

For example, to subtract $8 - 2$, think “8 (count back two), 7, 6. So $8 - 2 = 6$.”

■ Encourage students to use addition facts to help them remember related subtraction and multiplication facts

- Teach strategies for turning around subtraction facts and using doubles and other strategies when multiplying. For example:

Think Addition

To find the answers to subtraction facts you do not know, turn the subtraction fact into an addition fact and find the missing part.

For example, turn $11 - 7$ into an addition fact, $7 + ? = 11$. Figure out the missing part. So, because $7 + 4 = 11$, then $11 - 7 = 4$.

Multiplication Facts

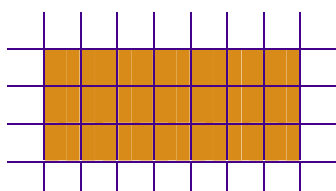
Use the commutative property. If you know $2 \times 9 = 18$, then you also know $9 \times 2 = 18$.

To multiply by 0 think:	$0 \times \text{any number} = 0$
To multiply by 1 think:	$1 \times \text{any number} = \text{that number}$
To multiply by 2 think:	doubles
To multiply by 3 think:	doubles plus the number (3×2 think: $2 \times 2 = 4$; $4 + 2 = 6$)
To multiply by 4 think:	doubles plus doubles
To multiply by 5 think:	count by 5s
To multiply by 6 think:	count by 5s then add the number (6×7 think: $5 \times 7 = 35$; $35 + 7 = 42$)
To multiply by 7 think:	of the facts you already know — if you know 3×7 then you know 7×3 ; memorize $7 \times 7 = 49$ and $7 \times 8 = 56$
To multiply by 8 think:	if you know $4 \times 8 = 32$, then $8 \times 4 = 32$ memorize $8 \times 8 = 64$
To multiply by 9 think:	add a 0 to the other number and then subtract that number (9×2 think: $20 - 2 = 18$)
To multiply by 10 think:	add a 0 to the other number; e.g., $10 \times 6 = 60$

■ Teach visualization strategies for multiplication and division facts

- Colour an array (display) on graph paper, or build one with stamps, buttons, blocks, etc., and write the matching number sentences below the array. For example:

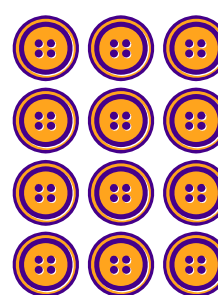
Visualizing Multiplication/Division Facts



$$\begin{aligned} 3 \times 7 &= 21 \\ 7 \times 3 &= 21 \\ 21 \div 3 &= 7 \\ 21 \div 7 &= 3 \end{aligned}$$



$$\begin{aligned} 4 \times 2 &= 8 \\ 2 \times 4 &= 8 \\ 8 \div 4 &= 2 \\ 8 \div 2 &= 4 \end{aligned}$$



$$\begin{aligned} 4 \times 3 &= 12 \\ 3 \times 4 &= 12 \\ 12 \div 4 &= 3 \\ 12 \div 3 &= 4 \end{aligned}$$

■ Teach strategies for practising math facts that are active and engaging

- Use card games, board games and flash cards to practise facts. For example:

Addition Challenge

Two players each have a deck of cards. Remove the face cards. Both players turn over two cards at the same time and call out the sum of their two cards. The player with the largest correct answer gets one point. The game continues until one player reaches a predetermined goal, say 25. This game can also be played with 10- or 12-sided dice.

Multiplication Race to 1000

Using a deck of playing cards, each player draws two cards and multiplies the two numbers together. Check the answer with a calculator. If the answer is correct, record it on a race card, like the one pictured below. Players take turns, adding their answers up as they go. The first player to reach 1000, wins.

This game can also be played with 10- or 12-sided dice.

Race to 1000 Card

0			
			1000

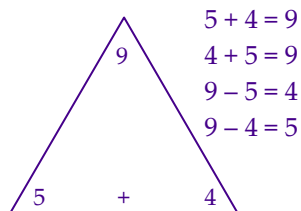
Flash Cards

Make or buy flash cards. Use them for independent practice, in races or for practice with a partner.

