Reading Disorders:
Evaluation and Intervention

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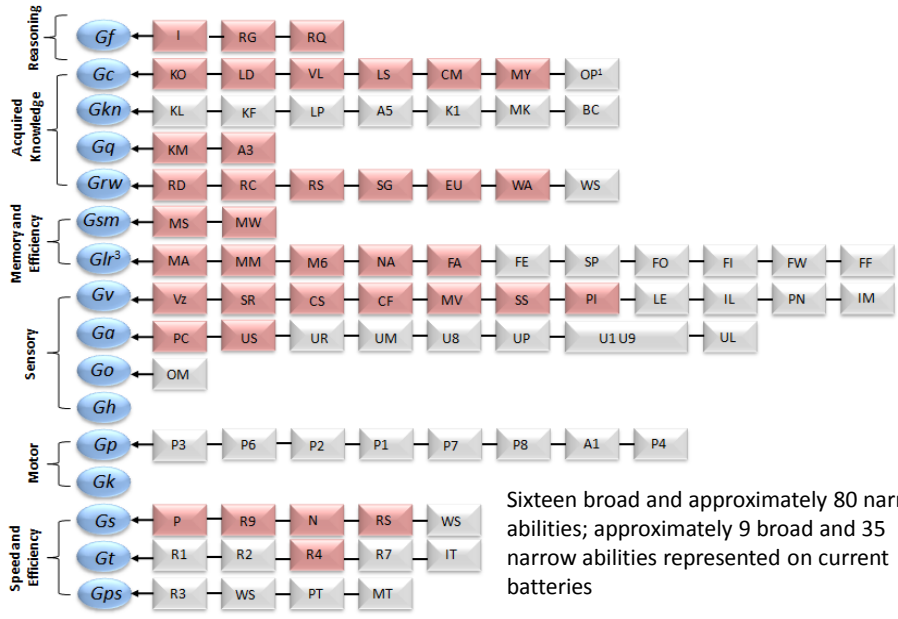
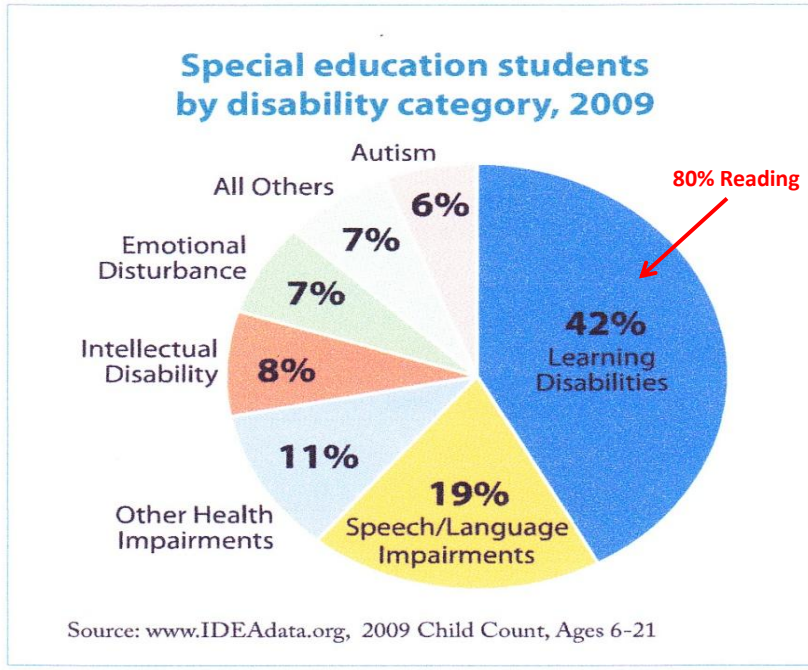
Today's Agenda

- Theory Guides SLD Evaluation and Intervention
- Subtypes of Reading Disorders
- Manifestations of Cognitive Ability and Processing Weaknesses
- Intervention: Modifications, Accommodations, Remediation, and Compensation
- Application of theory and Research in the Schools
  - Tailoring interventions
  - Using instructional materials wisely

Current and Expanded Cattell-Horn-Carroll (CHC) Model of Cognitive Abilities
(adapted from Schneider & McGrew, 2012)



Sixteen broad and approximately 80 narrow abilities; approximately 9 broad and 35 narrow abilities represented on current batteries



The five "big ideas" of the reading process (Grizzle & Simms, 2009)

1. Phonemic Awareness:	the ability to detect, manipulate, and process acoustical information in words
2. Alphabetic Principle:	associating sounds with letters, and blending graphemes into words
3. Reading Fluency:	the ability to automatically read words within text using minimal effort and with full comprehension
4. Vocabulary:	a working knowledge of word meanings also mapped to oral vocabulary
5. Reading Comp:	the ability to derive meaning from text

As cited in Feifer (2013).

Reading Disability Subtypes

- **Dysphonetic Dyslexia** – difficulty sounding out words in a phonological manner
- **Surface Dyslexia** – difficulty with the rapid and automatic recognition of words in print
- **Mixed Dyslexia –** multiple reading deficits characterized by impaired phonological and orthographic processing skills. It is probably the most severe form of dyslexia.
- **Comprehension Deficits** – the mechanical side of reading is fine but difficulty persists deriving meaning from print

Feifer, S. (2011). How SLD Manifests in Reading Achievement. In Flanagan & Alfonso (Eds), ***Essentials of Specific Learning Disability Identification*****. Hoboken, NJ: Wiley.**

Correspondence Between Diagnosis and Treatment

as syndromes/disorders become more discretely defined, there may be a greater correspondence between diagnoses and treatment

Kratochwill and McGivern's (1996; p. 351)

Selecting Interventions Based on Reading Disorder Subtype

Subtype	Brain relationship	Description of Disorder[2]	Intervention
Dysphonetic Dyslexia	*Supramarginal gyrus*, located at the juncture of the temporal and parietal lobes[1]	Difficulty sounding out words in a phonological manner; inability to use phonological route to bridge letters and sounds; over-reliance on visual or orthographic cues; tend to guess on words based on initial letters observed; typically memorize whole words	Intervention should include an explicit phonological approach, especially with younger children (e.g., Wilson Reading System; Fundations; Fast Forword; Earobics I). Modality based: Horizons (visual phonics approach). Lindamood (tactile cues). Secondary Level (morphological cues emphasized - Read 180)
Surface Dyslexia	Left *fusiform gyrus*[3]	Difficulty with the rapid and automatic recognition of words in print; can sound out words, but cannot recognize words in print automatically and effortlessly; letter-by-letter and sound-by-sound readers; over-reliance on phonological properties and underappreciation of orthographic or spatial properties of the word; reading is slow and laborious	Intervention should focus on automaticity and fluency goals (not necessarily an explicit phonological approach); build sight words. Early ages: Reading Recovery; Ages 7-12: Read Naturally; Over Age 12: Read 180; Wilson.
Mixed Dyslexia	Show weaker modulatory effects from the left *fusiform gyrus* to the left inferior pariental lobes, suggesting deficits integrating both the phonological representation and orthographical representation of words	Multiple reading deficits characterized by impaired phonological and orthographic processing skills. Most likely the most severe form of dyslexia; characterized by a combination of poor phonological processing skills, slower rapid and automatic word recognition skills, inconsistent language comprehension skills; bizarre error patterns in reading; *double-deficit*.	Intervention should incorporate a *balanced literacy* approach
Comprehension Deficits	The brain's *executive attention network* – modulated primarily by the *anterior cingulate gyrus* in the frontal lobes[4]	The mechanical side of reading is fine, but difficulty deriving meaning from print	Intervention should be at the *language* level, not the phonological level; externalize the reasoning process – Summarize, Clarify, Question and Predict

Better Understanding of the Problem Leads to Better Intervention Planning

What Parents and Teachers Should Know About Cognitive Abilities and Their Impact on Academic Skills and Academic Success

Summary of Relations between CHC Abilities and Specific Areas of Academic Achievement
(Berninger, 2013; Flanagan, Ortiz, Alfonso & Mascolo, 2006; McGrew & Wendling, 2010)

	Reading Achievement	Math Achievement	Writing Achievement
Gf	Inductive (I) and general sequential reasoning (RG) abilities play a moderate role in **reading comprehension.**	**Inductive (I) and general sequential (RG) reasoning abilities are consistently very important for math problem solving at all ages.**	Inductive (I) and general sequential reasoning abilities (RG) are consistently related to **written expression** at all ages.
Gc	**Language development (LD), lexical knowledge (VL), and listening ability (LS) are important at all ages. These abilities become increasingly important with age.**	**Language development (LD), lexical knowledge (VL), and listening abilities (LS) are important at all ages. These abilities become increasingly important with age.**	**Language development (LD), lexical knowledge (VL), and general information (K0) are important primarily after about the 2nd grade. These abilities become increasingly important with age.**
Gsm	Memory span (MS) and **working memory capacity.**	Memory span (MS) and **working memory capacity.**	Memory span (MS) is important to writing, especially **spelling** skills whereas working memory has shown relations with advanced writing skills (e.g., written expression).
Gv	Orthographic Processing – **reading fluency**	Visualization is important primarily for higher level or **advanced mathematics** (e.g., geometry, calculus).	Orthographic Processing - **spelling**
Ga	**Phonetic coding (PC) or "phonological awareness/processing" is very important during the elementary school years.**		**Phonetic coding (PC) or "phonological awareness/processing" is very important during the elementary school years for both basic writing skills and written expression (primarily before about grade 5).**
Glr	**Naming facility (NA) or "rapid automatic naming" is very important during the elementary school years.** Associative memory (MA) is also important.	Naming Facility (NA); Associative Memory (MA)	Naming facility (NA) or "rapid automatic naming' has demonstrated relations with written expression, primarily **writing fluency**.
Gs	**Perceptual speed (P) abilities are important during all school years, particularly the elementary school years.**	**Perceptual speed (P) abilities are important during all school years, particularly the elementary school years.**	**Perceptual speed (P) abilities are important during all school years for basic writing and related to all ages for written expression.**

Definitions of CHC Broad and Narrow Abilities

Broad Ability	Definition
Fluid Reasoning (Gf)	The deliberate but flexible control of attention to solve novel, "on-the-spot" problems that cannot be performed by relying exclusively on previously learned habits, schemas, and scripts.
Induction (I)	The ability to observe a phenomenon and discover the underlying principles or rules that determine its behavior.
General Sequential Reasoning (RG)	The ability to reason logically, using known premises and principles.
Quantitative Reasoning (RQ)	The ability to reason, either with induction or deduction, with numbers, mathematical relations, and operators.

Refinements: Piagetian Reasoning (RP) and Reasoning Speed (RE) were deemphasized, primarily because there is little evidence that they are distinct factors.

What is Fluid Reasoning (Gf)?

Fluid Reasoning (*Gf*) refers to a type of thinking that an individual may use when faced with a relatively new task that cannot be performed automatically.

- forming and recognizing concepts (e.g., how are a dog, cat, and cow alike?)
- identifying and perceiving relationships (e.g., sun is to morning as moon is to *night*)
- drawing inferences (e.g., after reading a story, answering the question, "What will John do next?")
- reorganizing or transforming information (e.g., selecting one of several pictures to complete a puzzle).

Relations between Gf and Reading Achievement

Gf – Induction (I) and general sequential reasoning (RG) play a moderate role in ***reading comprehension***

Definitions of CHC Broad and Narrow Abilities

Broad Ability	Definition
Crystallized Intelligence (Gc)	The depth and breadth and of knowledge and skills that are valued by one's culture.
General Verbal Information (K0)	The breadth and depth of knowledge that one's culture deems essential, practical, or otherwise worthwhile for everyone to know.
Language Development (LD)	General understanding of spoken language at the level of words, idioms, and sentences.
Lexical Knowledge (VL)	Extent of vocabulary that can be understood in terms of correct word meanings.

Additional Gc Narrow Abilities

Broad Ability	Definition
Crystallized Intelligence (Gc)	The depth and breadth and of knowledge and skills that are valued by one's culture.
Listening Ability (LS)	The ability to understand speech.
Communication Ability (CM)	The ability to use speech to communicate one's thoughts clearly.
Grammatical Sensitivity (MY)	Awareness of the formal rules of grammar and morphology of words in speech.

What is Crystallized Intelligence (Gc)?

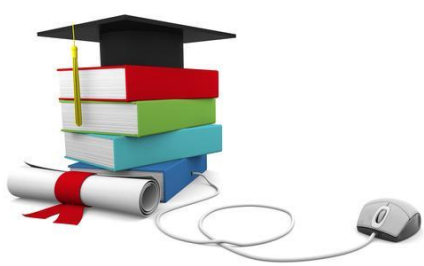
- a person's knowledge base (or general fund of information) that has built up over time, beginning in infancy.
- your own personal library or everything you know.

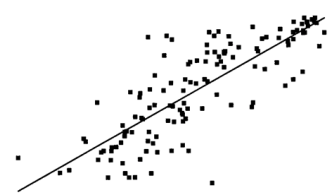
What is Crystallized Intelligence (Gc)?

- Having well developed or good Crystallized intelligence means that one understands and uses language well, has an average or better vocabulary, has good listening skills, and is able to use language well via verbal expression.

Relations between Gc Abilities and Reading Achievement

- ***Gc*** – Language development (LD), lexical knowledge (VL), general information (K0) and listening ability (LS) are important at for reading at all ages. *These abilities become increasingly important with age*





Definitions of CHC Broad and Narrow Abilities

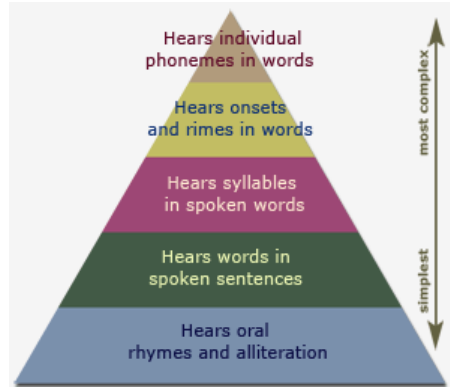
Broad Ability	Definition
Auditory Processing (Ga)	The ability to detect and process meaningful nonverbal information in sound.
Phonetic coding (PC)	The ability to hear phonemes distinctly.
Speech Sound Discrimination (US)	The ability to detect and discriminate differences in speech sounds (other than phonemes) under conditions of little distraction or distortion.
Resistance to Auditory Stimulus Distortion (UR)	The ability to hear words correctly even under conditions of distortion or loud background noise.

What is Auditory Processing (Ga)?

- Auditory processing (Ga) refers to the ability to perceive, analyze, and synthesize a variety of auditory information (e.g., sounds).
  - auditory processing include listening to words with missing letters and saying the correct word (e.g., hearing “olipop” and saying “lollipop”)
  - listening to piano music and identifying the key in which the piece is being played (e.g., C sharp)

Relations between Ga and Reading Achievement

- ***Ga*** – Phonetic Coding (PC) or phonological awareness; phonological processing – very important during the elementary school years.



Assessing Phonological Processing Related to Reading

- Examples of assessments of phonological processing directly related to reading:
  - PAL-II Rhyming, Syllables, Phonemes, Rimes
  - KTEA-II Phonological Awareness Subtest
  - NEPSY-II Phonological Processing Subtest
  - WJ III Sound Awareness, Sound Blending, and Incomplete Words Subtests
  - DAS-II Phonological Processing Subtest
  - CTOPP-II Blending and Segmenting Subtests

Definitions of CHC Broad and Narrow Abilities

Broad Ability	Definition
Short-Term Memory (Gsm)	The ability to encode, maintain and manipulate information in one's immediate awareness.
Memory Span (MS)	The ability to maintain information in primary memory and immediately reproduce the information in the same sequence in which it was represented.
Working Memory Capacity (MW)	The ability to direct the focus of attention to perform relatively simple manipulations, combinations, and transformations of information within primary memory, while avoiding distracting stimuli and engaging in strategic/controlled searches for information in secondary memory.

