Cognitive Functioning and Psychological Processing

Definitions, Areas of Impact, and Recommended Strategies/Accommodations

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Fluid Reasoning

Fluid reasoning is the ability to think flexibly and problem solve. This area of reasoning is most reflective of what we consider to be general intelligence. Gifted students often have strong fluid reasoning skills.

Specifically, fluid reasoning refers to the mental operations that an individual uses when faced with a relatively novel task that cannot be performed automatically. Fluid Reasoning includes nonverbal reasoning, sequential and quantitative reasoning, and categorical reasoning.

Sequential reasoning- the ability to start with stated rules, premises, or condition and to engage in one or more steps to reach a solution to a problem.

Quantitative reasoning- the ability to inductively and deductively reason with concepts involving mathematical relations and properties.

Areas of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General	General Strategies
- Difficulty understanding relationships between new concepts - Difficulty generalizing or making connections between new material and acquired knowledge - Limited problem solving skills in new and everyday situations - Difficulties seeing the big picture and how things relate to each other - Problems understanding and evaluating opinions/views of others - Problems troubleshooting and figuring out how things works	- Explicitly teach multiple approaches to solving problems - Define relationships and connections between ideas in a concrete way - Provide analogies that the student can relate to - Provide opportunities to sort, classify, and categorize - Use teacher demonstrations with a think-aloud procedure followed by guided practice with feedback - Make use of graphic organizers to assist in unifying information and breaking information apart - Teach problem-solving strategies - Use cooperative groups and reciprocal teaching to help with perspective taking and exposure to different problem solving methods - Integrate visual and verbal information to enhance learning - Use a problem solving planner that sequences the questions that need to

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	be asked when approaching a problem
Math • Problems with a variety of concepts including number sense, estimation, fractions, integers, etc. • Difficulty in applying math skills in different areas. • Difficulty with determining the best solution to a word problem • Difficulty representing a problem in an equation • Difficulty representing numbers or problems in a variety of ways	**Math Strategies** • Model problem solving through talking aloud • Teach math mnemonic strategies that specifically identify the steps for solving problems • Teach patterns and relationships such as skip-counting or patterns on 100s chart to help learn multiplication facts • Attach number-line to desk to help with number sense and pattern recognition • Specifically teach the way a number or problem can be represented • Provide manipulatives in order to help make information concrete and less abstract • Have students explain their strategies when problem solving to expand solving options • Require the student to show their work
Reading/Reading Comprehension • Poor inferential/predictive skills while reading • Weak ability to grasp the main idea • Struggles with evaluating a writer's point of view and purpose	**Reading/Reading Comprehension Strategies** • Use graphic organizers to help summarize information • Model self-monitoring skills while reading, demonstrating how to stop and ask oneself if material/words have been understood • Teach cues for identifying main ideas such as looking for transition words
Writing • Struggles with the establishment of a purpose and perspective when writing • Difficulty organizing thoughts in a manner that will effectively communicate ideas • Weaknesses within creative writing	**Writing Strategies** • Use graphic organizers to help sequence information for effective communication • Model brainstorming for generation of ideas • Explicitly teach about genres and writing to an audience • Present models of good writing with guidance in determining why the

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• Difficulty taking the perspective of one's audience	writing was effective for its purpose
	Accommodations • Provide an outline of content to be covered in the lesson. • Adjust difficulty in level of materials to child's ability level – Concepts should be thoroughly explained with numerous examples. • Allot sufficient time for review and practice, as well as time to share and discuss ideas.

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Verbal Reasoning and Knowledge

(Crystallized Intelligence)

Verbal reasoning and knowledge generally reflects one's vocabulary and overall knowledge of the world. A variety of experiences and exposure to education influences development in this area.

Specifically, verbal reasoning and knowledge refers to the breadth and depth of a person's acquired knowledge of a culture and the effective application of this knowledge. It includes vocabulary development, verbal reasoning, language skills as well as the ability to listen, comprehend, and express oral communication.

Novel reasoning and problem solving; ability to reason, form concepts, and solve problems that often include novel information or procedures. It is basic reasoning processes that depend minimally on learning and acculturation.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General	General Strategies
• Lack of background information to relate new material across subject areas • Weak vocabulary that will impact listening and comprehension skills • Difficulty remembering facts due to lack of ability to relate the new information to background knowledge • Gaps in skills across areas due to knowledge and acquisition being dependent on exposure to information or specific curriculum • Difficulty drawing inferences • Problems finding main idea of passages • May provide off topic or "random" responses to questions • Difficulty generalizing ideas and vocabulary to new concepts • Difficulties with oral expression, including word retrieval and organization of thoughts • Difficulty using precise language to effectively communicate ideas	• Repeat skills and vocabulary • Use mnemonics to help retrieve knowledge • Pre-teach vocabulary • Use a quick vocabulary book or reference wall • Relate information to prior knowledge • Chunk information • Create a language and experience rich environment (e.g., label items in the house, name sights on the road, talk through activities, etc.) • Systematically teach new vocabulary • Teach key verbs, such as those in the GCCC, that appear in questions (e.g., demonstrate, analyze, synthesize) • Provide specific vocabulary instruction such as the meaning of common prefixes, suffices, and root words • Incorporate interests and prior knowledge areas into instructional activities • When presenting directions and discussing concepts, use vocabulary that is

