

Learning Functions of the Brain

Educational Area: Problem solving; inferencing; comprehension

Technical Area: Fluid Reasoning

What it Means: Solving unfamiliar problems on the spot that cannot be solved automatically.

How it Connects to Learning:

- Problem solving is important when:
 - Figuring out how to solve word problems
 - Engaging in higher order thinking and reasoning
 - Drawing inferences from a text (i.e. I can infer by his actions that he is more interested in fame than helping others)
 - Understanding abstract main ideas (i.e. The main idea of this chapter is that love is more than a feeling)
 - Comparing and contrasting in reading or writing (i.e. How are two characters similar and different?)
 - Transferring or generalizing a learned skill to another learning situations (i.e. learning an algorithm and then applying it in a word problem or reading a story about civic responsibility and then writing an opinion on the same topic)
 - Extending your knowledge through critical thinking (i.e. developing a theme, analyzing a text to find themes)

Strategies to Support:

- Develop student's skill in categorizing objects and drawing conclusions
 - Use tools to categorize such as graphic organizers or concept maps to organize information in visual format
- Use demonstrations to externalize the reasoning skill
 - Think alouds (i.e. I'm thinking that I first need to determine the number of apples in the basket before I can...)
 - Expanded answer keys containing the "reason" for correct/incorrect choices
 - Problem solving charts hanging in classroom or at desk
 - Mnemonics that are memorable and accurately represent the learning task
- Gradually offer guided practice to promote internalization of procedures or processes
 - Guided questions list
 - Guided list for implementing procedures, formulas
- Offer targeted, explicit feedback
 - Expand concepts with models and examples (i.e. an example of having an advantage is when the Hulk arm wrestles a baby. Who has the advantage? Why? Now, who has the advantage in this story?)

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- Cooperative learning
 - Preferred seating to provide easy access to a peer model with strong reasoning skills
- Reciprocal teaching
- Comparison of new concepts to previously learned concepts (same vs. different)
 - For example, remember that we learned in that multiplication can help us solve the number of eggs in 3 cartons. Multiplication can also help us solve the number of M&Ms in 5 bags. The difference is we are looking at bags instead of cartons.
- Use analogies, similes, metaphors paired with concrete explanations when presenting tasks
- Manipulatives to demonstrate relationships (i.e. part versus whole)

Learning Functions of the Brain

Educational Area: Writing, cutting, typing, etc.

Technical Area: Fine Motor skills

What it Means: The ability to use your hands/arm to accurately perform daily tasks such as writing, cutting, buttoning etc. fluidly and with good accuracy.

How it Connects to Learning:

Behaviors: Student hates writing, will avoid writing tasks or shut down during writing. Student takes an extremely long time to complete writing tasks. Writing is illegible/difficult to read due to trouble with letter formation/difficult time writing within the lines/difficulty with sizing/spacing. Student appears fatigued when writing (i.e. indicating they are tired, hand gets tired).

Typical teacher response:

He isn't trying hard enough/He must be rushing and not paying attention when he writes
"Erase and do it again—I CANT READ THIS! HOW MANY TIMES HAVE I TOLD YOU?"

How does it feel?

Hand is fatigued during simple writing tasks (like there are weights on your fingers/wrist/arm)

Student is frustrated, they see what they need to do, they know what it is supposed to look like, but when they try to execute the task, it does not come out how they envision in their brain despite all the focus/concentration and effort they put forth.

How will it impact learning?