Revisions and Refinements to Gsm Domain

- In the area of **Gsm**, the name Working Memory (MW) was changed to *Working Memory Capacity*, as Schneider and McGrew believe this term is more descriptive of the types of tasks that are used most frequently to measure MW (e.g., Wechsler Letter-Number Sequencing).

Sample Items From The Letter-Number Sequencing Test

	Item	Correct response
LNS-Forward	9 – A – 6 – J – 3 – P	9 – A – 6 – J – 3 – P
LNS-Reordered	E – 1 – R – 8 – M – 7	1 – 7 – 8 – E – M - R

What is Short-term Memory (Gsm)?

- Short-term memory (Gsm) is the ability to hold information in one's mind and then use it within a few seconds.
  - holding a phone number in one's mind long enough to dial it.

  - Working memory is also part of the short-term memory system and involves manipulating or transforming information and using it in some way (e.g., saying the months of the year backwards).

Sample Items From The Letter-Number Sequencing Test

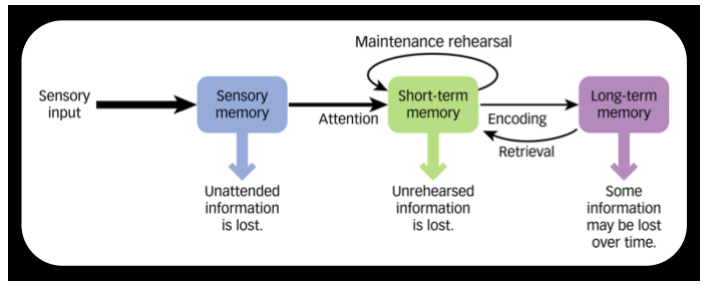
	Item	Correct response
LNS-Forward	9 – A – 6 – J – 3 – P	9 – A – 6 – J – 3 – P
LNS-Reordered	E – 1 – R – 8 – M – 7	1 – 7 – 8 – E – M - R

What is Short-term Memory (Gsm)?

- A child with short-term memory difficulties may have a hard time
  - Following directions
  - understanding long reading passages (e.g., a story read aloud by the teacher)
  - Spelling
  - sounding out words
  - and doing math problems (e.g., remembering the steps required to solve long math problems
- Children who have difficulties with short-term memory do better when they are *taught how to use strategies* to help them remember things.
  - Mnemonics

Relations between Gsm and Achievement

- ***Gsm*** – Memory span (MS) and working memory capacity are important for reading at all ages

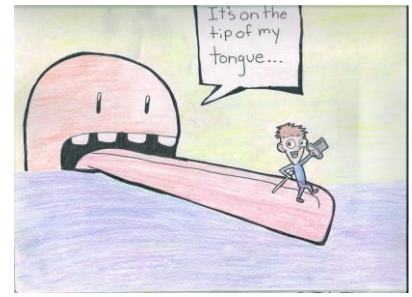


What is Long-term Storage and Retrieval (Glr)?

- Refers to an individual's ability to take in and store a variety of information (e.g., ideas, names, concepts) in one's mind and then retrieve it quickly and easily at a later time by using association.

What is Long-term Storage and Retrieval (Glr)?

- This ability does not represent *what* is stored in long-term memory or what you know. Rather, it represents the *process* of storing and retrieving information.
- When someone says, "It's on the tip of my tongue," they are having a hard time retrieving something that they know.



Definitions of CHC Broad and Narrow Abilities

Broad Ability	Definition
Long-Term Storage and Retrieval (Glr)	The ability to store, consolidate, and retrieve information over periods of time measured in minutes, hours, days, and years.

Learning Efficiency

Associative Memory (MA)	The ability to remember previously unrelated information as having been paired.
Meaningful Memory (MM)	The ability to remember narratives and other forms of semantically related information.
Free Recall Memory (M6)	The ability to recall lists in any order.

Additional Glr Narrow Abilities

Broad Ability	Definition
Long-Term Storage and Retrieval (Glr)	The ability to store, consolidate, and retrieve information over periods of time measured in minutes, hours, days, and years.
Retrieval Fluency	
Ideational Fluency (FI)	The ability to rapidly produce a series of ideas, words, or phrases related to a specific condition or object.
Word Fluency (FW)	The ability to rapidly produce words that share a non-semantic feature.
Figural Fluency (FF)	Ability to rapidly draw or sketch as many things (or elaborations) as possible when presented with a non-meaningful visual stimulus (e.g., a set of unique visual elements).
Naming Facility (NA)	The ability to rapidly name pictures, letters or objects that are known to the individual.

Schneider and McGrew's Conceptualization of Gsm and Glr in Contemporary CHC Theory

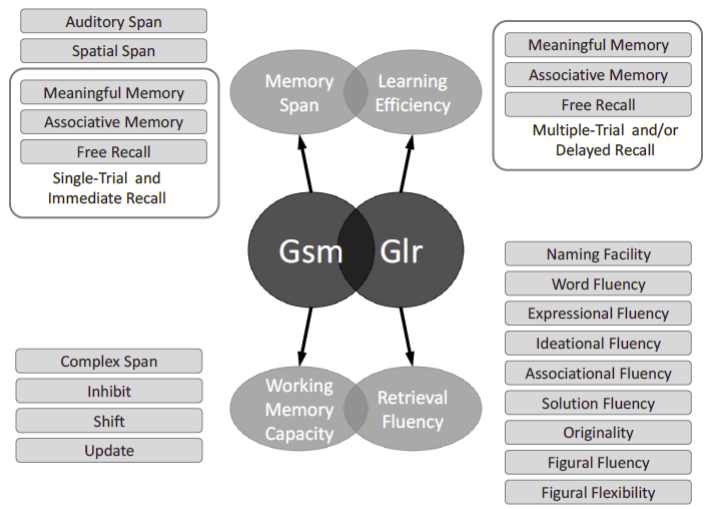
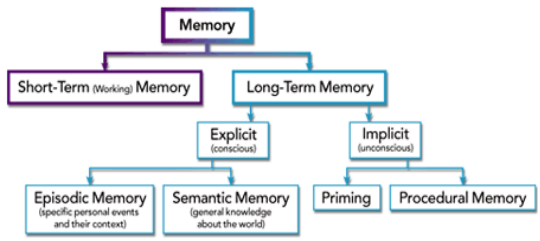
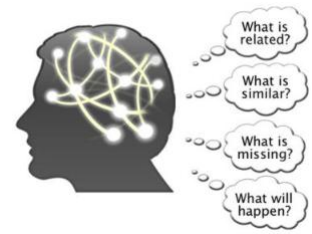


Figure 4.6. Conceptual map of memory-related abilities in CHC theory.

Relations between Glr and Reading Achievement

Glr – Naming facility (NA) or "rapid automatic naming" is very important during the elementary school years. Associative memory (MA) also appears to be important in the early elementary school years.

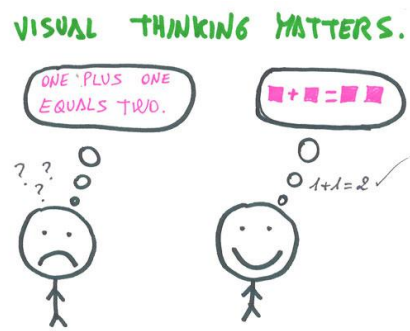




CHC Ability	Reading Achievement	Math Achievement	Writing Achievement
Glr	**Naming facility (NA) or "rapid automatic naming" is very important during the elementary school years.** Associative memory (MA) is also important.		Naming facility (NA) or "rapid automatic naming" has demonstrated relations with written expression, primarily the fluency aspect of writing.

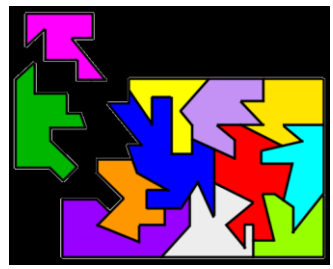
What is Visual Processing (Gv)?

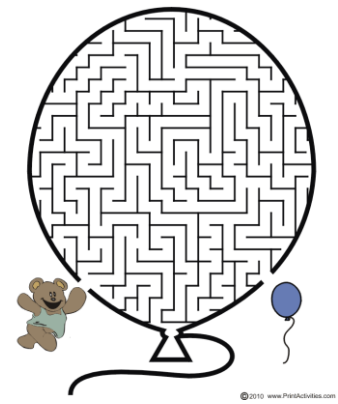
- Visual processing (Gv) is an individual's ability to think about visual patterns (e.g., what is the shortest route from your house to school?) and visual images (e.g., what would this shape look like if I turned it upside down?).



What is Visual Processing (Gv)?

- This type of ability also involves generating, perceiving, and analyzing visual patterns and visual information.
  - putting puzzles together
  - completing a maze (such as the ones often seen on children's menus in restaurants)
  - interpreting a graph or chart.
- Important when doing advanced math (e.g., geometry and calculus).





Definitions of CHC Broad and Narrow Abilities

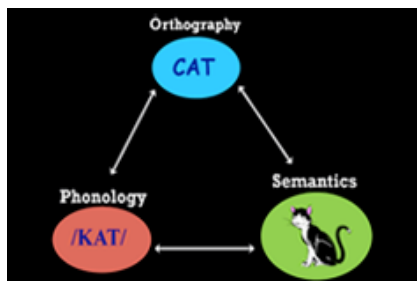
Broad Ability	Definition
Visual Processing (Gv)	The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems.
Visualization (Vz)	The ability to perceive complex patterns and mentally simulate how they might look when transformed (e.g., rotated, changed in size, partially obscured).
Speeded Rotation (SR)	The ability to solve problems quickly by using mental rotation of simple images.
Closure Speed (CS)	The ability to quickly identify a familiar meaningful visual object from incomplete (e.g., vague, partially obscured, disconnected) visual stimuli, without knowing in advance what the object is.

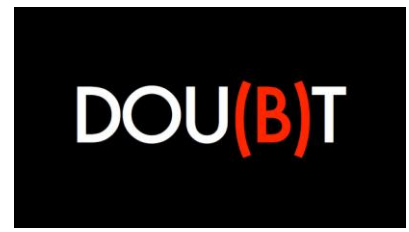
Additional Gv Narrow Abilities

Broad Ability	Definition
Visual Processing (Gv)	The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems.
Visual Memory (MV)	The ability to remember complex visual images over short periods of time (less than 30 seconds).
Spatial Scanning (SS)	The ability to visualize a path out of a maze or a field with many obstacles.

Relations between Gv Abilities and Achievement

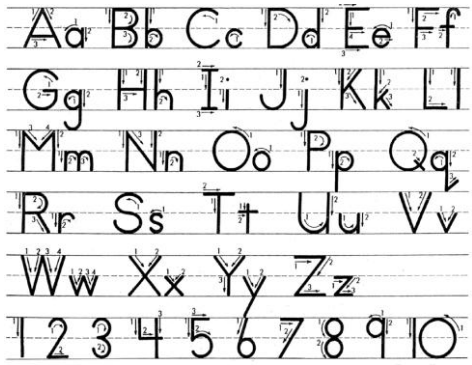
- *Gv* – Orthographic processing

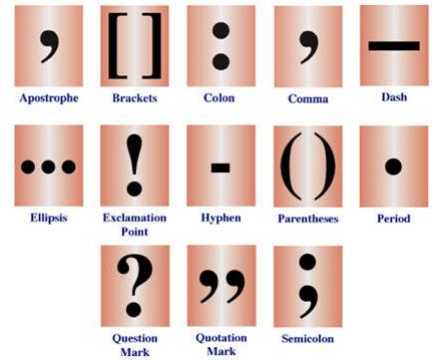




Orthography (Wagner & Barker, 1994)

- The system of marks that make up the English language, including upper and lower case letters, numbers, and punctuation marks



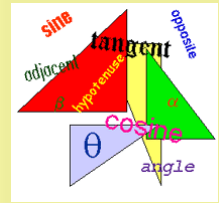


Assessing Visual Processing Related to Reading

- Visual processing must be assessed using *orthography* (letters, words and numbers) rather than abstract designs or familiar pictures

Relationship Between Gv and Achievement

CHC Ability	Reading Achievement	Math Achievement	Writing Achievement
Gv	Orthographic processing (e.g., visual processing using letters and sub-word sound units) is important for reading decoding.	Visualization (Vz) may be important primarily for higher level or advanced mathematics (e.g., geometry, calculus).	Orthographic processing (e.g., visual processing using letters and sub-word sound units) is important for spelling.



	Gv
WISC-IV	Block Design (Vz) Picture Completion (CF, Gc:K0)
WAIS-IV	Block Design (Vz) Picture Completion (CF, Gc:K0) Visual Puzzles (Vz)
WPPSI-III	Block Design (Vz) Object Assembly (CS) Picture Completion (CF, Gc:K0)
KABC-II	Face Recognition (MV) Triangles (Vz) Gestalt Closure (CS) Rover (SS, Gf:RG) Block Counting (Vz) Conceptual Thinking (Vz; Gf:I)
WJ III NU	Spatial Relations (Vz) Picture Recognition (MV) Planning (SS, Gf:RG)
SB5	Nonverbal Visual-Spatial Processing (Vz) Verbal Visual-Spatial Processing (Vz, Gc:VL, K0)
DAS-II	Pattern Construction (Vz) Recall of Designs (MV) Recognition of Pictures (MV) Copying (Vz) Matching Letter-Like Forms (Vz)

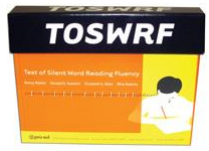
Good representation of Gv abilities; three qualitatively different indicators

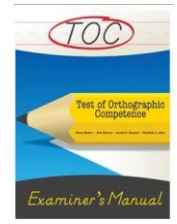
Most under-represented in area of Gv

No measures of Orthographic Processing on Intelligence and Cognitive Batteries

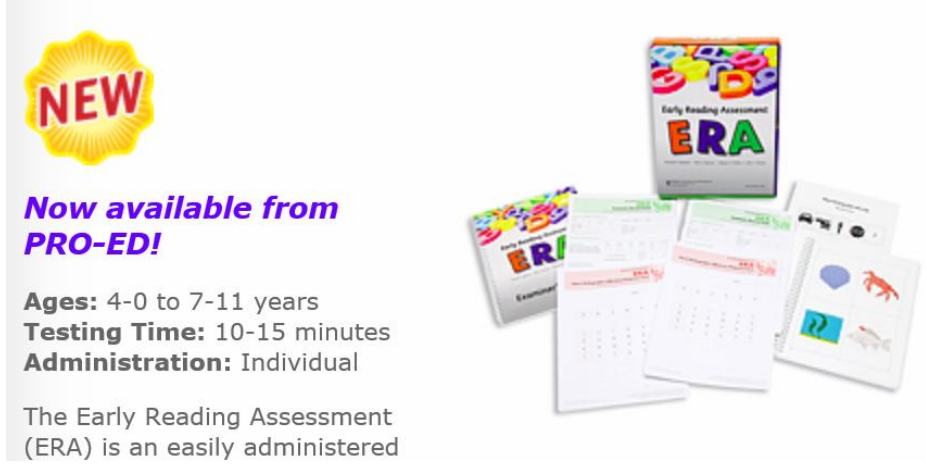
Assessing Orthographic Processing Related to Reading

- *Examples of assessments of orthographic processing directly related to reading:*
  - Test of Silent Word Reading Fluency (TOSWRF)
  - Test of Irregular Word Reading Efficiency (TIWRE)
  - Test of Orthographic Competence (TOC)
  - Process Assessment of the Learner (PAL-II)
  - Early Reading Assessment (ERA)





Latest Orthographic Processing Measure



ERA Core Subtests

- Written Word Vocabulary (WWV) —measures print knowledge. In this subtest, the child is shown a picture or letter that is accompanied by an array of five choices (words, letters, numerals, or symbols). The child is asked to point to the choice that goes with the stimulus. This subtest is not timed. Of all the subtests, this one is the most like "silent word reading comprehension."
- Rapid Orthographic Naming (RON) —measures letter-word identification and comprehension knowledge. In this subtest, the child is shown a stimulus card containing pictures, letters, numerals, and words. The child is given 60 seconds to name as many as he or she can. Of all the subtests, RON is most like "oral word reading fluency."
- Silent Orthographic Efficiency (SOE) — measures the speed with which children can match letters and words. In this subtest, the child is shown a stimulus box that contains a letter or word and is instructed to mark one of five choices that contain the same text that appears in the stimulus box. The child is given 60 seconds to respond to as many items as he or she can. This subtest is most like "silent word reading fluency."