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	understood by the individual
Math • Weaknesses in learning and identifying math vocabulary • Difficulty with word problems in general depending on the complexity of language used • Difficulty determining operations in word problems • Problems understanding the relationships between number symbols and words • Difficulty retrieving math facts due to the weaknesses in automatizing the relationship between numbers and words	Math Strategies • Teach math vocabulary • Convert story problems to visual representation • Teach synonyms for math vocabulary (e.g. sum = add = plus)
Reading/Reading Comprehension • Limited vocabulary will impact comprehension in a variety of ways including inferencing, summarizing, grasping main idea, etc • Weak reading fluency because of poor word retrieval • Poor comprehension due to limited vocabulary and integration of verbal concepts • May respond inappropriately by providing an answer that does not match the question	Reading/Reading Comprehension Strategies • Pre-teach vocabulary • Read for different purposes (including pleasure reading)
Writing • Poor vocabulary can result in redundant word use during writing • Difficulty using expressive language • Limited content due to lack of exposure to various resources and experiences	Writing Strategies • Use word bank • Use graphic organizers • Model brainstorm activities
	Accommodations • Provide copies of notes (During lecture to follow along or after class to

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	supplement student notes)
- Provide outline or cloze notes for students to fill in.
- Preferential seating to enhance monitoring of comprehension
- Check in with the student to ensure comprehension of task demands
- Use organizers when writing or reading to help expressive skills and comprehension
- Provide study guides
- May need extended time for reading or writing tasks
- Rephrase instructions or questions
- Allow "think time" when responding to questions
- Use visual aids (e.g., story maps, formulas, etc.)
- Highlight key words or facts
- Ensure that test items do not include vocabulary which has not been or is not familiar to the student
- Provide resources (create a language/vocabulary book) from which the student can draw information for discussion or written expression
- Provide oral communication that is individualized, clear, concise language, and vocabulary that is comprehensible

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Memory
Memory is the ability to store and recall information. Memory includes long-term, short-term and working memory.

Short-term Memory- The ability to recall information after a few seconds.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty remembering multi-step verbal directions • Problems remembering a series of information • Difficulty with the initial mastery of material • Difficulty with vocabulary development • Problems copying information • Weaknesses in transferring information from source to source • Difficulty answering questions directly from text • Problems writing dictated information	General Strategies • Deliver information in smaller units or portions • Use multimodal presentation of information (visual, tactile, and auditory) • Use stepwise approach to studying • Use rehearsal strategies (e.g., rhymes, acronyms, anagrams, associations) • Model re-telling, paraphrasing, and summarizing • Use lists, notes, checklist, or memory plans • Teach chunking strategies
	Accommodations • Allow the use of a number line or calculator • Provide copy of notes and outlines for notes • Write on tests or materials to eliminate transfer errors • Use repetition of instructions and information

Working Memory- Ability to temporarily store and perform a set of cognitive operations on information that requires divided attention and the management of limited capacity of short-term memory. It is a conscious process that involves the manipulation of information. Working memory is one of the most fundamental processes in learning.

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Through working memory, one connects input to output, as well as prior knowledge to new information. It thus affects one's ability to encode new information into long-term memory in all areas.	
Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty following multi-step directions • Failure to use strategies while studying • Difficulty paraphrasing and summarizing information • Difficulty with vocabulary development	
Math • Difficulty with multi-step problems • Weaknesses with keeping track of steps within math problems (e.g.,,. long division, equations) • Difficulties with mental math	Math Strategies • Provide a stepwise plan to follow during multiple-step problem solving or procedures (e.g.,. during regrouping, division) • Verbalize while solving problems and summarize at strategic points • Teach use of a number line or calculator • Use mnemonic techniques (e.g. PEMDAS: Parentheses, Exponents, Multiply, Divide, Add, and Subtract for order of operations) • Provide visual model of multi-step problem • Explicitly teach a problem solving model (e.g., QDPAC: Question, Data, Procedure, Answer, Check) • Use visual organizers
Reading/Reading Comprehension • Difficulty remembering sounds/words when decoding resulting in poor reading fluency • Weak reading comprehension due to poor decoding skills which limit overall memory resources • Low fluency due to poor monitoring of the context of words	Reading/Reading Comprehension Strategies • Encourage automatization of sound-symbol associations • Build sight word vocabulary • During reading comprehension tasks, use active reading techniques such as underlining, using a highlighter, re-reading, marking important parts, writing on margins of books, using sticky notes while reading, reading to a