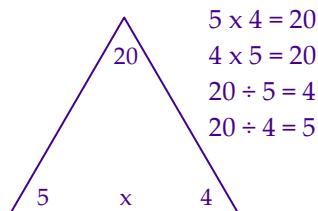
For an added challenge, use triangular flash cards to help students become familiar with the three numbers involved in each math fact. These cards can be used for addition and subtraction or with multiplication and division facts. Use triangles with equal sides approximately 10 cm x 10 cm x 10 cm, so that when held at arm's length, the student can see all three numbers in the pattern.

For example:

Addition



Multiplication



Cognitive credit cards¹⁸

Cognitive credit cards (CCC) are a learning strategy that provides students with nonmemory-based, self-mediated cues. These sets of cues prompt students to think about their thought processes as they attempt to solve particular problems or learn particular concepts. A set of cues becomes the strategy.

The process of developing a CCC begins when a teacher or student identifies a particular procedure or concept that the student is having difficulty learning and remembering. Students then begin, with the teacher's guidance, to develop a set of cues that will help them think about their processing of the information. The student and teacher revise the cues until they are in exactly the form that represents the most meaning for the student. The teacher makes sure the cues are cognitive prompts and that they provide little or no subject content and little or no content-specific procedural information. The CCC becomes a cognitive organizer for a specific topic focusing on how the student is to learn and remember, rather than what the student is to learn and remember.

The example below shows a cognitive credit card designed by a Grade 6 student who felt that there were "just too many things to keep in my head at the same time" while she was doing division questions in class or for homework. The CCC questions address her specific difficulties with how to begin the operation, how to manage decimal placements and place values, and what to do with remainders.

Math: Long division questions

1. Is the question in the right form?
2. Is the smaller number outside and the larger one inside?
3. Can the small number go into the large one evenly?
4. Do I have to borrow?
5. Did I multiply and subtract?
6. Are my numbers in the right place?
7. Do I need to bring down a number?
8. Is there a decimal place in this question?
9. Is there a remainder? What form and units?
10. Did I check my answer? Does it make sense?

18. Adapted from "Cognitive Credit Cards: Acquiring Learning Strategies" by Alan L. Edmunds, *Teaching Exceptional Children*, 31, 1999, pp. 69, 70, 71. Copyright 1999 by The Council for Exceptional Children. Adapted with permission.

CCC cards will look different for different students. The content depends on the teacher “talking out” the cues with the student and engaging the student in discovering how he or she would best go about dealing with the topic at hand. Teachers can use questions such as:

- How can you remind yourself what to think about to get started?
- What will you have to think of next?
- How will you ask yourself if you have remembered to think of specific steps in the process?
- How will you check to see if your thinking is working?

Once the student and teacher develop a set of cues for a particular topic, the cues are printed onto a piece of paper the size of a credit card. Next the CCC is laminated and attached to a binder. Whenever students need a reminder, such as during assignments, homework or tests, their personalized cognitive learning strategy is available. This strategy can be used across the subject areas.

Monitoring academic progress

Create multiple opportunities for students to demonstrate learning. Use a diverse range of information sources to get a clearer picture of students’ learning strengths and challenges. Provide students with the opportunity to suggest alternative ways to demonstrate their learning. For example, students may choose to report what they learned in radio broadcasts, letters to authors, displays, models, dramatic presentations, collages or multimedia products. Such choices allow students to use their strengths to demonstrate their knowledge.

Error analysis

Conduct an error analysis on completed assignments and tests to determine students’ strengths and difficulties. Encourage students to analyze their performance as well. For example, students may ask themselves these questions:

Are errors related to:

- misreading directions
- mistakes with details or losing track of details
- not understanding concepts
- difficulty applying concepts
- test-taking issues such as anxiety
- difficulty studying?

Are errors in reading words in a passage related to:

- meaningful substitutions
- skipping words or whole lines of texts?

Are errors in math related to:

- poor recall of math facts
- misunderstanding of a concept
- forgetting part of a procedure
- losing track of details?