What is Processing Speed (Gs)?

- Processing speed (Gs) refers to an individual's ability to perform simple clerical tasks quickly, especially when under pressure to maintain attention and concentration.
- It can also be thought of as how quickly one can think or how quickly one can take simple tests that require simple decisions.
- Involves sustained/focused and selective attention.

Revisions and Refinements to Gs Domain



- **Gs**: Reading Speed (RS) and Writing Speed (WS) were added (also listed under Grw)
  - Reading and writing speed demand quick, accurate performance and, therefore, are measures of Gs.

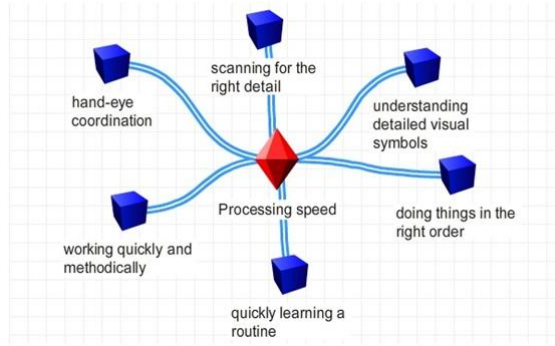
- The narrow Gs ability of Semantic Processing Speed (R4) was moved to Gt and Inspection Time (IT) was added to Gt.

Definitions of CHC Broad and Narrow Abilities

Broad Ability	Definition
Processing Speed (Gs)	The speed at which visual stimuli can be compared for similarity or difference.
Perceptual Speed (P)	The ability at which visual stimuli can be compared for similarity or difference.
Rate-of-Test-Taking (R9)	The speed and fluency with which simple cognitive tests are completed.
Number Facility (N)	The speed at which basic arithmetic operations are performed accurately.
Reading Speed (RS)	The rate of reading text with full comprehension.
Writing Speed (WS)	The rate at which words or sentences can be generated or copied.

Relations between Gs and Achievement

- ***Gs*** – Perceptual speed (P) abilities are important during all school years, particularly the elementary school years.



CHC Ability	Reading Achievement	Math Achievement	Writing Achievement
Gs	**Perceptual speed (P) is important during all school years, particularly the elementary school years.**	**Perceptual speed (P) is important during all school years, particularly the elementary school years.**	**Perceptual speed (P) is important during all school years for basic writing and written expression.**

Top Four Most Important Abilities for Learning and Academic Success

- ***Fluid Reasoning (Gf)***
- ***Crystallized Knowledge (Gc)***
  - Weaknesses in these abilities constrain learning and achievement
- **Executive Functions** – lead to inconsistencies in Learning and Achievement
- ***Short-Term Memory (Gsm)***
- ***Long-Term Storage and Retrieval (Glr)***
  - Memory, Retrieval Fluency, and Learning Efficiency
  - Weaknesses in these abilities can be improved upon, bypassed or compensated for at least to some degree
- Important Processes (related to reading)
  - ***Auditory Processing – Phonetic Coding***
  - ***Visual Processing – Orthographic Processing***
  - ***Processing Speed – Reading Fluency/Automaticity***
    - Train processing deficits to point where they become skill

See Flanagan, Ortiz, and Alfonso (2013). *Essentials of Cross-Battery Assessment*, 3e

What About Executive Functions and Achievement?

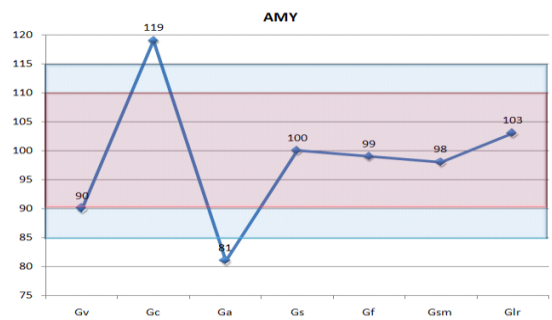
EXECUTIVE FUNCTIONING TRAIT	READING ATTRIBUTE
Planning Skills	Read with a specific question or purpose in mind when seeking specific information. Also involves the strategies the reader uses to process new information
Organization Skills	Stitch together text in a cohesive manner. Also, when distracted, the ability to return back to the text and resume the story flow
Working Memory	Temporarily suspending previously read information in mind while simultaneously linking to new information being read
Cognitive Flexibility	Shifting patterns of thought processes to the organizational parameters of the text being read, and not perseverating on material.
Verbal Fluency	Speed of processing linguistic information at the word level to facilitate passage comprehension at the text level
Concept Formation	Depth of understanding of the text

Information from Steve Feifter (in press), Tailoring Interventions for Students with Reading Difficulties, in Mascolo, Flanagan, & Alfonso (Eds.). *Essentials of Planning, Selecting, and Tailoring Interventions for the Unique Learner*. Hoboken, NJ: Wiley (Expected Publication Date: 3/2013).

Individual Differences Are Important

One Size Does Not Fit All

Different Cognitive Profiles Suggest Different Interventions



- Amy's cognitive testing shows a significant deficit in ***phonetic coding*** – she doesn't know how to translate symbols into sounds
- *Ga* deficit impacts her fluency – labored reading
- Lack of decoding and fluency impacts comprehension
- *Intervention should focus on Phonemic Awareness (phoneme-grapheme corresponence) – Remediate Ga*

Mascolo and Flanagan (2011)

Amy's Profile

- **Dysphonetic Dyslexia**
- Interventions selected should be based, in part, on the developmental level of the student
  - Intervention should include an ***explicit phonological approach***, especially with younger children (e.g., Wilson Reading System; Fundations; Fast Forword; Earobics I; Alphabetic Phonics [Uhry & Clark, 2005]). Modality based: Horizons (visual phonics approach). Lindamood (tactile cues). Secondary Level (morphological cues emphasized - Read 180)

For more information see Steve Feifter (2012), Tailoring Interventions for Students with Reading Difficulties, in Mascolo, Flanagan, & Alfonso (Eds.) (2012). *Essentials of Planning, Selecting, and Tailoring Interventions for the Unique Learner*. Hoboken, NJ: Wiley (Expected Publication Date: 3/2013).

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INTERVENTION: AUDITORY DISCRIMINATION IN DEPTH (ADD) / LINDAMOOD PHONEMIC SEQUENCING (LIPS)

April 23, 2007

Overview
Program information
Research
Effectiveness
References
Appendices
Beginning Reading
PDF: Intervention Report (757 KB)
PDF: Technical Appendices (768 KB)

Overview

The *Auditory Discrimination in Depth (ADD) Program*® (currently called the *Lindamood Phonemic Sequencing (LiPS) Program*®) is designed to teach students skills to successfully decode words and to identify individual sounds and blends in words. Initial activities engage students in discovering the lip, tongue, and mouth actions needed to produce specific sounds. After students are able to produce, label, and organize the sounds with their mouths, subsequent activities in sequencing, reading, and spelling use the oral aspects of sounds to identify and order them within words. The program also offers direct instruction in letter patterns, sight words, and context clues in reading. The *Auditory Discrimination in Depth Program*® is individualized to meet students' needs and is often used with students who have learning disabilities or difficulties. The version of the program tested here involved computer-supported activities.

Research

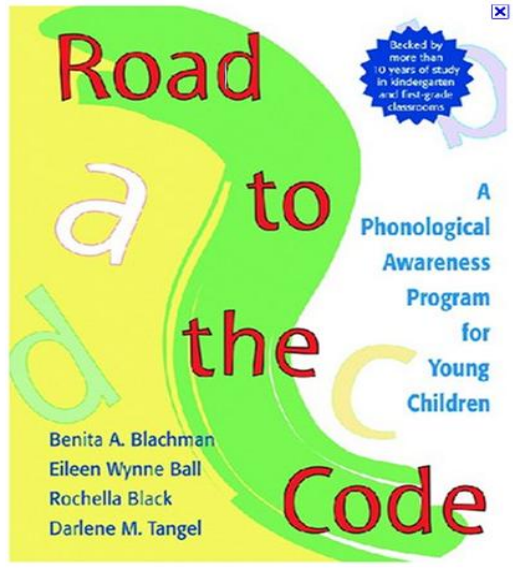
One study of *Auditory Discrimination in Depth*® met the What Works Clearinghouse (WWC) evidence standards. The study included 150 first grade students in five elementary schools. [1]

The WWC considers the extent of evidence for *Auditory Discrimination in Depth*® to be small for alphabetics and comprehension. No studies of *Auditory Discrimination in Depth*® that met WWC standards with or without reservations addressed outcomes in the domains of fluency and general reading achievement.

Another Program for Ga-Phonetic Coding Deficit

Wilson Reading®

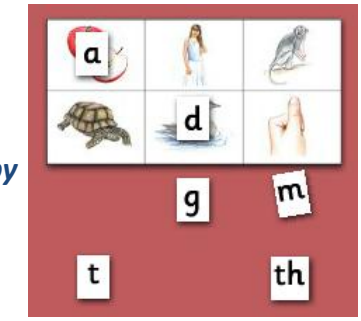
Another Program for Ga-Phonetic Coding Deficit



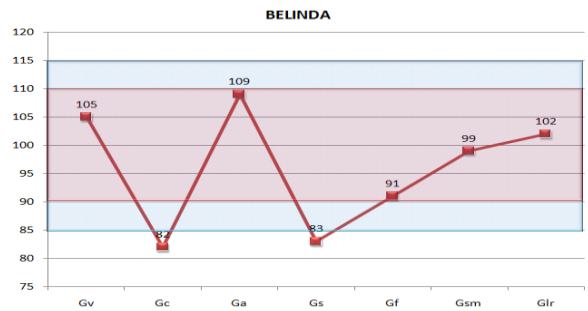
Programs/Techniques for Ga-Phonetic Coding Deficits

When selecting a program or a technique to intervene with a student with a *Ga-Phonetic Coding* deficit, consider one that

- ***Teaches students to manipulate sounds by using letters (i.e., phoneme-grapheme correspondence)***
- Uses individual or small group format
- Focuses on reading and spelling development (again, the phoneme-grapheme connection)
- Explicitly teaches student how to blend sounds



Different Cognitive Profiles Suggest Different Interventions



- *Gc* deficit – speech-language impairment?
- Comprehension is poor b/c of low *Gc*
- Poor vocabulary – needs to re-read to gain meaning
- *Gs* deficit manifests as lack of automaticity; lack of fluency; orthographic processing deficit

- *Interventions should focus on fluency and orthography building as well as vocabulary development – Build Gc-VL, KO – and building fluency; train orthographic processing deficit*

Mascolo and Flanagan (2011)

Belinda's Profile

- **Surface Dyslexia; possible Speech Language Impairment**
- Interventions selected should be based, in part, on the developmental level of the student
  - Intervention should focus on automaticity and fluency goals (not necessarily an explicit phonological approach); build sight words. Ages 7-12: Read Naturally; Over Age 12: Read 180; Wilson.

For more information see Steve Feifter (2012), Tailoring Interventions for Students with Reading Difficulties, in Mascolo, Flanagan, & Alfonso (Eds.) (2012). *Essentials of Planning, Selecting, and Tailoring Interventions for the Unique Learner*. Hoboken, NJ: Wiley (Expected Publication Date: 3/2013).

Orthographic Processing Interventions

- Fluency and Orthography Building Activities
  - Read Naturally
  - ***RAVE-O:*** **R**etrieval, **A**utomaticiy, **V**ocabulary, **E**ngagement, **O**rthography is a comprehensive fluency program developed by Maryanne Wolf at Tufts University. The goal of the program is to expand upon fluency skills, increase comprehension, and develop confidence with both oral and written language.

Orthographic Processing Interventions

- ***GREAT LEAPS READING:*** *Great Leaps Reading* is a supplementary reading program that requires just 10 minutes per day, for a minimum of three days per week. The program is divided into three major sections: (1) **Phonics** for developing basic sound awareness skills; (2) **Sight-Phrases** for mastering sight words skills; and (3) **Fluency** which uses age-appropriate stories designed to build oral reading fluency and automaticity, as well as to enhance student motivation.

Other Interventions for Belinda

Interventions and Educational Strategies that are Supplemental to Fluency and Orthography Building

Florida Center for Reading Research

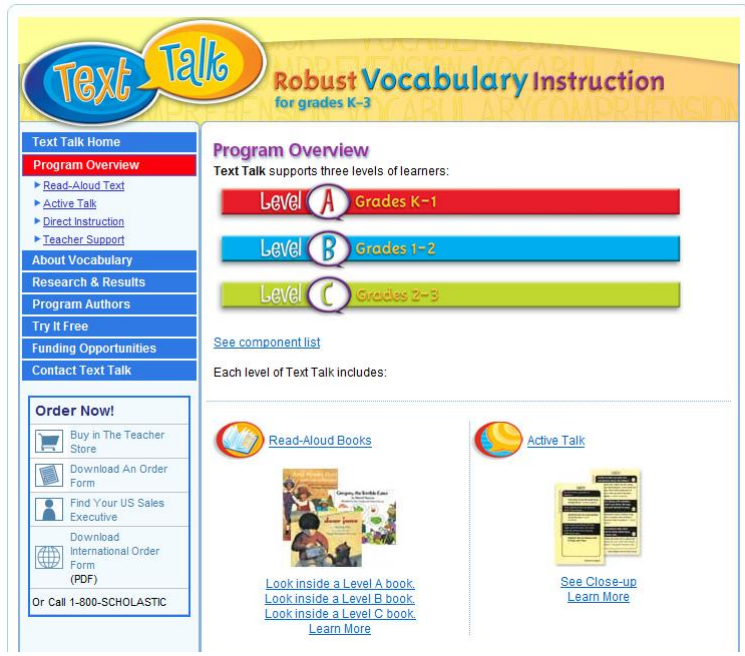
Text Talk

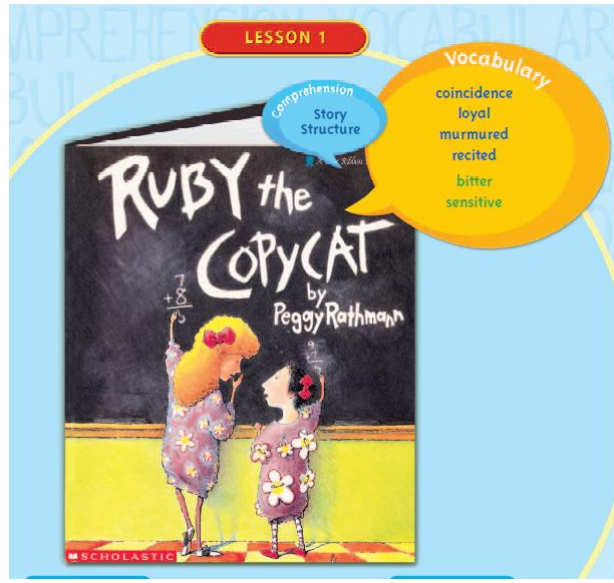
What is Text Talk?

Text Talk is an oral language instruction program intended for all students in grades K-3. It is designed to supplement a school's core reading program with 20 minutes of daily whole or small group instruction delivered by the teacher. The goal of the program is to develop the student's ability to construct meaning of sophisticated vocabulary words within the context of read-alouds and explicit vocabulary instruction. These vocabulary words and ideas are contextualized with explicit descriptions of how the words are used in the story and through interactive discussions.