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• Problems with simultaneously remembering a comprehension question and integrating information from the passage	tape recorder and listening to what was read • Review prior knowledge before teaching new information • Check for comprehension at strategic points • Have students take turns making/asking questions and responding to questions about material being taught • Use graphic organizers • Model self-monitoring for comprehension
Writing • Difficulty tracking what the student is writing • Problems organizing thoughts in writing • Problems integrating organization and grammar • Difficulties sequencing ideas	Writing Strategies • Use graphic organizers • Have word bank available • Use a tape recorder to record ideas prior to writing them • Teach self-monitoring for organization and grammar • Assistive technology – draft builder, co-writer
	Accommodations • Allow for use of a calculator, written formulas, or math fact list to decrease the student's need to rely on mental computations • Have fewer problems to complete, focusing on accuracy • Allow the use of a word processor for easier editing • Provide visual/written output of lectures so that the student can follow along and take additional notes • Allow students to create a 'cheat sheet' to be used during various assessments • Attention cues, simplify directions & explanations; concept maps, color code, parallel assignments, books on tape, copy of notes, written and verbal assignments and directions

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Long-Term Memory and Retrieval
Memory is the ability to store and recall information. Memory includes short-term, long term, and working memory. Ability to store information and fluently retrieve new or previously acquired information from long-term memory. Includes the ability to absorb newly presented information and to demonstrate subsequent acquisition of such information.
Long-Term Memory- The ability to take and store a variety of information (ideas, names, concepts) in one's mind, then later retrieve it quickly and easily using association.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General - Perform poorly when reviewing past material - Perform poorly when asked to complete a variety of problems on several different concepts - Can't easily retrieve needed information from long-term memory - Forgets steps in algorithms such as long division, and have a hard time when solving multi-step word problems - Have difficulties placing information in short-term memory and thus have problems later retrieving if from long-term memory - Weaknesses in transferring information from source to source - Have difficulties in matters related to time - Might do well on daily quizzes, but has difficulty passing chapter exams containing these materials - Difficulty remembering the writing process - They understand new information in class, but are uncertain how to proceed once they leave class	General Strategies - Provide over-learning - Provide review and repetition - Provide immediate feedback - Teach memory aids-Use rehearsal strategies (e.g., rhymes, acronyms, anagrams, associations) - Provide a list of steps that will help organize behavior and facilitate recall - Use lists, notes, checklists, or memory plans - Teach chunking strategies - Teach mnemonic strategies - Provide multi-sensory learning - Use visual, kinesthetic, vocal, and auditory channels as appropriate - Provide context and meaning-based instruction - Limit the number of new facts, words, and concepts in one session
	Accommodations Limit the amount of information to be learned during an instructional

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	session • Provide reference sheets • A calculator during math computation • Employ test formats that require recognition in favor of test formats that require recall • Emphasize concepts understood instead of memory for rote information in grading rubrics • Provide source of external memory • Check to ensure that the student has retained sufficient information to work independently

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Visual Processing

Visual processing refers to the manipulation and memory of what we see—not actual vision but problems in the processing of visual information by the brain

Visual processing is the ability to generate, perceive, analyze, synthesize, store, retrieve, manipulate, transform, and think with visual patterns. Visual processing includes understanding spatial relations, perceptual integration, spatial perception, figure-ground discrimination, and visual discrimination.

Visual discrimination- the ability to differentiate objects based on their individual characteristics.

Perceptual integration (part/whole relationship)- perceiving or integrating the relationship between an object or symbol in its entirety and the component parts which make it up.

A variety of skills associated with academics require spatial understanding of quantity, direction, interval, shape, location, size, direction of movement, sequence, and scale. These include: mathematics, spelling, punctuation and capitalization, mapping, understanding time, drawing, copying, ordering, changing point of view, and handwriting.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General	General Strategies
• Difficulty misunderstanding or confusing written symbols • Problems with being easily distracted by competing visual information • Difficulty judging distances (e.g., bumping into things, placing objects too close to an edge) • Difficulty with fluidity of movement (e.g., getting out of the way of a moving ball, knocking things over) • Trouble differentiating colors or similarly shaped letters and numbers • Difficulty identifying information from pictures, charts, graphs, maps, etc. • Weaknesses organizing information from different sources into one cohesive document • Difficulty finding specific information on a printed page (e.g., getting a number out of the phone book)	• Provide activities designed to develop discrimination of visual features (e.g., Where's Wally?, find the odd one out, find the hidden object, circle the same word in a text, word searches, find words with beginning with "t", ending with "ing" or containing "ou") • Give examples and point out the important details of visual information • Teach the cognitive-behavioral interventions of private speech (refer to SLP for suggestions) • Partially cover a picture and ask the student to identify the whole • Encourage the student to verbalize what he/she has seen (e.g., remembering routes around school may be easier if he/she has a verbal description in his head)