Trouble keeping up in class, falling behind in all subjects (you need to write for all subjects)

Trouble reading notes/writing themselves, gets home and doesn't understand or can't make sense of notes they need to study or finish homework—parent frustrated/student frustrated/teacher frustrated

Strategies to Support:

Modified Paper: Tri-lined, graph paper, raised paper, grayscale paper

Pencil Grips: (best for Pre K-3rd) Helps promote tripod grasp

Vertical Working Surface: Use easels/attach papers on the wall (stand and learn) using a slant board or binder for writing tasks (These things help you to stabilize forearm/wrist so student can focus on just pushing with their fingers)

Break Your Pencils/Crayons: Writing utensils that are 1-2 inches long force students to use a tripod grasp instead of developing bad habits

Allow for Accommodations: Typing in lieu of writing for written tasks, copy of peer's or teacher's notes, take a picture of homework log or directions to take home, speech to text apps (Dragon Dictation, Notability; **Google Read and Write**)

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Exercises to Increase Hand Strength:

1. Write letters on clothes pins and have students clip them on word cards or along a suspended string for spelling practice
2. Hide small objects (beads) in play-doh/putty and have student find them
3. Use a stress ball and have student squeeze each time they say a letter/word/number when reading or counting

Teaching Strategies:

4. **Structured handwriting curriculum (e.g., Handwriting Without Tears)**-Curriculum of worksheets/activities that teaches developmental sequence of fine motor movements. Teacher can have student practice a worksheet daily.
5. **Provide Writing Warm Up Activities**-Example: Pencil Pick-Ups in Handwriting Without Tears—fun activities to warm up fine motor muscles (i.e. drawing teeth on an alligator)
6. **Word Processing: Allow student to type work on computer.**

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Educational Area: Communication (Speech and Language)

Technical Area(s): communication disorder, language, speech, social language/pragmatics, phonology/articulation, expressive language, receptive language/comprehension, fluency/stuttering, intelligibility, AAC/augmentative and alternative communication

What it Means: Communicating with others, using spoken or alternative modalities, in academic and social contexts to build meaning and shared understanding. Speech production - pronunciation (phonology/articulation) and/or fluency (stuttering) - may be affected.

How it Connects to Learning:

Directly links to Common Core Speaking & Listening Standards and supports reading and writing standards.

Language/Communication:

Students are expected to engage in meaningful communication with peers and participate in conversations across a variety of opportunities within the classroom and social settings in school, in a fashion that is similar to peers.

Students with a *language disorder* may have significant difficulty understanding the language of the classroom (**i.e. receptive language**), organizing their thinking and formulating cohesive sentences to make meaningful contributions (**i.e. expressive language**), following agreed upon social conventions (**i.e. pragmatic language**) requiring significant and ongoing scaffolds beyond those provided by general education teachers.

Caveat: Social/emotional, environmental, linguistic and cultural influences need to be considered because students with diverse backgrounds can appear similar to students with a language disorder.

Speech Production/Communication:

Phonology

Students with phonological disorders have difficulty pronouncing words and being understood by others. Moderate to significant phonological needs can decrease a student's intelligibility and reduce their ability to engage in meaningful communication. Intelligibility refers to the degree to which a student's speech is understood. Students with phonological disorders have multiple sound substitutions (e.g. fronting: *do* for *go*, *tat* for *cat*, cluster reduction: *pass* for *splash*). Social isolation can begin as the child gets older as it becomes more and more difficult for peers to understand them.

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Articulation

Students with articulation disorders have difficulty producing specific speech sounds, typically later-developing sounds (e.g. /r/, /l/, /s/, “th”). These errors generally do not have a significant impact on speech intelligibility or academic progress.

Fluency

Students with fluency disorders (e.g. stuttering) may have disruptions in the flow of speech that is not typical of students the same age and grade, and interferes with their participation in communication opportunities. Stuttering behaviors may include sound repetitions (e.g. I w-w-w-wa-want that), prolongations (e.g. I wwwwant that), and blocks (e.g. I w----ant that). Students may also avoid speaking situations due to fear of stuttering and potential negative listener reaction.