The *Text Talk* instructional approach was developed by Drs. Isabel L. Beck and Margaret G. McKeown based on findings from their many years of research. These findings are depicted in their book, Bringing Words to Life which describes the rationale and methods for teaching children rich, robust vocabulary words. These words are not ordinarily found in their speaking vocabulary but would most likely be in their conceptual lexicon and appear in a variety of texts. Described as Tier 2 words in their book, Beck and McKeown underscore the importance of providing students repeated opportunities to hear and use these new vocabulary words in different contexts. The instructional strategies discussed in Bringing Words to Life are applied in the *Text Talk* program.

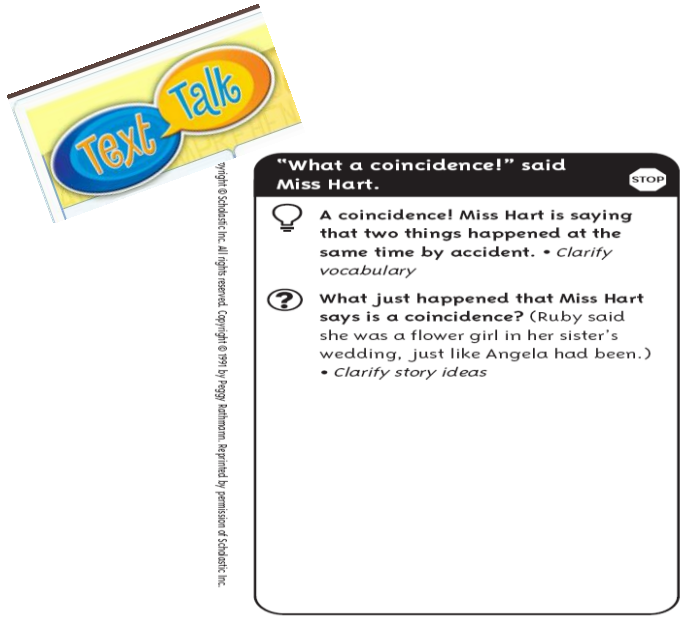
http://teacher.scholastic.com/products/texttalk/overview/readaloud.htm



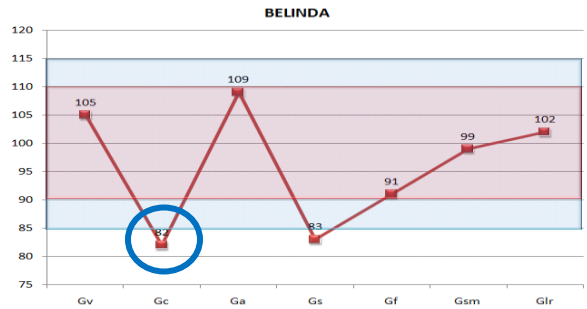


LESSON 1 Organizer

Sessions	Focus	Instruction	Standards & Objectives
Read Aloud Sessions 1 & 2	Develop Language & Comprehension	Read aloud *Ruby the Copycat*. Use the Text Talk Notes to scaffold and monitor comprehension.	• Responds to open-ended questions about the story with substantive sentences • Describes the story characters
Vocabulary Sessions 3 & 4	Introduce Vocabulary coincidence p. 7 loyal p. 17 bitter murmured p. 19 recited p. 18 sensitive Develop Vocabulary	Contextualize and explain vocabulary words and provide examples. Ask children to think about examples and to provide their own.	• Applies vocabulary words in multiple contexts
Return to the Story Session 5	Integrate Vocabulary & Comprehension Review Assess Maintain	Review and assess vocabulary words. Use them to enhance story comprehension and in shared writing. Discuss character traits in *Ruby the Copycat*.	• Uses new vocabulary words to show understanding of story characters • Demonstrates use of new and previously taught vocabulary in writing and daily conversation



Different Cognitive Profiles Suggest Different Interventions



Other Interventions for Gc Deficit

Manifestations of Cognitive Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011, 2012)

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition[1]	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Crystallized Intelligence (Gc)	•Breadth and depth of knowledge and skills that are valued by one's culture •Developed through formal education as well as general learning experiences •Stores of information and declarative and procedural knowledge •Reflects the degree to which a person has learned practically useful knowledge and matered valued skills (Schnieder & McGrew, 2012) •Narrow Gc abilities include General Verbal Information, Language Development, Lexical Knowledge, Listening Ability, Information about Culture, Communication Ability, and Grammatical Sensitivity	***Difficulties with:*** •Vocabulary acquisition •Knowledge acquisition •Comprehending language or understanding what others are saying •Fact-based/informational questions •Using prior knowledge to support learning •Finding the right words to use/say	***Reading Difficulties:*** •Decoding (e.g., word student is attempting to decode is not in his/her vocabulary) •Comprending (e.g., poor background knowledge about information contained in text) ***Math Difficulties:*** •Understanding math concepts and the "vocabulary of math" ***Writing Difficulties:*** •Grammar (syntax) •Bland writing with limited descriptors •Verbose writing with limited descriptors •Inappropriate word usage ***Language Difficulties:*** •Understanding class lessons •Expressive language – "poverty of thought"	•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 •Teach morphology •Use text talks •Include supportive modalities (e.g., visuals, gestures) to increase understanding of language used •Embed instruction within a meaningful context (e.g., relating words to learner experiences, increasing listening ability through game-like format) •Use Vocabulary Cartoons (Burchers, 2000)

Flanagan, D. P., Alfonso, V. C., Sotelo-Dynega, M., & Mascolo, J. T. (2012). Use of Ability Tests in the Identification of Specific Learning Disabilities (SLD) within the context of an Operational Definition. In D.P. Flanagan & P.L. Harrison, ***Contemporary intellectual assessment: Theories, tests, and issues (3rd edition)***. New York: Guilford.

Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), ***Essentials of Specific Learning Disability Identification***. New York, NY: John Wiley & Sons.

Gc Recommendations

- Provide an environment rich in language and experiences
- Frequent practice with and exposure to words
- Read aloud to children
- Vary reading purpose (leisure, information)

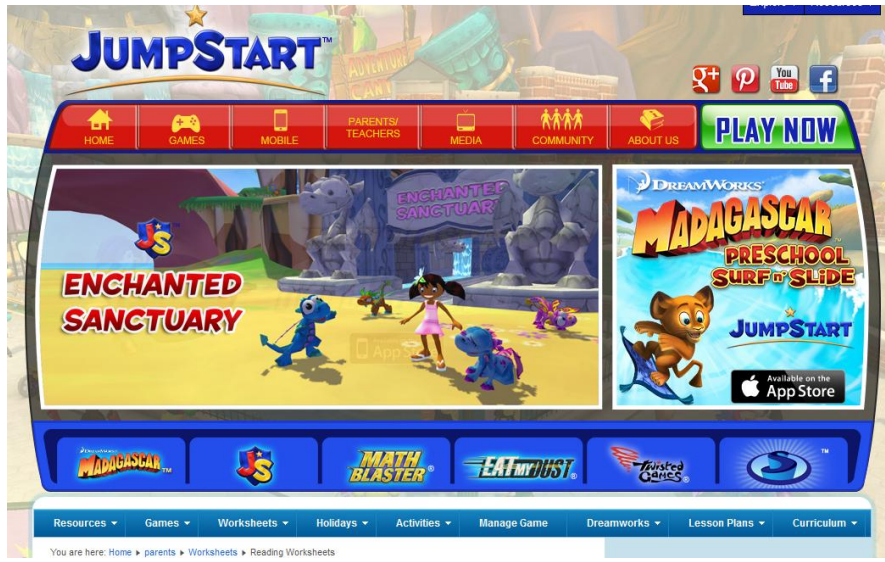
Recommendations for Gc (Verbal Ability) Deficit

- Work on vocabulary building
- Teach morphology
- Activities to build listening skills
- Explicitly teach listening strategies

Programs/Techniques for Gc (Verbal Ability) Deficits

- When selecting a program or a technique to intervene with a student with a Gc deficit, it may be helpful to consider one that
  - includes some sort of **vocabulary building**
  - includes **supportive modalities** to increase understanding of language used (e.g., visuals, gestures)
  - **embeds instruction within a meaningful context** (e.g., relating words to learner experiences, communicating word meanings with visuals, increasing listening ability through game-like format)

http://www.jumpstart.com/parents/worksheets/reading-worksheets



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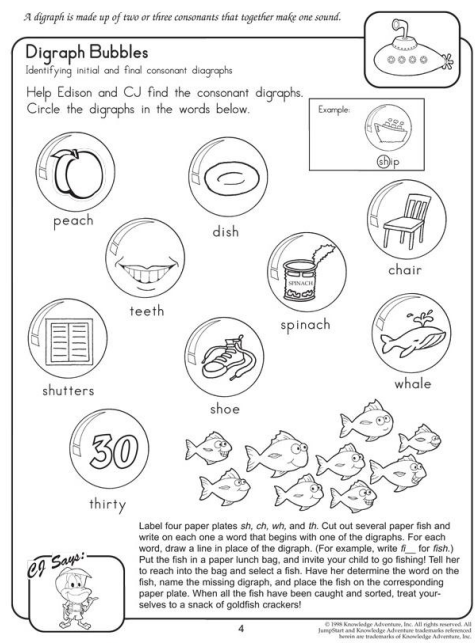

A digraph is made up of two or three consonants that together make one sound.

Digraph Bubbles

Identifying initial and final consonant diagraphs

Help Edison and CJ find the consonant digraphs. Circle the digraphs in the words below.

Example: ship

peach, dish, chair, teeth, spinach, shutters, shoe, whale, 30 thirty

CJ Says:

Label four paper plates *sh, ch, wh,* and *th*. Cut out several paper fish and write on each one a word that begins with one of the digraphs. For each word, draw a line in place of the digraph. (For example, write *fi__* for *fish*.) Put the fish in a paper lunch bag, and invite your child to go fishing! Tell her to reach into the bag and select a fish. Have her determine the word on the fish, name the missing digraph, and place the fish on the corresponding paper plate. When all the fish have been caught and sorted, treat yourselves to a snack of goldfish crackers!

4

DOWNLOAD PDF

http://www.jumpstart.com/parents/worksheets/reading-worksheets

http://www.vocabulary.co.il/english-language-games/

Vocabulary Can Be Fun!

One Thousand Free English Vocabulary Building Games

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Analogy Games, Antonym Games, Compound Word Games, Context Games, Contraction Games, English Language Games, Foreign Language Games, Hig Pig Games, Homophone Games, Idioms Games, Latin Learning Games, Literature Games, Oxymoron Games, Parts of Speech Games, Phonics Games, Prefix Games, Root Word Games, SAT Games, Spelling Games, Suffix Games, Syllable Games, Synonym Games, Typing Games, Word Play Games

BRAIN TRAINING GAMES

Intelligence, Memory, Attention, Focus, Speed, Language

Learning English Language

Learning English can feel overwhelming to anyone. Children start out learning English at a very young age by first imitating adults and later in school. Starting to build a continued...

New Featured ESL Game

Audio Word Match!

With Audio Word Match you can "Hear" and"See" the words in this fun memory style game! To start having fun and learning, just pick a game below and start playing!

English Language Games

English Word Recognition Game
Elementary: Find the Synonym
Basal Reader Word Synonym Match
Elementary Suffix Meaning
Idioms Game Slang Game
Animal Slang Game
Matilda Syllable Game
3rd-5th Grade Word Builder
Color Memory Match
Numbers to Ten Memory Match

Sight Words Games

Primary Sight Words I
Primary Sight Words II

Stay 2 nights and get a $50 Resort Credit

Plus $25 Extra Credit for each additional night.*

LEARN MORE

*See website for details.

Having fun? Learning? Tell your friends!

Activate Search

Primary Games

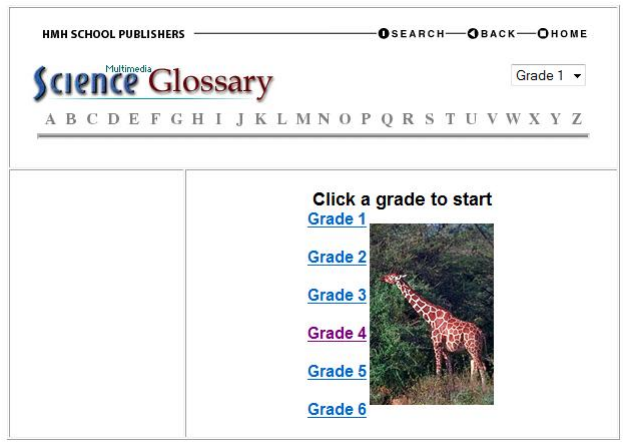
Kindergarten Vocabulary Practice Games
First Grade Vocabulary Practice Games
Second Grade Vocabulary Practice Games

Intermediate Games

Third Grade Vocabulary Learning Games
Fourth Grade Vocabulary Learning Games
Fifth Grade Vocabulary Learning Games

Middle School Games

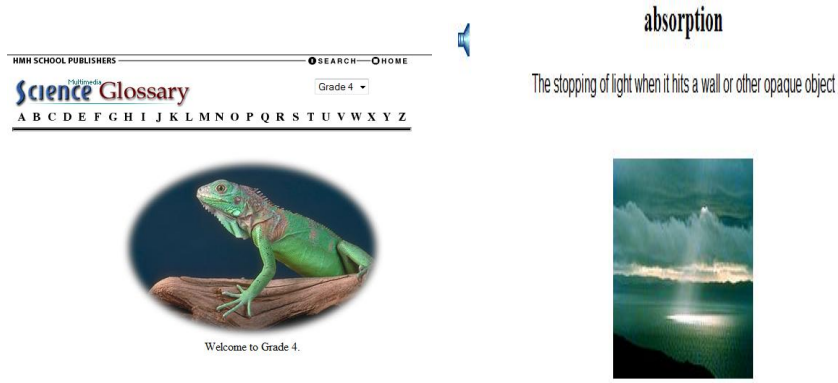
Using Instructional Materials - helps with lexical knowledge (Vocabulary; Gc) deficit



http://www.harcourtschool.com/glossary/science/

Vocabulary with Sound

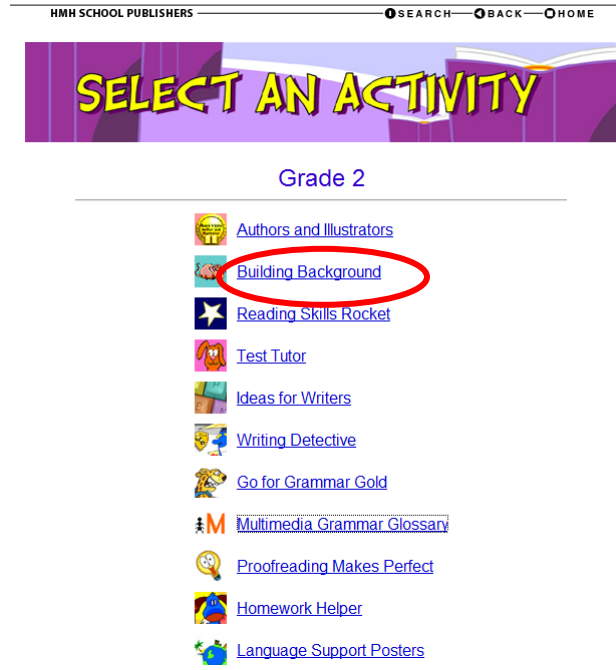
http://www.harcourtschool.com/glossary/science/



Has the added audio if child needs it

Limited Background Knowledge? Build it!

(Harcourt online activities)



The Mixed-Up Chameleon

What is a Chameleon?
A chameleon is a kind of lizard that can change color. A chameleon can turn brown, green, blue, yellow, red, black, or white. The colors help the chameleon let other chameleons know how it is feeling. If the chameleon is happy, it may turn green. If the chameleon is mad, it may turn yellow. A chameleon also changes color because of how hot or cold it is, or how light or dark it is.