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• Problems remembering directions to a location • Weaknesses in recalling non-verbal experiences • Difficulty remembering an item, picture, symbol once it has been removed from view • Problems remembering the orientation of numbers or letters • Difficulty perceiving words and numbers as separate units • Problems with directionality in reading and math • Confusion of similarly shaped letters, such as b/d/p/q. • Difficulty ignoring irrelevant stimuli • Difficulty putting parts together to form a whole e.g. maps, three dimensional objects • Reversals when writing	• Model visual memory skills by showing the student a picture or card and asking them to remember what is on it. Remove it from view and ask for a detailed description of it or ask specific questions about the picture.
Math • Difficulty sequencing ideas • Weaknesses in organizing and solving math problems • Trouble with mathematical concepts related to understanding of size • Problems perceiving numbers as separate units • Problems telling time • Difficulty with geometry • Problems understanding fractions and part to whole relationships • Difficulty perceiving individual numbers accurately • Difficulty with regrouping or performing operations with multiple digits	Math Strategies • Teach student to verbalize the math problem • Use graph paper to aid in aligning numbers • Color coding

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Reading/ Reading Comprehension	Reading Strategies
• Difficulty finding and retaining important information in reading assignments or tests • Difficulty reading with speed and precision • Problems blending letters into words visually • Problems perceiving individual letters or words accurately • Weaknesses in noticing all the relevant words in a question, identifying key words or developing "skim and scan" skills • Although they may be able to read the individual letters they may struggle to put letters together to form words • Problems skipping lines of text • Difficulty tracking from left to right • Difficulty tracking (keep your space) while reading	• Teach student common visual patterns within words (e.g, prefixes and suffixes) • Teach student to key in on headings within texts
Writing	Writing Strategies
• Trouble staying within margins or on lines • Problems copying from the board or books • Difficulty writing neatly and quickly • Difficulty with spacing • Difficulty organizing written work • Weaknesses in labeling diagrams • Problems recognizing spelling patterns	• Teach proof-reading strategies (e.g., COPS) or use a proof-reading buddy • Before writing letters or essays, create an outline to simplify and organize ideas • Color code

Accommodations:

• Use books, worksheets and other materials with enlarged print
• Allow student to write answers on the same sheet of paper as the questions or offer opportunities for student to explain answers orally
• Provide a tape recorder to supplement note-taking
• Reduce the amount of visual information on a page

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- Use color-coding of materials
- Provide repeated exposures to printed visuals
- Provide graph paper for math problems to help with aligning problems
- Color code important information
- Read written directions aloud
- Provide paper for writing that has darker or raised lines to make the boundaries more distinct

Use a tracking tool as a reading guide (to keep focus on one line at a time) and a highlighter (immediately emphasize important information)

Template to isolate sentences or paragraphs in text; color overlays; minimize the number of written problems, orally assess student, copy of notes, use larger font on smart board; preferred seating, increase white space on paper, larger font; concept maps; verbal & written directions

Spatial perception- refers to the ability to accurately perceive objects in space with reference to other objects. It is the ability to discriminate right from left, top to bottom, and so on.

- Lose their place while working on a worksheet or when reading a text

- Hinders their ability to write in a straight line across the paper

- Impact the directional aspects of mathematics such as the ability to solve problems involving single-digit addition (up-down), regrouping (left-right), the alignment of numbers, or using a number line

- May have trouble with the concept of fractions as well as writing them, writing decimals, and find it hard to discern differences in size or shape.

Figure ground-. is the ability to identify an object from a background of other objects.

- These students lose their place on a page

- Mix up parts of different problems

- Have difficulty reading a calculator

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- Difficulty reading multi-digit numbers

- Difficulty copying symbols correctly

Visual discrimination- the ability to discern similarities and differences when comparing letters, numbers, and other objects. This includes distinguishing among common objects and symbols, color, form, shape, pattern, size, and position, as well as the ability to recognize an object as distinct from its surrounding environment.

- Can cause students to have trouble identifying symbol

- Difficulty gaining information from pictures, charts, graphs

- Difficulty using visually presented material in a productive way Trouble reading text, worksheets, or tests with too much information on one page

- Slow processing speed

- The may not be able to tell the difference between a quarter and a nickel, the numbers 6 and 9, and the small hand on a clock and the large one

- These issues can result in interference with many mathematics skills such as measurement, estimation, problem solving, and geometry.

- Overall: Difficulties reading out loud; loses their place in the text; will combine unrelated parts of sentences; copies problems or assignments incorrectly from the board; difficulty when taking math quizzes and tests – often uses information from one problem coupled with information from another problem on the same page to answer a questions; when setting up a number problem, they will often misalign numbers;

Reversals- two types – student reverses digits or letters, creating a mirror image of a single digit, and the second when a student reverses the digits of a two-digit number.

- Can cause problems with regrouping and transposing digits or letters.

Auditory Processing

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Ability to perceive, analyze, and synthesize patterns among auditory stimuli, and to discriminate subtle nuances in patterns of sound and speech when presented under distorted conditions.   It does not apply to what is received by the eardrum, or to deafness, or being hard of hearing.   Auditory processing includes phonological awareness, resistance to auditory stimulus distortion, and memory for sounds.