Strategies to Support:

Language/ Communication using UDL Principles (engagement, representation, action/expression)

- Use visuals throughout the instructional day
- Recast or expand what a child has said. Child: “Me get presents.” Teacher: “You got presents for Christmas.”
- Model language for a variety of purposes and at varying levels of complexity
- Intentionally provide opportunities for communication
- Check for understanding
- Front-load and allow for processing time. Let the student know you will be calling on them to answer a question, call on a few other students first to allow that student to process and practice their response
- Write out directions on the board or on paper so student can see them in addition to hearing them
- Create multi-sensory opportunities for learning (visual, kinesthetic)
- Seating near the teacher and/or a strong peer model
- Use graphic organizers for reference by students

Speech Production

Phonology/Articulation:

- Provide word/sound modeling so the student continues to hear the correct pronunciation
- Focus on the child's communicative intent (intended message) rather than the grammatical or pronunciation error.
- Avoid correcting mistakes. Instead repeat what student said the correct way (i.e. Student: “What ith that?” Teacher: “What is that? I don't know, let's find out!”)
- When you cannot understand a portion of something a child has said you can reframe your message including the portion that you did understand “That sounds like exciting news, you went where on your vacation?” This avoids frustration on the student's end but also validates that you have heard them and are interested in what they have to say.

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- Take the communicative burden off the student. You can say something like, “I need help. Please help me understand...” This puts the child in the role of helping you, rather than fixing what was wrong.

Fluency:

- Allow students to speak for themselves (i.e. resist the urge to finish sentences).
- Be a patient listener. Allow the student time to express his/her message.
- Reflect back what you have heard so the student knows that you have understood them.
- Be aware of the reactions of other students in the class, so that you can educate peers and provide support for the student who stutters.
- Avoid providing advice like “Slow down,” “Take a deep breath”, “Start over”, “ Think about what you are going to say.” These suggestions can put unintended pressure on the student and make communication harder.
- Create a less stressful environment as stress can exacerbate fluency issues. Encourage turn taking in the classroom to limit interruptions between peers.

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Educational Area: Phonological Awareness, Phonics, Decoding

Technical Area: Auditory Processing and Phonological Processing

What it Means: Auditory Processing is a natural process of taking in sound through the ear and having it travel to the language area of the brain to be interpreted.

When one is faced with an auditory processing deficit, his or her ears can pick up the sounds, words, etc., but his or her brain is not able to process the sounds properly-- the auditory information becomes jumbled up or confused and therefore, misunderstood.

How it Connects to Learning:

Phonetic Coding (PC). - This is the ability to hear phonemes (units of sounds in a word) distinctly. In addition it includes the ability to hear speech sound discrimination and to hear speech sounds despite the presence of other auditory stimulus.

Students that have a deficit in this area may have difficulties with hearing information presented orally, paying attention in the presence of background noise, discerning the direction from which auditory information is coming, discriminating between simple sounds, blending sounds together to make words, and isolating sounds in words.

How it relates to Dyslexia

The most distinguishing feature of dyslexia is poor phonological awareness, which manifests in an inability to identify and blend together individual phonemes in words.

Reading Difficulties:

- acquiring phonics skills (relationship between sounds and written symbols)
- sounding out words
- using phonetic strategies

Math Difficulties:

- Reading word problems

Writing Difficulties:

- Spelling
- Note taking

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- Overall poor quality of writing

Strategies and Accommodations for Support:

Class Environment

- Preferential seating – proximity to teacher when delivering the lesson
- Localize sound source for student and minimize background noise
- Use visual tools like a whiteboard to support oral lessons
- Provide a quiet area for independent work
- Arrange a classmate to share notes
- Allow student to take pictures of notes.

Lesson Presentation and Testing

- Develop reading strategies (Does it look right, does it sound right, does it make sense?)
- Supplement oral instructions with written instructions
- Chunk instructions in to small parts
- Use decoding strategies – blending and segmenting
- Build phonemic awareness (involves identifying sounds in spoken words)
- Build in time for clarification questions related to missed or misheard items
- Don't penalize for spelling errors
- Annunciate sounds in words in an emphatic manner when teaching new words for reading or spelling
- Repeat or rephrase key information
- Provide guided notes during note taking activities
- Shorten instructions
- Provide extended time for testing

Preparation

- Provide written homework instructions and a homework list for the week
- Have the student read and become familiar with material before it is taught in class
- Provide a list of key vocabulary and concepts before upcoming lessons.