Belinda has a Processing Speed (Gs)/Automaticity Deficit – Suggest Need to Work on Building Fluency

- Choral Repeated Reading
  - Students listen to the text being read and follow along by reading aloud and looking at the text (using their fingers to keep pace)
  - 10 to 15 minutes
  - Text can be higher than students' instructional level
  - Comprehension activities can be added
  - Feedback and assistance can be provided

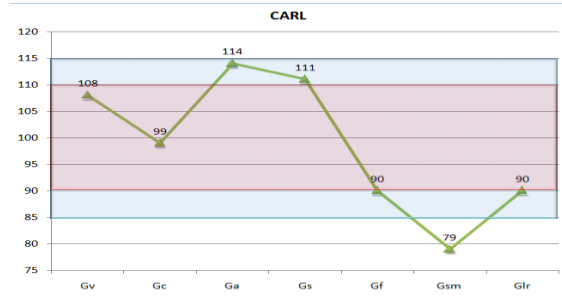
WWC: Reading Fluency interventions

- Peer-Assisted Learning Strategies (PALS)
  - Teachers train students
  - Students partner with peers, alternating the role of tutor while reading aloud, listening, and providing feedback in various structural activities

WWC: Reading Fluency interventions

- Fluency Formula™
  - Grades 1-6
  - Emphasizes automatic recognition of words, decoding accuracy, and oral expression
  - 10-15 minutes daily; small groups
  - Uses workbooks, read-aloud anthologies, fluency activity cards and audio CDs

Different Cognitive Profiles Suggest Different Interventions



- *Gsm* deficit – memory span and working memory are deficient; visual memory ok
- Decoding is poor – he cannot hold the complete phonemic string in mind long enough to say the word
- Comprehension is poor because he needs to allocate all memory space decoding words and therefore cannot focus on meaning
- Fluency is impaired because he must re-read the text to gain meaning
- *Intervention should focus on developing a sight word vocabulary*
- Carl needs to be taught *compensatory strategies* to assist with poor *Gsm (text previews; guided notes; one comprehension question at a time)*

Mascolo and Flanagan (2011)

Carl

- SLD in Reading – underlying Working Memory deficit

Build Sight Words

Go to: http://www.mrsperkins.com/dolch.htm

Print Flash Cards

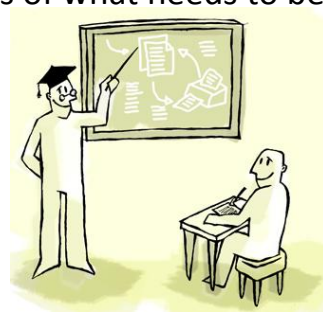
Use folding-in technique (builds confidence)

Pre-primer	Primer	First
a	all	after
and	am	again
away	are	an
big	at	any
blue	ate	as
can	be	ask
come	black	by
down	brown	could
find	but	every
for	came	fly
funny	did	from
go	do	give
help	eat	going
here	four	had
I	get	has
in	good	her
is	have	him
it	he	his
jump	into	how
little	like	just
look	must	know
make	new	let
me	no	live
my	now	may
not	on	of
one	our	old
play	out	once

Build Sight Words: Good Visual Ability (Gv); Difficulty with Memory (Gsm)

Carl needs strategies for Gsm deficits
(memory span; working memory)

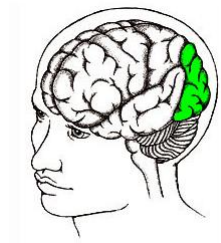
- **Give Directions in Multiple Formats:**
  - visual and verbal
  - encourage him to paraphrase directions and explain what they mean
  - give examples of what needs to be done



Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

Carl needs strategies for Gsm deficits (memory span; working memory)

- **Teach Students to Over-learn Material**
  - several error-free repetitions are needed to solidify the information
- **Teach Students to Use Visual Images and Other Memory Strategies**



Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

Visual Images Used to Aid Vocabulary Development

- Reading
  - Vocabulary Cartoons II (Burchers, 2000)
    - Target word and definition are included along with a cartoon that reinforces the words meaning in a visual format
    - Grades 3+

COLOSSAL
(kuh LOS ul) *adj.*
enormous, gigantic; huge in size, extent or degree

Sounds like: **FOSSIL**

"A COLOSSAL FOSSIL."

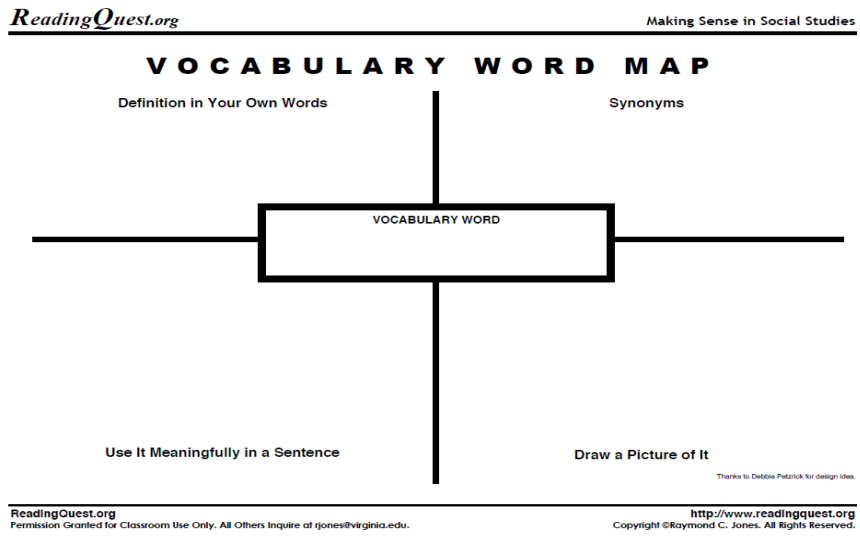
ABDUCT
(ab DUCT)
to kidnap or carry off by force

Sounds like: **DUCK**

"ABDUCTED DUCKS."

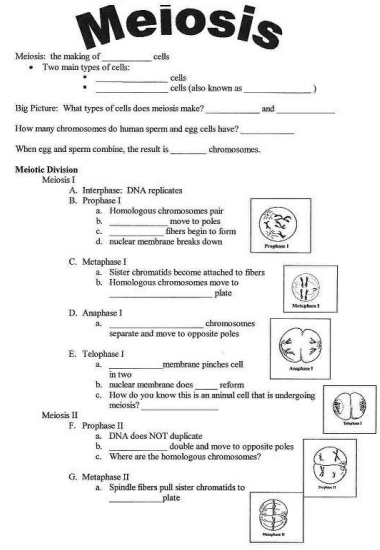
- The Evil Knight planned to **ABDUCT** the queen when she came alone to the village.

Sight Word Development Aided by Visual Images and Multiple Associations



Strategies for Gsm deficits (memory span; working memory)

- **Give Teacher-Prepared Handouts Prior to Class Lectures:**
  - brief outline
  - guided notes
  - partially completed graphic organizer that the student would complete during the lecture


Meiosis

Meiosis: the making of _____ cells
- Two main types of cells:
  - _____ cells
  - _____ cells (also known as _____)

Big Picture: What types of cells does meiosis make? _____ and _____

How many chromosomes do human sperm and egg cells have? _____

When egg and sperm combine, the result is _____ chromosomes.

Meiotic Division

Meiosis I

A. Interphase: DNA replicates

B. Prophase I
   a. Homologous chromosomes pair
   b. _____ move to poles
   c. _____ fibers begin to form
   d. nuclear membrane breaks down

C. Metaphase I
   a. Sister chromatids become attached to fibers
   b. Homologous chromosomes move to _____ plate

D. Anaphase I
   a. _____ chromosomes separate and move to opposite poles

E. Telophase I
   a. _____ membrane pinches cell in two
   b. nuclear membrane does _____ reform
   c. How do you know this is an animal cell that is undergoing meiosis? _____

Meiosis II

F. Prophase II
   a. DNA does NOT duplicate
   b. _____ double and move to opposite poles
   c. Where are the homologous chromosomes?

G. Metaphase II
   a. Spindle fibers pull sister chromatids to _____ plate

Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

Strategies for Gsm deficits (memory span; working memory)

- **Teach Students to Be Active Readers:**
  - students should underline, highlight, or jot key words down in the margins
  - To consolidate this information in long-term memory, they can make outlines or use graphic organizers

Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

Strategies for Gsm deficits (memory span; working memory)

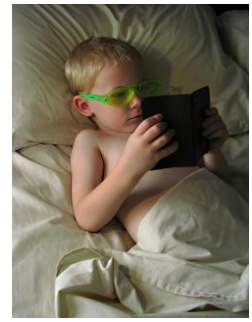
- **Help Students Develop Cues When Storing Information:**
  - HOMES can be used to represent the names of the Great Lakes – Huron, Ontario, Michigan, Erie and Superior

- **Prime the Memory Prior to Teaching/Learning:**
  - discuss 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.

Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

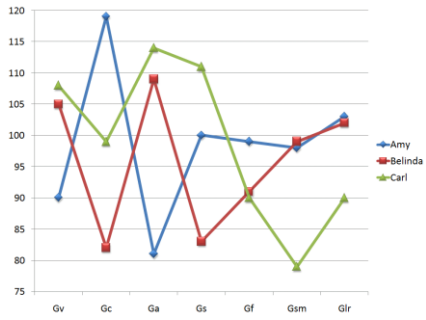
Strategies for Gsm deficits

- **Review Material Before Going to Sleep:**
  - information studied this way is better remembered
  - any other task that is performed after reviewing and prior to sleeping (such as getting a snack, brushing teeth, listening to music) interferes with consolidation of information in memory



Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

Different Cognitive Ability Profiles Suggest Different Interventions

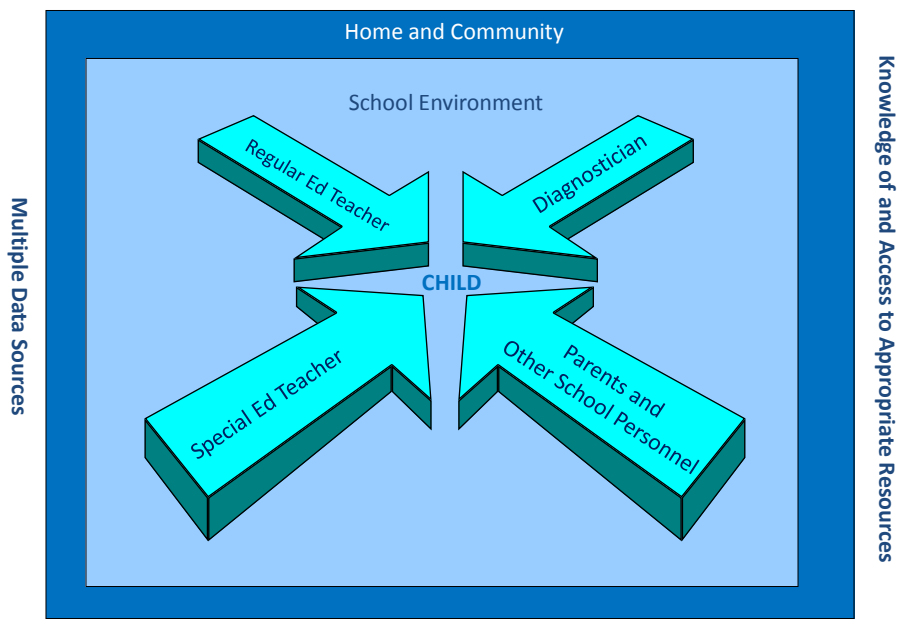


- **All had same academic deficits (decoding, comprehension, fluency)**
- ***All made slow gains with Reading Recovery***
- **All had different patterns of cognitive strengths and weaknesses**
- **Reading Recovery – allocating time to areas that do not need to be trained**
- **Not enough explicit instruction in main problem area *because the intervention was not tailored***

Mascolo and Flanagan (2010)

Assessment for Intervention

Instructional Planning is Complex and Requires a Team of Experts



Mascolo and Flanagan (2011)

Linking Assessment to Intervention

- Requires good instruments
- Well trained clinicians
- Well trained teachers and special educators
- *A mechanism in place for bringing data together to problem-solve in an attempt to offer the most effective instruction and interventions to children*

Mascolo and Flanagan (2011)

MARC Interventions (Mascolo, Flanagan, & Alfonso, in press)

Intervention Term	Definition	Examples
Modification	Changes content of material to be taught or measured; Typically involves changing or reducing learning or measurement expectations; Modifications can change the depth, breadth, and complexity of learning and measurement goals	• Reducing the amount of material that a student is required to learn • Simplify complexity of material to be learned, such as teaching mixed fractions with like denominators versus using unlike denominators that are taught to peers • Requiring only literal (as opposed to critical/inferential) questions from an end of chapter comprehension check • Simplifying test instructions and content
Accommodation (leveling the playing field; fairness) Don't know the extent to which accommodations alter the construct being measured	Changes conditions under which learning occurs or is measured. Does not change or reduce learning or assessment expectations. A general rule of thumb for identifying accommodations is that the learning or measurement product looks identical to that of a student without accommodations. Accommodations may include timing, flexible scheduling, presentation (e.g., enlarged text), setting (e.g., a separate room to work), response accommodations (e.g., circling answers in test booklet instead of using a scantron).	• Extending time on exams • Assigning a project in advance or allowing more time to complete the a project • Aligning math problems vertically, as opposed to horizontally • Having a student dictate responses to a scribe
Remediation	Techniques or programs used to ameliorate cognitive and academic deficits. Academic interventions typically focus on developing a skill, increasing automaticity of skills, or improving the application of skills. Cognitive interventions typically focus on improving cognitive processes such as working memory capacity and phonological processing. There are many techniques, published programs, and software designed for the purpose of remediation.	• Evidence-based programs listed at What Works Clearing House: http://ies.ed.gov/ncee/wwc • Reading programs appearing on the Florida Center for Reading Research website: www.fcrr.ord • Techniques and materials from the Reading Rockets website: www.readingrockets.org • CogMed (Pearson) • Spotlight on Listening Comprehension (LinguiSystems, 2006)
Compensation	Aimed at providing the learner with procedures, techniques, and strategies that are intended to bypass or minimize the impact of a cognitive or academic deficit.	• Teaching the use of mnemonic devices • Organizational aids or techniques • Teaching a student to outline or use graphic organizers

Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011, 2012)

Definitions of CHC Cognitive Abilities and Neuropsychological Functions, Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Based on Flanagan, Alfonso, & Mascolo, 2012; *Contemporary Intellectual Assessment*, 3rd edition)

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition[1]	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Fluid Reasoning (Gf)	•Novel reasoning and problem solving; ability to solve problems that are unfamiliar •Processes are minimally dependent on prior learning •Involves manipulating rules, abstracting, generalizing, and identifying logical relationships •Fluid reasoning is evident in inferential reasoning, concept formation, classification of unfamiliar stimuli, categorization, and extrapolation of reasonable estimates in ambiguous situations (Shneider & McGrew, 2012) •Narrow Gf abilities include Induction, General Sequential Reasoning (Deduction), and Quantitative Reasoning	***Difficulties with***: • Higher level thinking and reasoning •Transferring or generalizing learning •Deriving solutions for novel problems •Extending knowledge through critical thinking •Perceiving and applying underlying rules or process(es) to solve problems	***Reading Difficulties:*** •Drawing inferences from text •Abstracting main idea(s) ***Math Difficulties:*** •Reasoning with quantitative information (word problems) •Internalizing procedures and processes used to solve problems •Apprehending relationships between numbers ***Writing Difficulties:*** •Essay writing and generalizing concepts •Developing a theme •Comparing and contrasting ideas	•Develop student's skill in categorizing objects and drawing conclusions •Use demonstrations to externalize the reasoning process •Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or process(es) •Targeted feedback •Cooperative learning •Reciprocal teaching •Use graphic organizers to arrange information in visual format •Teach metacognitive strategies (mnemonics that are *memorable* and that *accurately represent* the learning task) •Comparison of new concepts to previously learned concepts (same vs. different) •Use analogies, similes, metaphors when presenting tasks

Flanagan, D. P., Alfonso, V. C., Sotelo-Dynega, M., & Mascolo, J. T. (2012). Use of Ability Tests in the Identification of Specific Learning Disabilities (SLD) within the context of an Operational Definition. In D.P. Flanagan & P.L. Harrison, ***Contemporary intellectual assessment: Theories, tests, and issues (3rd edition)***. New York: Guilford.

Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), ***Essentials of Specific Learning Disability Identification***. New York, NY: John Wiley & Sons.

General Manifestation of Deficit in Fluid Reasoning (*Gf*)

- Difficulties with deductive reasoning (general to specific)
- Difficulties with inductive reasoning (specific to general)
- Transferring or generalizing learning
- Deriving solutions for novel problems
- Extending knowledge through critical thinking
- Perceiving and applying underlying rules or processes to solve problems

Academic Manifestations of Fluid Reasoning *(Gf)* Deficit

- ***Reading***
  - Difficulties with inferential reading comprehension
  - Difficulty abstracting main idea

Recommendations for Fluid Reasoning Gf Deficit

- Develop student's skill in categorizing objects and drawing conclusions
- Use demonstrations to externalize the reasoning process
  - Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or processes

Recommendations for Fluid Reasoning Gf Deficit

- Targeted feedback
- Cooperative learning
- Think Alouds
- Reciprocal teaching
- Graphic organizers to arrange information in visual format

Targeted Feedback

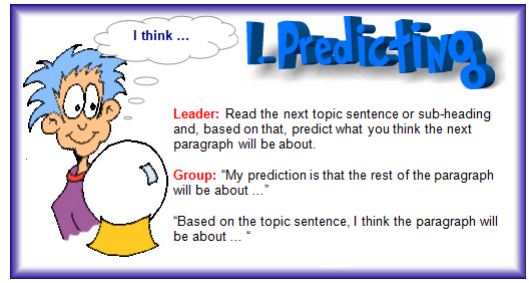
- Feedback to students is important and needs to be *concrete* and *specific*
  - Highlight parts of the task that they executed appropriately
  - Identify where things went "wrong" or off-course
  - Describe how to correct the mistakes
  - Provide opportunity for self-correction and/or practice

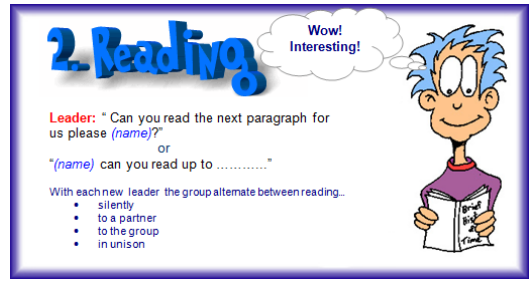
Cooperative Learning

- Can be in pairs or small group
- Students with *Gf* deficits can be matched with students who have good reasoning skills and who are comfortable with "thinking aloud" and contributing to the group
- Important to assign tasks that capitalize upon student's strengths and assist in accomplishing your goal (e.g., student who needs help with reasoning may read well)
- Feedback/Processing of experience is important

Reciprocal Teaching Cards

www.adrianbruce.com/reading/room4/recip





Reciprocal Teaching Cards

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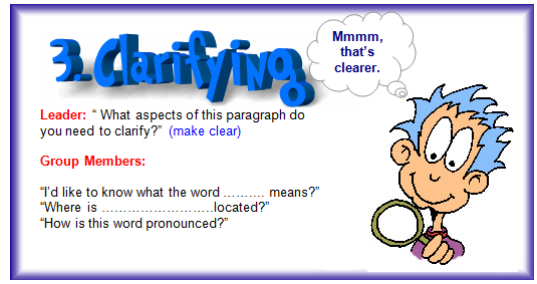

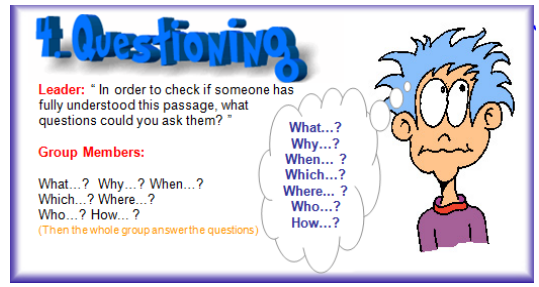

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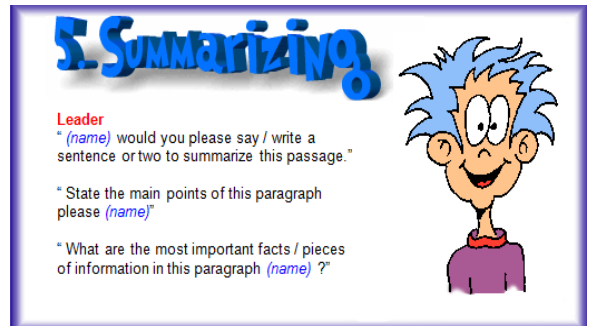
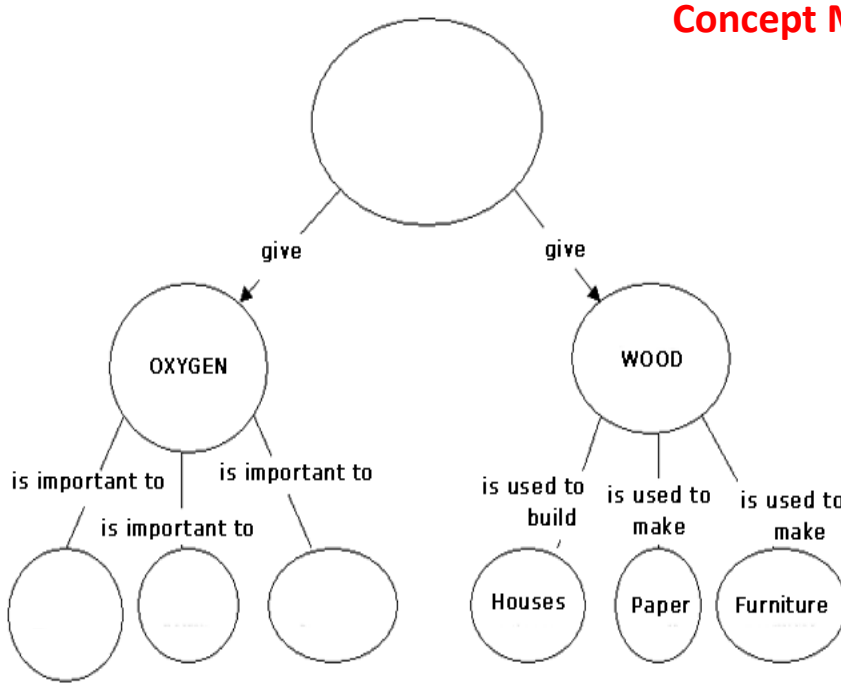


Graphic Organizers

- Make use of graphic organizers (Venn diagrams, concept maps) to help the student
  - Understand the information conceptually through a visual modality
  - More readily link new information to known information
  - Make links from specific to general

Concept Map



Programs/Techniques for *Gf* Deficits

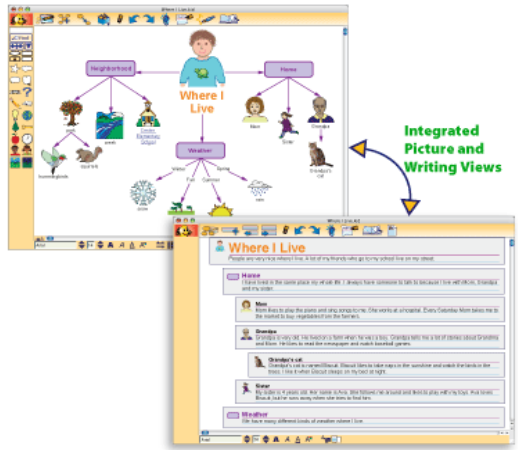
- When selecting a program or a technique to intervene with a student with a *Gf* deficit, it may be helpful to consider one that
  - includes ***explicit strategy instruction***
  - focuses on the application of higher level thinking skills to the reading process (e.g., making predictions, drawing inferences, abstracting, inferring character feelings)
  - is multi-staged and includes modeling up through independent application of the strategy/technique

Reading and Writing Examples (Gf)

- Inspiration/Kidspiration software (www.inspiration.com)
  - "Created for K-5 learners, Kidspiration® develops thinking, literacy and numeracy skills using proven visual learning principles. In reading and writing, Kidspiration strengthens word recognition, vocabulary, comprehension and written expression. With new visual math tools, students build reasoning and problem solving skills."

Kidspiration provides a cross-curricular visual workspace for K-5 learners. Students use visual tools combining pictures, text, numbers and spoken words to develop vocabulary, word recognition, comprehension, reasoning and problem solving skills.

Kidspiration works the way students think and learn and the way teachers teach. As students make visual connections, they build fundamental skills in reading, writing, math, science and social studies. Kidspiration offers activities in all curriculum areas, so students use visual learning naturally and confidently.



Manifestations of Cognitive Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011)

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition[1]	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Auditory Processing (Ga)	•Ability to analyze and synthesize auditory information •One narrow aspect of Ga is a precursor to oral language comprehension (i.e., parsing speech sounds or Phonetic Coding) •In addition to Phonetic Coding, other narrow Ga abilities include, Speech Sound Discrimination, Resistance to Auditory Stimulus Distortion, Memory for Sound Patterns, (and others related to music)	***Difficulties with:*** •Hearing information presented orally, initially processing oral information •Paying attention especially in the presence of background noise •Discerning the direction from which auditory information is coming •Discriminating between simple sounds •Foreign language acquisition	***Reading Difficulties:*** •Acquiring phonics skills •Sounding out words •Using phonetic strategies ***Math Difficulties:*** •Reading word problems ***Writing Difficulties:*** •Spelling •Note taking •Poor quality of writing	•Phonemic awareness activities •Emphasis on sight-word reading •Teach comprehension monitoring (e.g., does the word I heard/read make sense in context?) •Annunciating sounds in words in an emphatic manner when teaching new words for reading or spelling •Use work preview/text preview to clarify unknown words •Provide guided notes during note taking activities •Build in time for clarification questions related to "missed" or "misheard" items during lecture •Supplement oral instructions with written instructions •Shortening instructions •Preferential seating •Localizing sound source for student •Minimizing background noise

Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), *Essentials of Specific Learning Disability Identification*. New York, NY: John Wiley & Sons.

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CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition[1]	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Long-Term Retrieval (Glr)	•Ability to store information (e.g., concepts, words, facts), consolidate it, and fluently retrieve it at a later time (e.g., minutes, hours, days, and years)through association •In Glr tasks, information leaves immediate awareness long enough for the contents of primary memory to be displaced completely. In other words, Glr tasks (unlike Gsm tasks) do not allow for information to be maintained continuously in primary memory (Schneider & McGrew, 2012) •Glr abilities may be categorized as either "learning efficiency" or "fluency". Learning efficiency narrow abilities include Associative Memory, Meaningful Memory, and Free Recall Memory; fluency narrow abilities involve either the production of ideas (e.g., Ideational Fluency, Associational Fluency), the recall of words (e.g., Naming Facility, Word Fluency), or the generation of figures (e.g., Figural Fluency, Figural Flexibility) (Schneider & McGrew, 2012)	***Difficulties with:*** •Learning new concepts •Retrieving or recalling information by using association •Performing consistently across different task formats (e.g., recognition versus recall formats) •Rapid retrieval of information •Learning information quickly •Paired learning (visual-auditory) •Recalling specific information (words, facts) •Generating ideas rapidly	***Reading Difficulties:*** •Accessing background knowledge to support new learning while reading •Slow to access phonological representations during decoding •Retelling or paraphrasing what one has read ***Math Difficulties:*** • Memorizing math facts •Recalling math facts and procedures ***Writing Difficulties:*** •Accessing words to use during essay writing •Specific writing tasks (compare and contrast; persuasive writing) •Note-taking •Idea generation/production ***Language Difficulties:*** •Expressive – circumlocutions, speech fillers, "interrupted" thought, pauses •Receptive – making connections throughout oral presentations (e.g., class lecture)	•Repeated practice with and review of newly presented information •Teach memory strategies (verbal rehearsal to support encoding, use of mnemonic devices) •Use multiple modalities when teaching new concepts (pair written with verbal information) •Limit the amount of new material to be learned; introduce new concepts gradually and with a lot of context •Be mindful of when new concepts are presented •Make associations between newly learned and prior information explicit •Use lists to facilitate recall (prompts) •Expand vocabulary to minimize impact of word retrieval deficits •Build in wait-time for student when fluency of retrieval is an issue •Use text previews to "prime" knowledge •Provide background knowledge first before asking a question to "prime" student for retrieval

Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), *Essentials of Specific Learning Disability Identification*. New York, NY: John Wiley & Sons.

Academic Manifestations (Glr)

- Language
  - Expressive – circumlocutions, speech fillers, "interrupted" thought, pauses
  - Receptive – making connections throughout oral presentations (e.g., class lecture)

Interventions for *Glr*

- **Active learning** *(Marzano, et al., 2001)*
- **Rehearsal, overlearning, elaboration** *(Squire & Schacter, 2003)*
- **Mnemonics** *(Wolfe, 2001)*
- **Visual representation** *(Greenleaf & Wells-Papanek, 2005)*
- **Organizational strategies**

Wendling and Miller (2010)

Glr Recommendations

- Repeated practice with and review of newly presented information
- Teach memory strategies (verbal rehearsal to support encoding, use of mnemonic devices)
- Use multiple modalities when teaching new concepts (pair written with verbal information)
- Limit the amount of new material to be learned; introduce new concepts gradually and with a lot of context
- Make associations between newly learned and prior information explicit
- Use lists to facilitate recall (prompts)

Glr Recommendations

- Expand vocabulary to minimize impact of word retrieval deficits
- Build in wait-time for student when fluency of retrieval is an issue
- Provide background knowledge first before asking a question to "prime" student for retrieval

Programs/Techniques for Glr Deficits

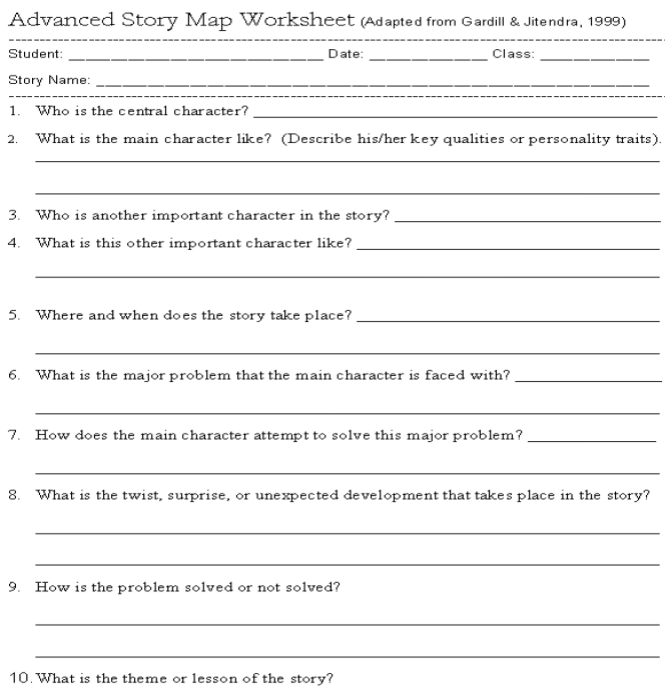
- When selecting a program or a technique to intervene with a student with a Glr deficit, it is helpful to ensure that it
  - includes encoding strategies (e.g., mnemonics, visuals)
  - uses some form of strategy instruction for accessing information

Reading and Writing Intervention Examples (Glr)