Phonological Awareness- Ability to break apart and blend sounds in words.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty understanding what is said • Articulation errors • Inability to hear different sounds in words would affect reading and spelling-Difficulty making out the teacher's voice against the background noise from other students and difficulty discriminating between sounds of spoke number in class • Difficulty paying attention in class • Difficulty hearing the teacher when other students are shuffling their papers, opening their notebooks, or making other noises • Difficulty remembering an assignment or task when told to orally • Oral drills are challenging for these students • Difficulty learning vocabulary presented orally • Slow processing speed	Strategies • Expose children to sounds, music, rhythms and language • Read aloud to the child • Read books that use a lot of rhyming words • Provide opportunities to explore and manipulate sounds, words, and language • Use decodable texts for daily practice • Listen to books on tape • Assistive technology for electronic reader (read out loud, start to finish, Bookshare)
Reading/Reading Comprehension • Inability to hear different sounds in words affects one's ability to assign sounds to letters (decoding) • Difficulties with Phonological Awareness activities-rhyming, alliteration, imitation, songs	Reading/Reading Comprehension Strategies • Provide Elkonin boxes (boxes that have the shape of letters for students to fill in) • Emphasize sound-symbol associations in teaching decoding and spelling • Use explicit, systematic, synthetic phonics instruction • Use a whisper box to allow the student to hear their own reading • Use direct phonics instruction

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	Example Programs: Fundations; Just Words; Road to the Code; Read,Write,Type; Wilson Reading; Explode the Code; Language!; REWARDS – multisyllabic words; multisyllabic words
Writing • Difficulty assigning sounds to letters hinders the development of accurate spelling • Difficulty with any type of dictation across all subject areas	Writing Strategies • Provide drill and practice for memorizing the spelling of words • Use Cover, Copy, and Compare strategies • Teach spelling using word groups and sorts
Math • Difficulty with using ordinal numbers	
	Accommodations • Allow the student to use books on tape/assistive technology/electronic reader, start to finish, book share • Check for comprehension after group directions are given • Provide a well-managed classroom with control of extraneous activities that create auditory distractions and competing background noise • Preferential seating that supports monitoring of student comprehension • Provide a peer assistant or buddy to provide information when the student did not understand an oral communication • Provide a modified spelling list • Use computer spell check • Provide student guides for listening activities • Provides assistance with note taking • Accompany oral information with visual materials • Read tests aloud to the student • Place marker or visual template • Use slow rate of speech, appropriate language/vocabulary, copy of notes, attention cues, mnemonics, extra time, tape recorder, provide both written

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	and verbal directions, simplify directions, concept maps, frequent feedback

Resistance to Auditory Stimulus Distortion- Ability to understand speech and language that has been distorted or masked in one or more ways.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty filtering out background noise • Problems understanding directions in lunch room, hallway, and playground • Difficulty in group work when more than one person is talking	Accommodations • Provide a quiet environment • Allow only one person to speak at a time • Require student to repeat directions back to you

Memory for Sounds- Ability to remember tones, patterns, and voices for short periods of time

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty remembering words and sounds within words • Poor spelling • Difficulty learning math facts due to impairment in the ability to remember and retrieve information stored in a verbal format	General Strategies • Use multimodal presentation of information (visual, tactile, and auditory) • Use rehearsal strategies (e.g., rhymes, acronyms, anagrams, associations) • Model re-telling, paraphrasing, and summarizing • Use lists, notes, checklist, or memory plans • Teach chunking strategies
	Accommodations • Allow the use of a number line or calculator • Provide copy of notes • Write on tests or materials to eliminate transfer errors • Use constant repetition of instructions and information • Deliver information in smaller units or portions

Long-Term Storage

Long-term storage refers to the ability to remember information and procedures that are used at some point after they are immediately taught.

Ability to store information and fluently retrieve new or previously acquired information from long-term memory. Includes the ability to absorb newly presented information and to demonstrate subsequent acquisition of such information.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty storing (encoding) and retrieving information • Difficulty retaining and retrieving information over time • Weak performance on classroom examinations • Problems with idea production, ideational fluency, associative fluency, and generation of a response • Difficulty relating and linking information together • Slow acquisition of new skills	General Strategies • Frequent review of information/facts • Pair new concepts or information to be learned with meaningful stimuli or overlearned material • Use mnemonic devices • Associate information with prior experiences and known information
Math • Poor recall of basic math facts • Poor recall of mathematical procedures	Math Strategies • Encourage use of a number line • Teach mnemonics for math procedures • Teach multiple strategies for calculating math facts • Teach Touch Math • Encourage the repetition of math facts through flashcards and computer programs
Reading/Reading comprehension • Weaknesses remembering letter-sound associations	Reading/Reading Comprehension Strategies • Help the student associate information with prior experiences and known

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• Difficulty relating material to previous knowledge, impairing reading comprehension • Recall of sight words	information • Focus on overlearning sight words
Writing • Poor memory for spelling • Difficulty coming up with ideas for writing	Writing Strategies • Provide topic lists to aid pre-writing brainstorming activities • Use structured organizers to aid in connecting multiple ideas • Help the student associate information with prior experiences and known information
	Accommodations: • Provide extended time on tests and completion of classroom tasks • Present questions prior to expecting a response • Give student cheat sheet of frequently used equations • Provide a word bank rather than require free recall of information

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Processing Speed

Processing Speed is how quickly one can perform cognitive tasks.