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Remediation

The Orton-Gillingham Approach to reading instruction was developed in the early-20th century and is an effective methodology for remediating deficits in this area. It is language-based, multisensory, structured, sequential, cumulative, cognitive, and flexible

Reading Intervention Programs Utilizing this Approach:

- Wilson Reading
- Barton Reading
- Saxon Phonics
- All About Reading

Software-based Orton Gillingham reading program options:

- Earobics
- Fast ForWord Early Literacy
- HearBuilder
- Lexia Reading

Learning Functions of the Brain

Educational Area: Acquired knowledge; general information; knowledge; vocabulary

Technical Area: Crystallized Intelligence

What it Means:

Crystallized Intelligence refers to a student's accumulated knowledge that has been built over time, beginning in infancy. It is like your own personal library of everything you know. Crystallized Intelligence involves knowledge of one's culture (i.e. Who is the President of the United States?) as well as verbal or language based knowledge that has been developed during general life experiences, and formal schooling (i.e. understanding words and their meaning, understanding street signs, knowledge of current events and the history of the United States). Having well developed or good Crystallized Intelligence means that the student understands and uses language well, has average or better vocabulary, has good listening skills, and is able to use language well via verbal expression.

How it Connects to Learning: Children with Crystallized Intelligence Weaknesses will have difficulties with vocabulary and knowledge acquisition, difficulties finding the right words to use or say, using prior knowledge to support learning, and difficulties comprehending language or understanding what others are saying.

- More specifically, in **reading**, children struggle with decoding (i.e. word student is attempting to decode is not in his/her vocabulary) and comprehension (i.e. poor background knowledge about information contained in text)
- In **writing**, children demonstrate poor grammar (syntax), bland writing with limited descriptors, verbose writing (wordy) with limited descriptors and inappropriate word usage
- In **mathematics**, they demonstrate difficulty understanding math concepts and math vocabulary
- In the area of **language**, children demonstrate difficulty with expressive language and understanding class lessons

Strategies to Support:

- Provide an environment rich in language and experiences
- Frequent practice with and exposure to words
- Read aloud to children
- Vary reading purpose (leisure, information)
- Work on vocabulary building
- Activities to build listening skills
- Explicitly teach listening strategies

The following websites contain engaging games and activities to help children improve on their Crystallized Intelligence Skills

• <http://jumpstart.com/parents/worksheets/reading-worksheets>

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- <http://www.vocabulary.co.il/english-language-games/>
- <http://techmatrix.org/>

Learning Functions of the Brain

Educational Area: Learning, storing, and retrieving information; long-term memory

Technical Area: Long-Term Storage and Retrieval

What it Means: Long-Term Retrieval is the ability to store, consolidate, and retrieve information over periods of time measured in minutes, hours, days, and years. **Impacts the input-associating new information with prior learning and with output-retrieving the information when needed.**

How it Connects to Learning: It is the efficiency with which information is initially stored in and later retrieved. Storage and Retrieval tasks can impact a child's **Associative Memory** - the ability to learn and remember the relationship between unrelated items. **Meaningful Memory** - the ability to remember narratives and other forms of semantically related information and **Free Recall Memory** - the ability to recall lists in any order. If someone says, "It's on the tip of my tongue," they are having a hard time retrieving something they know.

Reading Difficulties:

- Children will be slow to access phonological representations
- Difficulty being able to associate a letter shape to its name and its sound
- Can impact reading fluency
- Student will have difficulty retrieving or paraphrasing what one has read
- Student will have difficulty retrieving background knowledge to support new learning

Math Difficulties:

- Memorization of math facts
- Rapid retrieval of numbers
- Recalling of math procedures
- Forgets steps in algorithms and have a hard time when solving multi-step word problems

Writing Difficulties:

- Finding words to use when writing
- Generating ideas when writing
- Difficulties with compare/contrast writing task

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Strategies to Support:

- Organize material to be learned using visual aids (diagrams, flowchart, auditory aids)
- Frequent practice and exposure (flash cards)
- Chunking Information
- Introduce only as many facts, words, etc., as the student is able to learn in a session
- Pair written or visual with verbal information
- Introduce new concepts gradually with a lot of context
- Use study guides and review sheets
- Make connections by relating material to be learned to oneself
- Visual reminders (Post-its, color coded system)
- Desk organizers, Word walls

Learning Functions of the Brain

Educational Area: Thinking and manipulating visual patterns and visual stimuli

Technical Area: Visual Processing

What it Means:

Visual processing is the process of recognizing and interpreting information taken in through the sense of sight. **Difficulties with visual processing affects how visual information is interpreted, or processed by the brain.** This is different from problems involving sight or sharpness of vision.

Visual processing include:

- Seeing differences between things (discrimination)
- Remembering visual details (visual memory)
- The ability to identify a whole figure when only fragments are presented. Filling in missing parts in pictures (closure)
- Visual motor coordination (eye hand coordination)
- Visualization and imagination (sequential memory)
- The position of objects in space, the ability to accurately perceive objects in space with references to other objects (e.g., figure reversals or rotation) (spatial-relations)
- The ability to identify an object from a complex background or surrounding objects (Figure-ground)

How it Connects to Learning:

Students with a general visual processing disability often experience most learning difficulty in the areas of math and spelling because they have trouble “visualizing” words, letters, symbols, etc. Specific difficulties may include:

Writing

- Poor handwriting
- Poor spelling (difficulty visualizing words)

Math

- Difficulty visualizing problems
- Difficulty with cluttered worksheets

Reading

- Slow speed
- Poor comprehension

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General

- Poor organization/planning/neatness
- Difficulty rechecking work for accuracy
- Difficulty learning by demonstration
- Difficulty learning by video/visuals

Reading and math are two subjects where accurate perception and understanding of **spatial relationships** are very important. Both of these subjects rely heavily on the use of symbols (letters, numbers, punctuation, math signs). Examples of how difficulty may interfere with learning are in being able to perceive words and numbers as separate units, directionality problems in reading and math, confusion of similarly shaped letters such as b/d.p/q.

Strategies to Support:

1. **Concern:** Struggles with directionality concepts. Confuses left and right. Has trouble with math work.
Strategy/Intervention: Extending thumb and index finger of left hand creates letter L. **Encourage wearing bracelet on right hand. Label left and right side of student's desk.**
2. **Concern:** Doesn't start and stop at margins; crowds words at the end of lines or leaves too much space. May not write on line.
Strategy/Intervention: Have student use width of finger as quick guide to begin paragraphs: can also be used at end of line. Draw lines for student if none are present; help student see where he is to begin heading, etc. in order to allow for margins. Draw a model of what you expect of student. Use graph/box paper. **Use 3-lined paper. Darken border lines.**
3. **Concern:** Loses place while reading, uses finger.
Strategy/Intervention: Allow student to use marker above line. **Use index card under line of text.**
4. **Concern:** Has trouble spacing numbers in math: lining up columns; calculations may overlap
Strategy/Intervention: Have student turn paper horizontally to make use of vertical lines or use graph paper.
5. **Concern:** Misforms letters of similar configuration (i.e. quits-guits, false-jaits, size-size)
Strategy/Intervention: Use color-coding to aid in directionality. Allow him to practice on whiteboard with large arm movements. **Provide visual model for difficult letters.**
6. **Concern:** Has difficulty storing and retrieving information he has been exposed to
Strategy/Intervention: Use memory devices such as mnemonics, chains of visual picture associations, associative thinking, etc.