- Reading
  - Teaching text structure which, "organizes the reader's thinking, and enhances understanding and recall of the information" (Wendling & Mather, 2009, p. 108)

Reading and Writing Examples (Glr)

- Story Map
  - Type of graphic organizer that can be used to teach narrative text structure
  - Focuses on 4 elements including (1) characters and their personalities/ motivations; (2) main problem; (3) characters' attempts to problem solve; (4) outcome/conclusion



Advanced Story Map Worksheet (Adapted from Gardill & Jitendra, 1999)

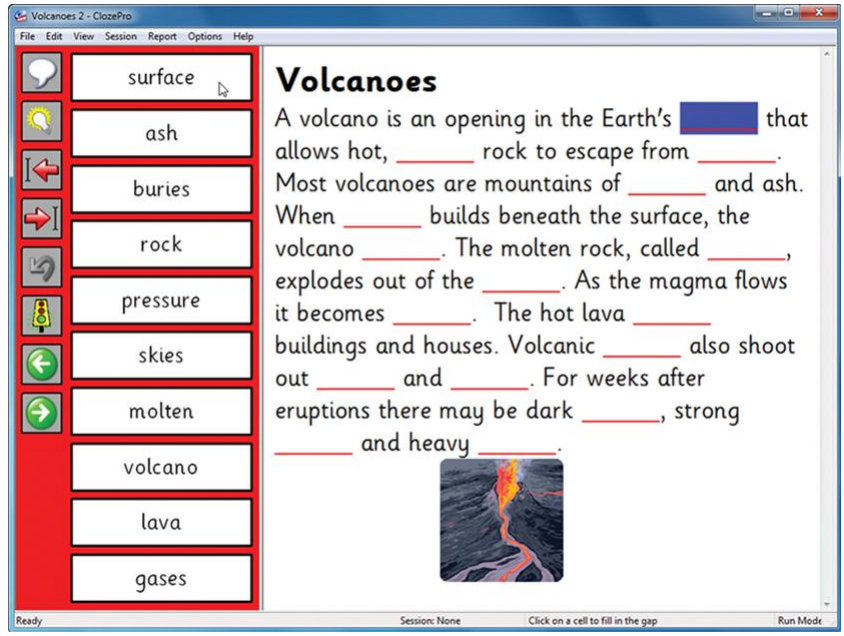
Student: _____ Date: _____ Class: _____

Story Name: _____

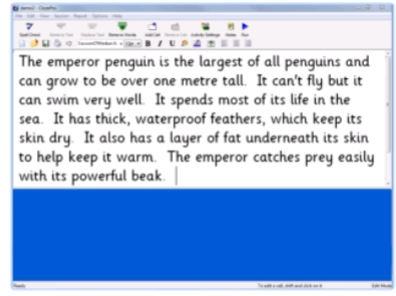
1. Who is the central character? _____
2. What is the main character like? (Describe his/her key qualities or personality traits).
   _____
   _____
3. Who is another important character in the story? _____
4. What is this other important character like? _____
   _____
5. Where and when does the story take place? _____
   _____
6. What is the major problem that the main character is faced with? _____
   _____
7. How does the main character attempt to solve this major problem? _____
   _____
8. What is the twist, surprise, or unexpected development that takes place in the story?
   _____
   _____
9. How is the problem solved or not solved?
   _____
   _____
10. What is the theme or lesson of the story?

Reading and Writing Examples (Glr)

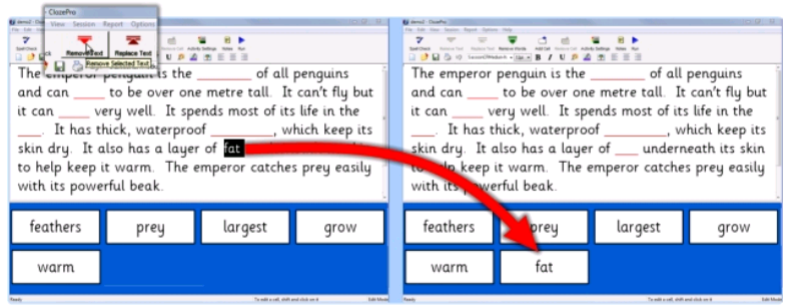
- Writing
  - Use programs with generated word banks so that the retrieval demands during writing are lessened and vocabulary is indirectly expanded by having the student use target words in sentences (e.g., ClozePro)



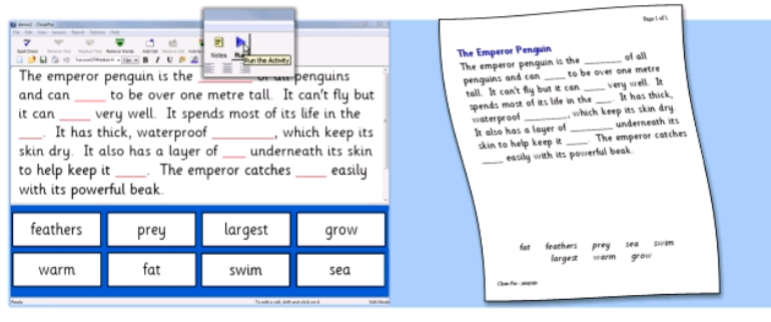
1 Type or paste some text into ClozePro.



2 The text you remove is placed automatically in a 'grid'.



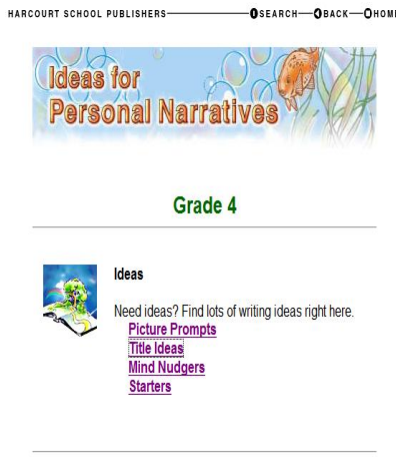
3 Run the activity, or print it as a worksheet for the whole class to use.

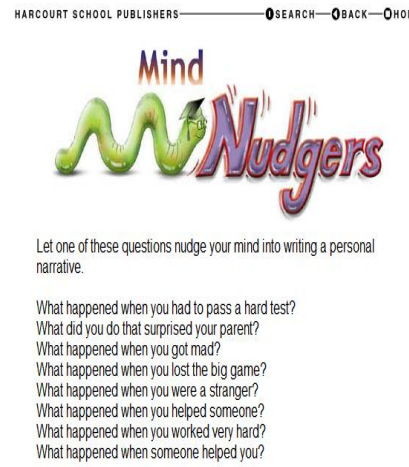


Using Instructional Materials (Glr)

- Use chapter terms such as *"word banks"* for writing activities to facilitate retrieval
- Use *chapter previews* to "prime" background knowledge and help student make associations
- Use *online tools* (e.g., writing prompts)

Harcourt Language (Grade 4)





Manifestations of Cognitive Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011)

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition[1]	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Visual Processing (Gv)	•Ability to analyze and synthesize visual information •The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems (Schneider & McGrew, 2012) •There are many narrow Gv abilities, some of which include Visualization, Speeded Rotation, Closure Speed, Flexibility of Closure, Visual Memory and Spatial Scanning	***Difficulties with***: •Recognizing patterns •Reading maps, graphs, charts •Attending to fine visual detail •Recalling visual information •Appreciation of spatial characteristics of objects (e.g., size, length) •Recognition of spatial orientation of objects	***Reading Difficulties:*** •Orthographic coding (using visual features of letters to decode) •Sight-word acquisition •Using charts and graphs within a text in conjunction with reading •Comprehension of text involving spatial concepts (e.g., social studies text describing physical boundaries, movement of troops along a specified route) ***Math Difficulties:*** •Number alignment during computations •Reading and interpreting graphs, tables, and charts ***Writing Difficulties:*** •Spelling sight words •Spatial planning during writing tasks (e.g., no attention to margins, words that overhang a line) •Inconsistent size, spacing, position, and slant of letters	•Capitalize on students phonemic skills for decoding tasks. •Teach orthographic strategies for decoding (e.g., word length, shape of word); Use "cover, copy, compare" technique – go to: **http://www.amblesideprimary.com/ambleweb/lookcover/lookcover.html** •Provide oral explanation for visual concepts. •Review spatial concepts and support comprehension through use of hands-on activities and manipulatives (e.g., using models to demonstrate the moon's orbital path). •Highlight margins during writing tasks. •Provide direct handwriting practice. •Use graph paper to assist with number alignment.

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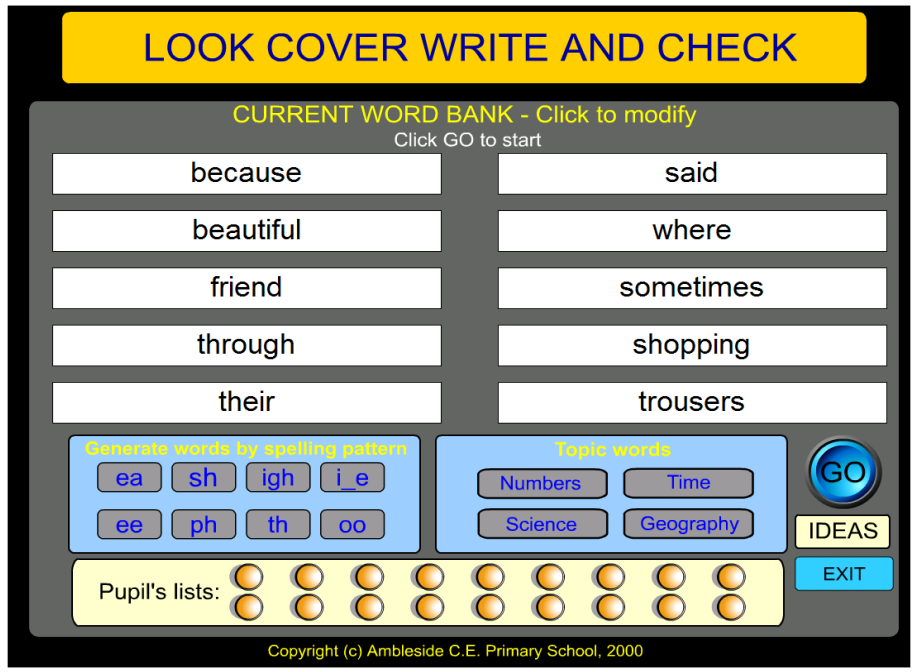
Reading and Writing Examples (Gv)

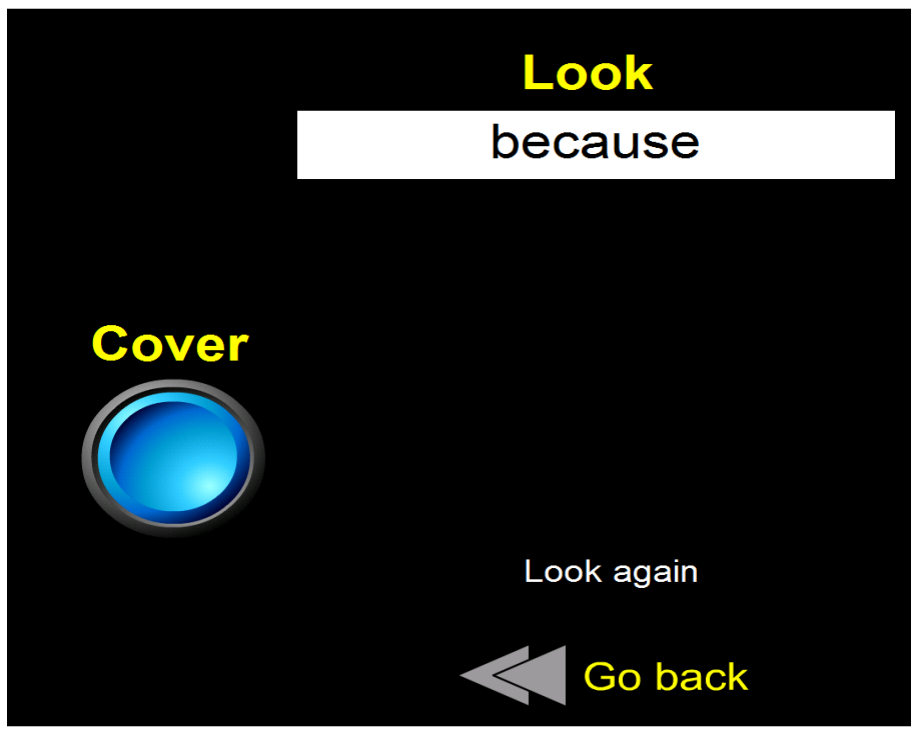
- Writing
  - Cover, Copy, and Compare

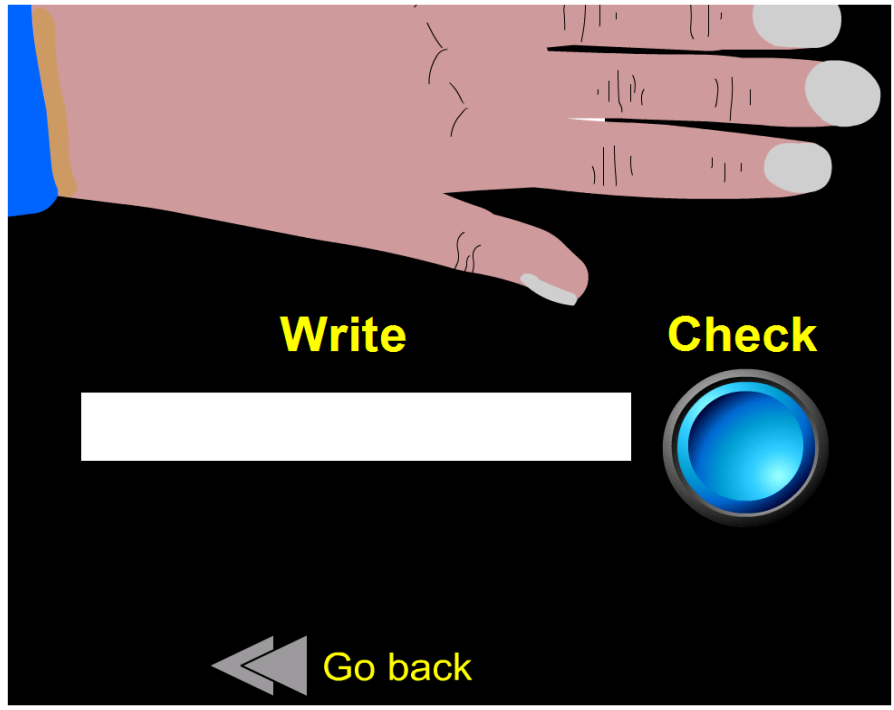
trace, copy, recall: spelling
-- short o words

trace	copy	recall
chopping	_____	_____
product	_____	_____
knock	_____	_____
jogging	_____	_____
dodging	_____	_____
cotton	_____	_____
forgotten	_____	_____

http://www.amblesideprimary.com/ambleweb/lookcover/lookcover.html





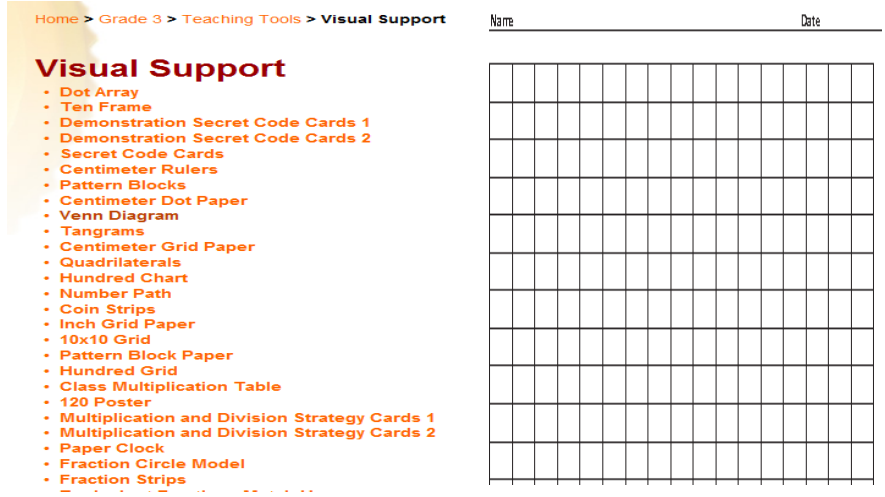


How to Use Instructional Materials

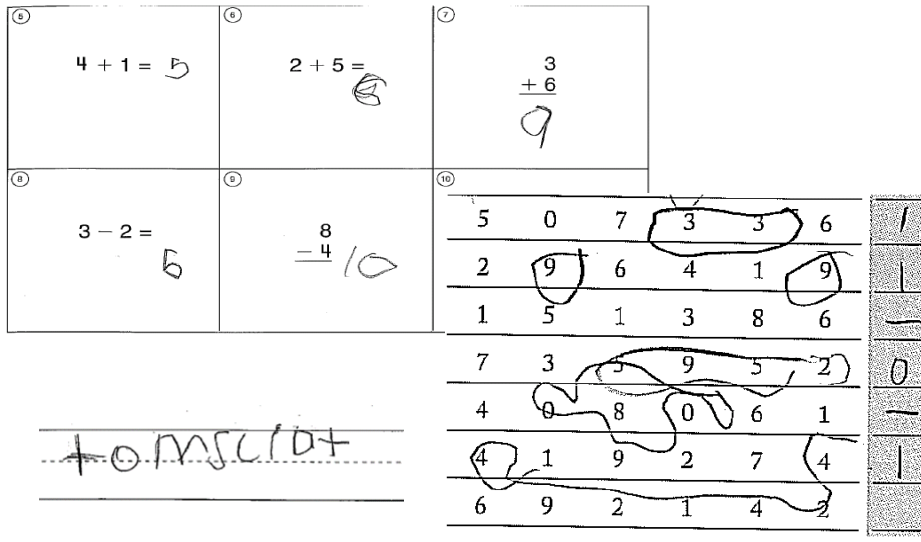
- Visual Features of texts (maps, graphs, models)
- Graphic Organizers online
- “Using Tables, Charts, and Graphs” in Harcourt Science text