Performance assessment

Use performance assessment to help students understand the demands of a task.

- Provide specific criteria to help students set performance goals.
- Use exemplars, modelling and outlines of expectations to provide explicit step-by-step instruction.
- Involve students in self-evaluation and provide specific feedback about their evaluation.
- Provide prompt and specific feedback to allow students to set new goals for improved performances.

Test formats and procedures

Adjust test formats and procedures to allow students to demonstrate their knowledge. Because students with impulsivity are challenged by multiple-choice tests, consider using short answer or fill-in-the-blank questions instead. When multiple-choice tests are necessary, teach students to read answers quietly to themselves before choosing an answer.

SAMPLE STRATEGIES

■ Look for ways to make tests more manageable for students

- Ensure the test format is uncluttered and has adequate white space on the page.

- Consider the benefits of a shortened version of a test or the test divided into several smaller parts and completed in several short writing periods over several days.
- Provide a distraction-free environment.
- Allow more time to complete the test.
- Consider building in a brief break for some movement during lengthier tests. If it is not feasible for students to leave their seats, teach them some techniques to use in their seats, such as chair push-ups.
- Explore how the student might benefit from using a word processor to complete tests.
- If needed, reduce the writing demands and allow a student to complete the test orally.

Learning portfolios

A collection of student work from the past year gives the receiving teacher a perspective of students' personal growth and a baseline for expectations and assessment. This information can also be shared with parents to help them support their child and the teacher in the learning process.

Involve students

Whenever possible, involve students in the assessment process. Encourage them to enhance their self-advocacy skills by increasing awareness of their own strengths and needs, and of the supports they require to be successful in the classroom.

SAMPLE STRATEGIES

A-8

- Discuss individual learning strengths and challenges with students. Discuss the strategies they know and use, and what works best for them. See Appendix A-8 for a sample tool to help students identify and record information about their strengths and challenges.

A-9

- Provide opportunities for students to identify what kinds of things help them learn. See Appendix A-9 for a sample tool “What Works for Me Inventory.”
- Provide ongoing feedback to students about their progress.
- Involve students in developing assessment and assignment rubrics.
- Involve students in goal setting, reflection and self-assessment (e.g., through learning logs, goal sheets, self-reflection captions on portfolio selections and self-assessment rubrics).
- Set up regular check-in times with individual students. Schedule five to fifteen minutes every day or once a week to informally chat with individual students about how things are going.

Team approach

Many students with AD/HD require support across the school day. Often it takes a schoolwide team approach to ensure these supports are consistently in place for those students who need them. Some students may benefit from a teacher-advisor who acts as their advocate and liaison with other school staff. Share information about specific strategies that work for individual students. For example, regularly schedule time for staff meetings to identify and discuss instructional strategies that will benefit a number of students in the school. This kind of discussion could lead to more in-depth discussions about what kinds of instructional supports might work for individual students and how these types of supports could be implemented or adapted across the subject areas.

A-10

See Appendix A-10 for a sample list of strategies that can be adapted to support students in reading, writing, and completing fine and gross motor tasks.

A-11

See Appendix A-11 for a sample list of learning strategies including ways to develop attention and memory skills.

Identifying potential strategies is just the starting point. It is also essential that the school team review the effectiveness of different strategies so that teachers can make ongoing adjustments to their instruction and tailor their choice of strategies to specific student needs.

A-12

See Appendix A-12 for a sample form for evaluating the effectiveness of a support strategy.

Choosing Instructional Strategies

Ongoing communication between team members is also crucial to creating effective academic support for students with AD/HD. If a student does not require an IPP, teachers need to develop a plan for sharing information about what supports work for this student. Consider the following example of an individual student support plan that is adapted from one used at Medicine Hat High School. This two-page informal plan identifies strategies that are helpful to an individual student and records essential information needed for instructional planning (such as reading level). Teachers can add information as they identify additional supports.

A-13

See Appendix A-13 for a blackline master of this Individual Student Support Plan.