Ability to fluently and automatically perform cognitive tasks, especially when under pressure to maintain focused attention and concentration. Processing speed may include decision speed, rapid naming, and psychomotor speed.

Psychomotor speed: movements of the body associated with mental activity

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Slow in completing classwork and tests • Incomplete homework or tests • Difficulty working quickly and efficiently • Slower work rate • Difficulty responding to questions due to lag time • Lacks automaticity of rote information • Poor work completion • Difficulty scanning and quickly determining important information on a page • Slow decision making skills due to inability to free working memory	General Strategies • Allow time to respond orally or prepare student with question before calling on them • Self-monitoring strategies that focus students to set goals and rate their success related to timely completion of tasks • Explicitly teach student to increase speed and use concrete measures of progress using charts and graphs
Math • Difficulty working problems quickly on paper • Slow mental math skills • Low fluency related to math facts	Math Strategies • Use repetition of facts • Use computerized math programs that focus on increasing the automaticity of math facts • Practice with math facts using flashcards and incremental rehearsal of facts

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	• Use speed drills
Reading/Reading Comprehension • Poor reading fluency due to slow rapid naming skills • Slow word retrieval • Slow response time • Weak reading fluency impacts comprehension of text	Reading/Reading Comprehension Strategies • Model fluent reading by reading aloud • Use choral reading • Practice with sight words using flashcards and incremental rehearsal of facts • Use repeated reading of texts (3-5 times) • Encourage rereading of a text until speed criteria is met • Encourage a student to read two sentences/paragraphs and have the following student read the last sentence/paragraph read along with a new one • Utilize speed drills • Preview reading materials • Use books on tape to address fluency weaknesses *Example programs: Read Naturally, Great Leaps, Quick Reads, Read out Loud, Start to Finish*
Writing • Slow writing skills (motorically) • Struggles to quickly organize and complete written tasks • Low writing output • Resistance to writing tasks	Writing Strategies • Use short speed drills that emphasize output over grammar, spelling, and punctuation • Speech Recognition software
	Accommodations: • Access to word processor • Provide books on tape • Provide oral directions • Provide copies of notes, formatted which only key words need to be added

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	• Provide extended time • Reduce quantity of work in favor of quality • Shorten or chunk assignments (e.g., odds or evens, fold paper in half, etc.) • Use a timer to increase self-monitoring of output and speed of completion • Reduce and structure the amount of copying required from a book or board • Provide high-interest books on student's reading level • Provide resource folder
Note: Cognitive Efficiency has to do with both Processing Speed and Working memory and will determine how much and how efficiently a student will process information and thus learn it.	

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Executive functioning includes the brain-based functions that involve mental control and self-regulation. Executive functions area analogous to a maestro of an orchestra, while the rest of the cognitive processes comprise the band itself.

Executive functioning guides the management of our internal resources in order to achieve a goal. Cognitive components of executive functioning include attention control, cognitive flexibility, planning, goal setting, inhibition, and self-monitoring. Executive processing involves controlling or self-directing our cognitive resources and processing.

Inhibition- the ability to resist impulses and to stop one's behavior at the appropriate time.
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Attention Control- The ability to maintain attention to a situation or task in spite of distractibility, fatigue, or boredom. Difficulty maintaining concentration. Typical symptoms involve developmentally inappropriate levels of attention (predominantly inattentive, predominantly hyperactive-impulsive, combine—inattention, hyperactivity-impulsivity
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<tr><td>Area of Difficulty/Academic Impact</td><td>Recommended Strategies and Accommodations</td></tr>
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General

- Struggles with wasting time doing small project and fails to do big project
- Difficulty determining what material to record during note-taking
- Failure to complete tasks
- Engagement in distracted behaviors
- Inability to attend in stimulating environment
- Difficulty organizing and completing work correctly
- Writing is disorganized
- May give the impression that they are not listening or has not heard what has been said
- Work is often messy and performed carelessly and impulsively
- Difficulty maintaining attention to essential instruction
- Students may actually be attending to too many things at once
- Difficulty maintaining attention to steps in algorithms or problem
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General Strategies

- Use an incentive system to encourage student to remain on-task
- Use an "If-Then" plan to encourage student to remain focused on non-preferred task
- Teach student to use accommodations independently
- Self-monitoring checklists
- direct instruction of organization strategies
</td></tr>
</table>

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solving	
	Accommodations • Provide structured organizers for breaking projects into smaller parts • Provide outlines for note taking • Use a timer and encourage student to complete activity within time allotted • Plan student's schedule so that activities requiring the most focused concentration are during periods of the day that child is most focused • Provide quiet location for student to work • Attention cues, structured environment, color code, clear transitions, conferencing, check in check out, positive reinforcement

Cognitive Flexibility- The ability to think flexibly and be able to alternate attention to solve a complex or novel task (Selective Attention).