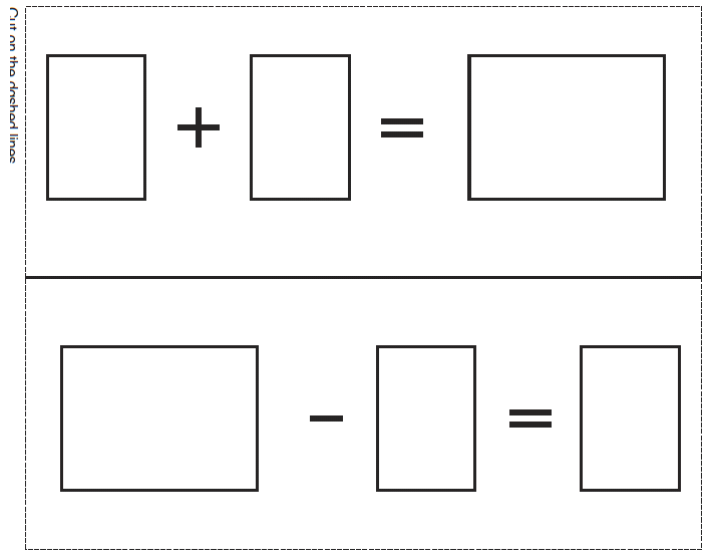
Houghton Mifflin Math Expressions

Houghton Mifflin Math Expressions



Johnny has perceptual-motor, graphomotor difficulties – OT intervention seems warranted; needs visual supports





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CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition[1]	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Processing Speed (Gs)	•Speed of processing, particularly when required to focus attention for 1-3 minutes •Usually measured by tasks that require the ability to perform simple repetitive cognitive tasks quickly and accurately •Narrow Gs abilities include Perceptual Speed, Rate-of-Test-Taking, Number Facility, Reading Speed, and Writing Speed (note that the latter two abilities are also listed under other broad CHC domains, including Grw)	***Difficulties with***: •Efficient processing of information •Quickly perceiving relationships (similarities and differences between stimuli or information) •Working within time parameters •Completing simple, rote tasks quickly	***Reading Difficulties:*** •Slow reading speed, which interferes withcomprehension •Need to reread for understanding ***Math Difficulties:*** •Automatic computations •Computational speed is slow despite accuracy •Slow speed can result in reduced accuracy due to memory decay ***Writing Difficulties:*** •Limited output due to time factors •Labored process results in reduced motivation to produce ***Language Difficulties:*** •Cannot retrieve information quickly – slow, disrupted speech; cannot get out thoughts quickly enough •Is slow to process incoming information, puts demands on memory store which can result in information overload and loss of meaning	•Repeated practice •Speed drills •Online activities/games (e.g., http://www.arcademicskillbuilders.com/games/) •Computer activities that require quick, simple decisions •Extended time •Reducing the quantity of work required (including homework) •Increasing "wait" times both after questions are asked and after responses are given •Choral Repeated Reading •Books on tape

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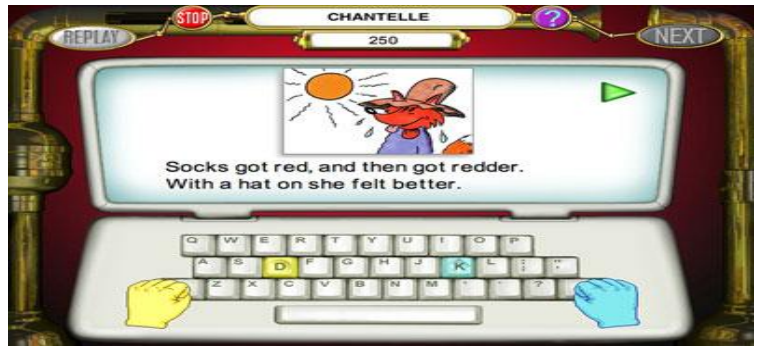
Reading and Writing Examples (Gs)

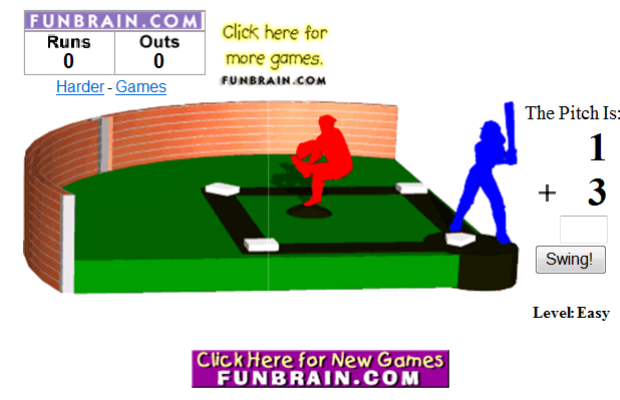
- Writing
- Wordy Qwerty from Talking Fingers

The overall purpose of ***Wordy Qwerty: Foundations for Reading and Writing Fluency***, is to improve phonological and morphological sensitivity, to develop a deeper understanding of how words are constructed in English, and to provide reading and writing activities with helpful feedback, in order to increase fluency and comprehension in reading and writing. **Wordy Qwerty** has 20 lessons, with six activities per lesson, that present the following foundations for fluency:

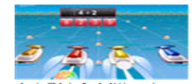
Increasing Fluency in Writing



Write Stories: In these cleverly illustrated 8-line rhymes, children hear and see the first line, and have to type out the second line after it is dictated. They can see and hear the dictated line as often as they need, but get more points if they remember the sentence and try to spell the words correctly. These little stories are full of words that require using the spelling rule just presented.

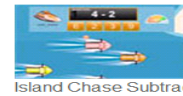


http://www.arcademicskillbuilders.com/games/



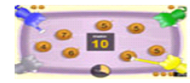
JETSKI ADDITION

Jet Ski Addition is a multi-player racing game for addition. How quickly the student correctly answers the addition problems determines how quickly the jet ski will go.
Game Info | Play



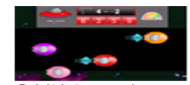
Island Chase SUBTRACTION

Island Chase Subtraction is a multi-player racing game for subtraction. How quickly the student correctly answers the subtraction problem determines how quickly the jet ski will go.
Game Info | Play



Kitten match ADDITION

Kitten Match is a multi-player game for addition. The Student with the most correct combinations wins.
Game Info | Play



ORBIT INTEGERS ADDING INTEGERS

Orbit Integers is a multi-player racing game practing integer addition. How quickly the student correctly answers the problem determines how fast the spaceship will go.
Game Info | Play

Kitten match ADDITION

Kitten Match is a multi-player game for addition. The Student with the most correct combinations wins.
Game Info | Play

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Short-Term Memory (Gsm)	•Ability to hold information in immediate awareness and use or transform it within a few seconds	***Difficulties with:*** •Following multi-step oral and written instructions •Remembering information long enough to apply it •Remembering the sequence of information •Rote memorization •Maintaining one' place in a math problem or train of thought while writing	***Reading Difficulties:*** •Reading comprehension (i.e., understanding what is read) •Decoding multisyllabic words •Orally retelling or paraphrasing what one has read ***Math Difficulties:*** •Rote memorization of facts •Remembering mathematical procedures •Multi-step problems and regrouping •Extracting information to be used in word problems ***Writing Difficulties:*** •Spelling multisyllabic words •Redundancy in writing (word and conceptual levels) •Identifying main idea of a story •Note taking	•Use meaningful stimuli to assist with encoding and allow for experiential learning (i.e., learning while doing) •Provide opportunities for repeated practice and review •Provide supports (e.g., lecture notes, guided notes, study guides, written directions) to supplement oral instruction •Break down instructional steps for student •Provide visual support (e.g., times table) to support acquisition of basic math facts •Outline math procedures for student and provide procedural guides or flashcards for the student to use when approaching problems •Highlight important information within a word problem •have student write all steps and show all work for math computations •Use writing programs or techniques that emphasize drafting first (e.g., Draft Builder 6) •Teach chunking strategies

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Attention	•Attention is a complex and multifaceted construct used when an individual must focus on certain stimuli for information processing. In order to regulate thinking and to complete tasks of daily living such as schoolwork, it is necessary to be able to attend to both auditory and visual stimuli in the environment. Attention can be viewed as the foundation of all other higher-order processing. Attention can be divided into five subareas: selective/focused attention, shifting attention, divided attention, sustained attention, and attentional capacity (Miller) •It is important to identify the exact nature of the attentional problem(s) prior to selecting an intervention, teaching strategies, modifying the curriculum, or making accommodations	•Easily distracted •Lacks attention to detail; makes careless mistakes •Difficulty discerning demands of a task (e.g., where to begin or how to get started) •May only be able to attend to task in short intervals •Difficulty changing activities •Difficulty applying a different strategy when task demands change •Difficulty attending to more than one thing or task at a time •Cannot perform well with faced with multiple stimuli or an abundance of detail	**Reading Difficulties:** •Loses one's place easily •Easily distracted while reading •Does not pick up important details in text **Math Difficulties:** •Does not consistently attend to math signs •Frequent mistakes on word problems **Writing Difficulties:** •Has difficulty completing long assignments; difficulty following time lines	•Provide a quiet place to work in the classroom during seatwork •Provide reinforcement for timely completion of work •Make sure student understands oral directions and has the same directions in written form for reference •Provide a cue when transitioning •Work with student to develop a time line for longer assignments •Allow student to use a computer or dictate longer assignments •Assist student in proofing math and writing assignments •Reduce amount of repetitive seatwork •Build in breaks during longer assignments •Provide structure and highlight critical information in all academic tasks •Provide student with a monitor with whom he or she can check in with once or twice a day (e.g., keeping track of assignments, books, schedule)

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Executive Functioning	•Executive functioning is often understood as two broadly conceptualized areas that are related to the brain's frontal lobes: cognitive control and behavioral/emotional control. The ***cognitive*** aspects of executive functioning includes concept generation (Gc/Glr); problem solving (Gf); attentional shifting (attention; Gs); planning; organizing; working memory (Gsm); and retrieval fluency (Glr). The ***behavioral/emotional*** aspects of executive functioning relate to the inhibitory controls of behavior (e.g., impulsivity, regulation of emotional tone, etc.). (see Miller, 2010; KIDS Inc.)	***Difficulty with:*** • learning new activities, generating concepts, and solving problems • identifying goals and setting goals • planning (e.g., begins project without necessary materials; does not allocate sufficient time to complete task) • sequencing (e.g., may skip steps in multi-step problems) •Prioritizing (e.g., not sure what's important when taking notes) •organization (e.g., loses important papers; fails to turn in completed work; creates unrealistic schedule) •Initiation (e.g., has difficulty getting started on tasks, assignments, etc.) •pace (e.g., often runs out of time on seatwork and exams; has difficulty completing homework due to unrealistic timeline) •shifting between activities flexibly; coping with unforeseen events •self-monitoring (e.g., doesn't check to insure that each step was completed; doesn't check work before submitting it) •emotional control (e.g., may exhibit inappropriate or over-reactive response to situations) *Examples were adapted from Leslie E. Packer, Ph.D. (2003; see also Packer and Pruitt's book, Challenging Kids, Challenged Teachers Woodbine Press, 2010)*	**Reading difficulties:** •sequencing; telling a story chronologically •prioritizing; extracting main idea and other important information •problem solving; drawing inferences from text **Math difficulties:** •sequencing; remembering order of operations •prioritizing; figuring out what is importing when solving word problems •shifting; attending to math signs on a page **Writing difficulties:** •generating ideas to write about •sequencing a story •prioritizing main events in a story	•Assist student in organizing work by explaining (verbally and in writing or through visuals) the steps necessary to complete a task •Use visual schedules and build in time throughout the day to review •Use graphic organizers •Set alarm (on watch or computer) to regulate timing of projects and tasks •Plan and structure transition times and shifts in activities •Break long assignments into smaller, mini-assignments and provide time frames for completing each •Organize work space and minimize clutter; do this on a daily or weekly basis. •Make a checklist for getting through assignments. For example, a student's checklist could include such items as: get out pencil and paper; put name on paper; put due date on paper; read directions; etc. *Examples adapted from LD Online: Copyright 2008 by the National Center for Learning Disabilities, Inc. All rights reserved.*

Thinking Skills

Here at LearningWorks for Kids, we use video games and other digital technologies to improve eight core thinking skills: Focus, Flexibility, Organization, Planning, Self-Awareness, Self-Control, Time Management, and Working Memory. Our thinking skills are derived from years of research into executive functions — the brain-based cognitive skills that manage critical thinking. These thinking skills represent both individual executive functions, as well cognitively-linked categories of two or more executive functions.

Visit the individual thinking skill pages below to learn more about how each skill effects your child's learning and behavior, both at school and at home.

Game Title ▼

Title: 30/30
Category: Productivity, Utility
Platform: iPad, iPhone, iPod Touch
Skills Used: Planning, Time Management

Title: Afterglow
Category: Creativity, Photo/Video, Social Networking
Platform: iPad, iPhone
Skills Used: Flexibility, Planning

Title: AIM
Category: Social Networking
Platform: Android, iPad, iPhone, iPod Touch, Mac, Online, PC
Skills Used: Organization, Self-Awareness, Self-Control, Writing

Flexibility

Flexibility helps your child to adapt and adjust to changing conditions and expectations without becoming frustrated.

Self-Awareness

Self-Awareness helps your child to understand and articulate his own thoughts and feelings as well as the thoughts and feelings of others.

Focus

Focus helps your child start a task without procrastinating and then maintain his attention and effort until it's done.

Self-Control

Self-Control helps your child to manage her feelings and behaviors, and stop herself from acting inappropriately.

Organization

Conclusions