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7. Concern: Unable to remember events in a series (Social Studies, time lines)
Strategy/Intervention: Use a “walk-through” method. Use oral presentation, small group of whole class discussion.
8. Concern: Misplaces belonging on a regular basis. **Color code folders by subject.**
Strategy/Intervention: Develop a system for storing personal equipment, organize notebooks; one special section for homework. Require consistency in placement of name and heading on all assignments
9. Concern: When recalling items in the middle of a series, student must go back to the beginning (alphabet, months, etc.)
Strategy/Intervention: Use visual sequencing activities. Ask before and after questions. Encourage attention to logical divisions or breaks in any series.
10. Concern: Student struggles to visualize or picture word problems (imagery)
Strategy/Intervention: Use role-play. Ask probing questions which lead to main idea. Have student draw a picture about what he has read.
11. Concern: Student is slow in completing written work
Strategy/Intervention: Be willing to reduce amount of “copy” work and/or length of assignment. Eliminate time limits whenever possible. Allow oral presentation as an alternative. **Consider multiple choice or short answer responses.**
12. Concern: Has trouble with geometric drawings. Becomes anxious when required to draw
Strategy/Intervention: Provide structure (left to right, top to bottom). Use graph paper as a guide
13. Concern: Visual Sequencing. Problems in using a separate answer sheet. Loses place easily. Problems with reading. Reversing or misreading numbers or letters. Reading words incorrectly. Difficulty with equations.
Strategy/Intervention: Read directions aloud. Provide oral instruction. Write on the webcam. Color code things written down. When writing questions on the whiteboard, change color with every other question.
14. Concern: Dysgraphia. Inability to form letters correctly – student has difficulty reading their own writing.
Strategy/Intervention: Oral tests. Audio record projects/assignments. **Word processing. Word prediction.**
15. Concern: Visual Memory. Difficulty remembering what was seen. Reading comprehension. Difficulty with math equations. Poor recall of information.
Strategy/Intervention: Provide handouts that are clearly written. Provide oral instruction

Other recommendations:

- Use an index card when reading to blot out other words.
- Cut a “window” out of paper or index card to blot out surrounding words
- Allow for computer use
- Provide individual written outlines so there are fewer steps to process

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- Simplify math handouts, even printing on graph paper to help visually organize the space, or limit the amount of information per page.
- Make a “window card” or piece of paper with a square/rectangle cut out that can be placed on books or worksheets to limit the amount of information in the visual field.
- Keep work areas free of visual disorder, by removing unnecessary clutter from view
- Pair student with an auditory learner
- Present small amount of printed material on a page

Learning Functions of the Brain

Educational Area: Remembering immediate information

Technical Area: Short-Term Working Memory

What it Means: **Short-Term Memory** is the ability to apprehend a limited amount of information, maintain that information in our immediate awareness (for less than 30 seconds), and if needed, perform mental operations with that information to solve a problem. It acts as our “scratch-pad” for information that has been just taken in. This information disappears quickly so we must make a conscious effort to keep in our “holding area” when we need do something with it, otherwise is simply disappears forever. Imagine that you are trying to remember a phone number. The other person rattles off the 10 digits, you make a mental note but seconds later you realize you can only remember the area code. Without rehearsing it enough times until we can commit it to our long-term memory, or quickly jotting it down in our cell phones, the information deteriorates and is lost from our short-term memory. The working memory aspect is the aspect of holding onto information, either previously learned or new, in short-term memory long enough to do something the information.

How it Connects to Learning:

Short-term memory deficits can manifest themselves in the following areas:

Reading Difficulties

- Decoding Multisyllabic words
- Oral retell of what was read
- Understanding what was read

Math Difficulties

- Rote memorization of math facts
- Remembering mathematical procedures
- Multi-step problems and regrouping
- Extracting key information in word problems

Writing Difficulties

- Spelling multisyllabic words
- Redundancy in writing
- Identifying main idea of a story

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- Note Taking

Strategies to Support: Since our short-term memory is finite, strategies to support short-term memory emphasize limiting the elements of information that are pulling on our capacity (size), and the number of mental operations that students are required to perform. Interventions for short-term memory include the following:

General

- To increase the likelihood of having information move from short-term memory into long-term storage, teachers should activate students emotions; the stronger the emotions connected to an experience the stronger the memory.
- Learning experiences where social-emotional memories are part of the learning event are powerful memory enhancers, which is why cooperative learning is an effective teaching tool.
- To supplement oral instruction provide lecture notes, guided notes, study guides, and written directions.
- Have students use chunking strategies

