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The Science of Reading: Evidence-based Reading Instruction for Students with Dyslexia

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Literacyhow
Empower teaching excellence.

Our Mission is to
EMPOWER TEACHERS
to ensure that every child learns
to read by third grade.

Our model is research based.
Our approach is values driven.

Literacyhow
Empower teaching excellence.

Literacy is the language of opportunity.

Children are at the heart of all we do.
We believe that every child has the right to read.

We know that 95% can be taught to read.

We believe that teachers—not programs or products—teach students to read, write and spell.

So we empower teachers with the best ways to teach.

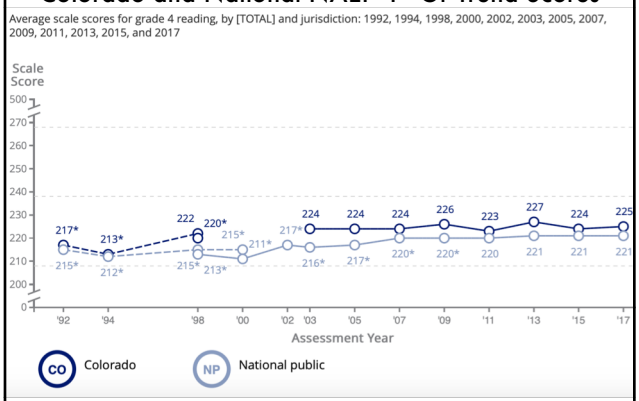
Most Children in Our Country Read Below Grade Level

64% of the Nation's 4th graders read **below grade** level.

Yet 95% of ALL children can learn to read! *(Torgesen, 2004)*

http://nces.ed.gov/nationsreportcard/naepdata/

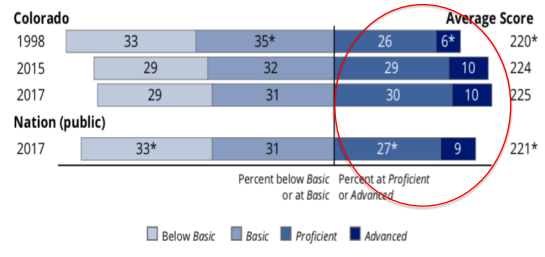
Colorado and National NAEP 4th Gr Trend Scores



National Assessment of Educational Progress (NAEP)

2017 Reading State Snapshot Report
Colorado • Grade 4 • Public Schools

Achievement-Level Percentages and Average Score Results



40% (CO) vs. 36% (US) of our students are reading on grade level

Early Intervention is Clearly Effective

- Prevention studies commonly show that 70- 90% of at risk children (bottom 20%) in K- 2 can learn to read in average range. Prevent automaticity problems.

Why Focus on Prevention & Early Intervention?

- 88% of students reading poorly at the end of first grade will read poorly at the end of the fourth grade.
- Unless effective reading instruction is provided, students reading poorly at the end of the fourth grade will have reading difficulties for the rest of their lives!
- Effective prevention programs demand shared responsibility and a common language.
- Teachers need to learn the science of teaching reading to ensure that ***all*** children learn to read to succeed in school and in life!

Literacy How, Inc.

Today's Learning Objectives

1. To present the science of the reading brain
2. To explain evidence-based instruction for ***all*** students, including those with dyslexia
3. To define and describe the core components of comprehensive literacy (phonemic awareness, phonics (decoding and encoding/spelling), reading fluency, vocabulary, text comprehension (syntax too!) and written expression (and dispel a few myths)

THE NEUROBIOLOGY OF READING

The Science of Teaching Reading

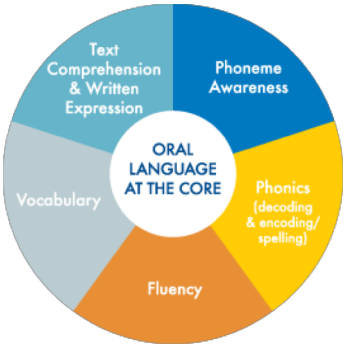
Reading is complex!!! Teaching reading successfully requires a teacher who understands the reading process, assessment, and different forms of instruction to ensure that instruction is comprehensive and successful.