Individual Student Support Plan¹⁹Student Name: David Student Teacher-Advisor: Ms. MappHomeroom: 10C Grade: 10Current Reading Level: 7 Current Math Level: 10Subject Teachers: J. Earth (science) J.H. Word (language arts)
P. Numeral (mathematics) W. Mapp (social studies)

The following is a list of strategies and supports that may assist in student learning. Only those checked pertain to this student. Please feel free to add any strategies that you have found to be helpful and to contact the teacher-advisor if you have questions or suggestions.

A. Seating

- | | |
|---|---|
| <input type="checkbox"/> seat at front of class | <input checked="" type="checkbox"/> seat away from distractions |
| <input type="checkbox"/> seat at back of class | <input type="checkbox"/> allow student to stand rather than sit |
| <input type="checkbox"/> locate near teacher | <input type="checkbox"/> provide alternate workspace |

B. Instructional Presentation

- | | |
|--|--|
| <input type="checkbox"/> adapt pace of lesson | <input type="checkbox"/> colour code print material |
| <input type="checkbox"/> highlight key points of information | <input checked="" type="checkbox"/> break information into smaller steps |
| <input checked="" type="checkbox"/> provide examples completed by other students | <input checked="" type="checkbox"/> photocopy notes |
| | <input type="checkbox"/> provide regular review time in class |

C. Assignment Completion

- | | |
|--|--|
| <input type="checkbox"/> allow extra time | <input checked="" type="checkbox"/> allow use of calculator |
| <input type="checkbox"/> cover parts of worksheet | <input type="checkbox"/> provide checklist of steps to complete activity |
| <input type="checkbox"/> increase white space for answers | <input checked="" type="checkbox"/> use computer to complete assignments |
| <input type="checkbox"/> reduce amount of information/questions on the page | |
| <input type="checkbox"/> ensure student records information in homework agenda | |

D. Attention Support

- | | |
|---|---|
| <input type="checkbox"/> reduce materials on desk | <input type="checkbox"/> provide checklist for organizational tasks |
| <input checked="" type="checkbox"/> provide buddy to clarify missed information | <input checked="" type="checkbox"/> use nonverbal or verbal sign to cue student |

E. Behaviour Support

- | | |
|--|--|
| <input type="checkbox"/> provide buddy to model appropriate behaviour | <input checked="" type="checkbox"/> provide positive reinforcement |
| <input type="checkbox"/> use agenda to communicate with other teachers | such as low-key verbal praise |

19. This form adapted with permission from the work of January Baugh, Deb Rawlings and Carrie-Anne Bauche, Medicine Hat High School (Medicine Hat, Alberta, 2005).

F. Reading Support

- allow extra time
- buddy reading
- use of text-to-speech software

G. Writing Support

Reduce writing demands through:

- use of word processor
- allowing point form to replace paragraphs

H. Assessment and Evaluation Procedures

- smaller chunks of information or simpler concepts
- use individual criteria to evaluate tasks
- use notes or textbook during tests
- allow extra time on tests
- use word processor
- clarify directions

Medical Issues

AD/HD combined Asthma (currently under control but
Long acting medication (taken at home) does have inhaler in backpack for
exercise-induced incidents)

- There are no current medical issues relevant to this student's learning.

Individual Information

- Encourage David to send e-mail questions from home re: assignments. W. Mapp
- He's also using e-mail to send himself reminders of assignments/tests (with a cc to dad).
- Is using his personal music player for listening to novels. J.H. Word

Teacher AssistantDoes this student receive the support of a Teacher Assistant? Yes No

Name of Teacher Assistant _____

Check the types of tasks required:

- record class notes
- monitor student understanding of content
- reteach concepts
- monitor progress on assignments
- read and explain text and handouts with student
- report to teacher any important information on student's progress/understanding
- support small group work
- scribe for student
- troubleshoot assistive technology
- monitor student's on-task behaviour
- track assignment (know what is due, when it is due, that student is handing work in)
- monitor binders/materials
- deal with minor discipline issues/report larger issues to teacher
- Teacher assistant availability _____