Reading

- Prime the memory prior by discussing the vocabulary and the overall topic before a reading comprehension task is given. This will allow them to focus on the salient information and engage in more effective depth of processing.
- Teach students to be active readers by encouraging students to underline, highlight, or jot key words down in the margins
- To consolidate this information in long-term memory, have students make outlines or use graphic organizers.
- Use meaningful stimuli to assist with encoding of new vocabulary and allow for experiential leaning opportunities.

Math

- Provide math procedural outline for students in the form of a notecard for student to use when approaching a math problem.
- Have student write all steps and show all work for math computations.
- Provide visual support (i.e. times table) to support acquisition of basic math facts.
- Have student highlight important information in a math problem.
- During math computation, have student write down all steps and show work.

Writing

- Utilizing writing strategies that emphasize drafting first (i.e. graphic organizers, outlines).

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Educational Area: Fluency

Technical Area: Processing Speed

What it Means: Processing Speed is also known as cognitive efficiency or cognitive proficiency. It involves the ability to automatically and fluently perform relatively easy or over-learned cognitive tasks, especially when high mental efficiency, specifically, attention and focused concentration, are required. It relates to the ability to process information quickly and fluently, without intentional thinking through.

How it Connects to Learning: A student with processing speed needs has difficulty in performing simple cognitive tasks fluently and automatically, especially when focus and concentration is required. Students with processing speed needs may take more time to:

- Recognize simple visual patterns and in visual scanning tasks
- Take tests that require simple decision making
- Perform basic arithmetic calculations and in manipulating numbers, since these operations are not automatic for them
- Perform reasoning tasks under time pressure
- Make decisions that require understanding of the material presented
- Read silently for comprehension
- Copy words or sentences correctly or to formulate and write passages

Strategies to Support:

Instructional Strategies:

The key instructional strategy for students with slow processing speed is to reduce the time pressure associated with a task. This can be done in three essential ways:

Give the student more time for their work.

- Allow longer response time for the student to
 - respond orally to questions in class
 - complete seatwork assignments in class
 - make decisions when offered a choice of activities
- Allow extra time for tests, usually time and a half
- Provide extra time for the student to complete in-class assignments

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- Reduce the amount of work the student is required to do.
- Shorten the assignment so it can be accomplished within the time allotted
- Focus on quality of productions, rather than quantity
- Shorten drill and practice assignments that have a written component by requiring fewer repetitions of each concept
- Provide copies of notes rather than requiring the student to copy from the board in a limited time

Build the student's efficiency in completing work through building automaticity.

- Provide instruction to increase the student's reading speed by training reading fluency, ability to recognize common letter sequences automatically that are used in print; and sight vocabulary
- Provide timed activities to build speed and automaticity with basic skills, such as:
 - reading a list of high-frequency words as fast as possible
 - calculating simple math facts as fast as possible
 - learning simple math calculations through flash cards and educational software exercises
 - charting daily performance for speed and accuracy

Train the student in time management techniques to become aware of the time that tasks take.

- Teach the student to use a stopwatch or to record his or her start and end times for assignments to monitor the time spent on each activity. Set a goal for the student to gradually reduce the time needed to do these tasks

Assessment Strategies:

Assessment strategies emphasize power tests that focus on the knowledge the student has, rather than on speed tests to complete a large number of questions within a limited time.

- Emphasize accuracy rather than speed in evaluating the student in all subject areas
- Replace timed tests with alternative assessment procedures
- Allow extra time for tests and exams. Give the student supervised breaks during the test
- Provide a reader or text-to-voice software to read test questions to the student to accommodate for slow reading fluency
- Provide a scribe or voice-to-text software to record the student's answers on tests to accommodate for slow writing fluency
- Use test formats with reduced written output formats (i.e. multiple choice, True / False, fill in the blank) to accommodate for slow writing fluency

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