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty making transitions between tasks or within tasks • Difficulty coping with unforeseen events • Problems with perseverating on the same idea	General Strategies • Try to teach frameworks for "walking through" new situations and changes. This includes teaching self-talk as well as determining when to seek external assistance. • Model a range of ways of approaching a single task or situation • Teach brainstorming techniques • Provide a place for self-calming during stressful times and teach self-soothing techniques • Create visual cues for routines and schedules • Highlight changes and help the individual build a bridge from what he/she knows to what he/she does not know • Provide additional support during transitions when new concepts, tasks, or environments are introduced • Think alouds to model

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Math • Problems changing approach to a problem • Difficulties changing from one math operation to another	
Writing • Difficulty changing topic • Problems brainstorming creative ideas	
	Accommodations • Allow additional time to adjust to changes • Create consistent and predictable environments as much as possible

Planning- Ability to evaluate a task and plan a strategy to solve a problem and reach an answer.	
Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General • Difficulty completing tasks in a timely manner • Problems starting tasks without fully understanding what is required • Problems starting projects/tasks without necessary materials	General Strategies • Break down tasks into component parts and provide a checklist for each component • Plan out the project with a clear first step to provide an entry point for getting started • Work with the student to create a very specific list of the steps needed to complete the project and to plan the time line for completion of each step • Teach the student to enter steps into an agenda book as daily tasks • Offer organizational frameworks in advance that help students organize new material in their heads • Model problem-solving skills – think alouds • Walk through the planning process with the student and help him/her plan an approach to the task at hand – think alouds • Review assignments and model the planning process by talking it through

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	out loud Gradually switch to having the student lay out the plan while you take a coaching role helping only as much as needed *Computer software that is available: Inspiration, Kidspiration, MindJet, MindManager*
Math • Problems sequencing math steps	
Reading/Reading Comprehension • Problems previewing reading material	
Writing: • Struggles with disorganized and non-sequential writing • Difficulty making logical argument • Poor paragraph formation	Writing Strategies • Develop templates for repetitive procedures such as compare and contrast guides for papers • Use visual maps for brainstorming and organizing
	Accommodations: • Provide a packet about projects with a checklist of the steps and when they are due

Goal Setting- Ability to identify a goal and follow through to the completion of the goal.	
Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations

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General	General Strategies
• Individual seems "future-blind" (i.e., not working towards the future) • Difficulty setting mini-goals	• Break down tasks into component parts and provide a checklist for each component • Plan out the project with a clear first step to provide an entry point for getting started • Work with the student to create a very specific list of the steps needed to complete the project and to plan the time line for completion of each step • Teach the student to enter steps into an agenda book as daily tasks • Offer organizational frameworks in advance that help students organize new material in their heads • Model problem-solving skills – think alouds • Walk through the planning process with the student and help him/her plan an approach to the task at hand • Review assignments and model the planning process by talking it through out loud; gradually switch to having the student lay out the plan while you take a coaching role helping only as much as needed • Provide external structure and feedback in a sensitive and developmentally appropriate manner • Teach the use of tools and techniques to improve monitoring such as checklists for repetitive tasks • Highlight the process of self-review and analysis of behavior • Provide checklists to help the student monitory his/her performance • Have student set a goal and rate their performance

Inhibition- The ability to stop and think before acting and to resist the urge to respond to distracters. This ability allows one the time to evaluate a situation and how his/her behavior might affect it.

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General	General Strategies
• Difficulty with distractibility and or impulsiveness • Problems picking smaller, immediate reward over larger, delayed reward	• Provide external reinforcement for appropriate behavior and choices • Minimize distracters (e.g., handing out multiple page exercises one at a

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	time)
• Difficulty speaking before thinking	• Teach Stop and Think strategies • Cue the student as to expected behaviors and review class rules for each school environment
	Accommodations • Restrict access to settings or situations in which the child can get in trouble

Metacognition/Self-Monitoring- The ability to stand back and take a bird's eye view of one-self in a situation, includes the ability to assess one's performance and progress towards a goal.

Cognition and Metacognition Deficits:

Cognition as it refers to "understanding" is the ability to comprehend what you see and hear, and to infer information from social cues and body language. Metacognition emphasizes self-awareness of how one approaches a task in order to plan and monitor progress (thinking about your thinking)

Do not recognize that they are failing to understand what they are reading

Difficulty selecting the main idea

Difficulty summarizing

Lack of strategies to use when planning, writing and revising written expression

Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
General	General Strategies • Provide external structure and feedback in a sensitive and developmentally

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- Difficulty analyzing errors in order to improve future performance - Poor self-checking to insure that each step is completed - Problems with monitoring pace to determine if goal will be met on time - Problems checking work before submitting it - Difficulty completing tasks in given time - Lack awareness of basic skills - Lack awareness of strategies and resources to complete tasks - Trouble selecting appropriate strategies to solve problems - Difficulties identifying and selecting appropriate strategies - Difficulties organizing information - Difficulty monitoring problem-solving processes - Difficulty evaluating problems for accuracy - Difficulty generalizing strategies to new situations - Not able to adjust reading styles to accommodate the difficulty of the text	- appropriate manner - Teach the use of tools and techniques to improve monitoring such as checklists for repetitive tasks - Highlight the process of self-review and analysis of behavior - Provide checklists to help the student monitory his/her performance - Have student set a goal and rate their performance - Thinks alouds to model - Concept maps - Self-monitor - Conferencing - Positive reinforcement
	Math Strategies - Teach students to check answers by using the opposite operation - Teach students to check answers using estimation - Teach students to use a problem-solving strategy (e.g., QDPAC)
	Reading/Reading Comprehension Strategies Teach reading self-monitoring strategies (e.g., SQ3R, Click or Clunk)
	Writing Strategies Teach student to use a proofreading strategy (e.g., COPS)

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Initiation- The ability to begin projects without undue procrastination, in an efficient or timely fashion. The ability to begin or start a task.	
Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
<u>General</u> • Difficulty starting an assignment or project • Poor use of class time • Poor planning of when to start a task and starting it promptly at predetermined time Difficulty starting an assignment or project • Difficulty planning when to start a task and starting it promptly at predetermined time	<u>General Strategies</u> • Have student specify when he/she will begin task • Teach self-talk strategies (e.g., "I need to start working now.") • Use an incentive system to reinforce independent initiation of tasks • Create a visual cue to prompt the student to start working • Note start and stop times when tasks are assigned/completed

Organization- The ability to arrange or place things according to a system	
Area of Difficulty/Academic Impact	Recommended Strategies and Accommodations
<u>General</u> • Failure to have needed supplies	<u>General Strategies</u> • Provide external structure and feedback in a sensitive and developmentally appropriate manner • Highlight the process of self-review and analysis of behavior • Have student set a goal and rate their performance • Use of graphic organizers
<u>Math</u> • Problems organizing math problems	
<u>Writing</u> • Disorganized and non-sequential writing	

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• Difficulty making logical argument	
	Accommodations • Provide a second set of books • Create an organization system for student • Provide an adult to check in regarding organization • Self-monitoring checklist • Use of graph paper for math problems

Motor

Motor – motor skill deficiencies interfere with the ability to use and coordinate large and small body muscles in order to move and manipulate objects.

- Work often looks sloppy as if it was completed quickly and without much effort

- Inability to write clearly interferes with accuracy so written work may not reflect understanding

- Difficulties writing in small spaces

- Become fatigued after writing

- Pace, neatness, and copying are problematic

  Accommodations/General Strategies: minimize number of written problems, orally assess student, provide copy of notes, graph paper, extra time, tape recorder, increase white space, assistive technology- speech recognition software

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Expressive Language

Expressive Language- The production of language that is understood by and meaningful to others

- Inability to complete rapid oral drills

- Difficulty counting

- Difficulty explaining their thoughts orally

- Difficulty explaining how to complete a problem orally

- Uses incorrect grammar or syntax

- Lacks specificity

- Jumps from topic to topic

- Has limited use of vocabulary

- Difficulty finding the right word to communicate

- Uses social language poorly

- Is afraid to ask questions

- Has difficulty discussing abstract, temporal, or spatial concepts

- Often does not provide enough information to the listener

- Accommodations/General Strategies: concrete or pictorial representations, minimize number of written problems and/or written assignments, provide copy of notes, extra time, increase white space, require written and verbal communication, assistive tech – draft builder, co-writer

Receptive Language

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Receptive Language- The ability to understand what is meant by spoken communication.

- Difficulty relating words to meaning (connecting vocabulary words with an understanding of a mathematical concepts such as first and greater than)

- Difficulty with words that have multiple meanings

- Difficulty with writing notes or problems from dictation

- Difficulty following oral directions

- Difficulty solving word problems

- Become confused when irrelevant information is included in word problems

- Difficulty reading due to lack of comprehension of vocabulary

- Does not respond to questions appropriately

- Cannot think abstractly or comprehend abstractions as idioms

- Cannot retain information presented verbally

- Cannot recall sequences of ideas presented orally

- May confuse the sounds of letters that are similar

- Has difficulty understanding humor or figurative language

- Has difficulty comprehending compound and complex sentences

- Has difficulty comprehending concepts showing quantity, function, comparative size, and temporal and spatial relationships

- Accommodations/General Strategies: concrete or pictorial representations, slow rate of speech, use of appropriate language/vocabulary, structured environment, variety in lessons, mnemonics, extra time, tape recorder, written and verbal assignments and directions, copy of notes, simplify directions

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and explanations; analogies, concept maps, written and verbal communication, frequent feedback, color coded

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