Teachers must know which programs are based upon solid evidence-based principles and are effective, and which programs are based on (incorrect) beliefs, philosophies, anecdotes, and untested assumptions.

One rule of thumb is that '**the more difficulties kids are having with learning to read, the more systematic and direct the instruction must be**.'

Reid Lyon, 2008

The First Literacy How Reading Wheel National Reading Panel Report (2000)



5 Big Ideas:

- Phonemic Awareness
- Phonics
- Fluency
- Vocabulary
- Comprehension

Myth: Reading is Natural

"Reading print is as natural as reading faces. Learning to read should be as natural as any other comprehensible aspect of existence."

Frank Smith, 2003

Corollary to this: If you can read, you can teach someone to read.

Reality

Learning to read is **NOT** natural.
Our brains are wired for oral language but reading is a relatively new cultural invention. Therefore, children must be taught explicitly and systematically to apply the code -- not in a kill and drill mentality that may have been applied in olden days, but in an interactive, developmentally-appropriate, and engaging manner.

The Reading Brain

"Each new reader comes to reading with a 'fresh' brain -- one that is programmed to speak, see, and think, but not read. Reading requires the brain to rearrange its original parts to learn something new."
(Maryanne Wolf)

"Teaching reading is rocket science."
(Louisa Moats)

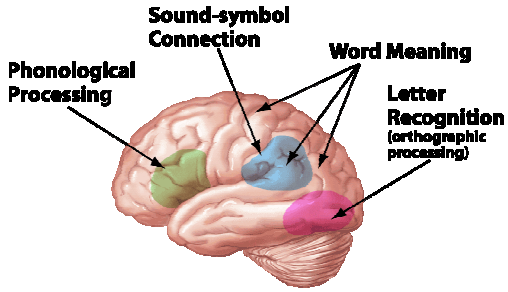
All students need to know the structure of English – that is, our language is based on an alphabet (phonemic) and meaning (morpho). English is ***morphophonemic.***
Example: health is pronounced /h/ /e/ /l/ /th/ but is spelled with an ***ea*** because it has the root ***heal*** in it.

Early Brain Development: Everything Matters!

- Visual and auditory development
- Cognitive development
- Language development
- Social development
- Emotional development

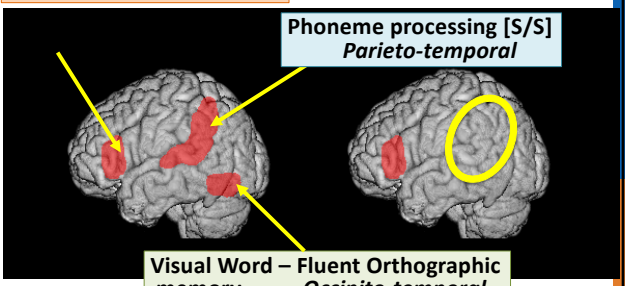
Maryanne Wolf, 2009

Areas of the Brain Used for Reading



Neurobiology of Dyslexia

Articulation/Word analysis
Interior frontal gyrus



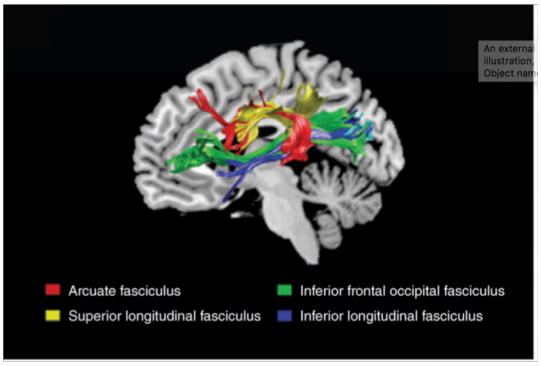
Typical Readers **Dyslexic Readers**

Dyslexia

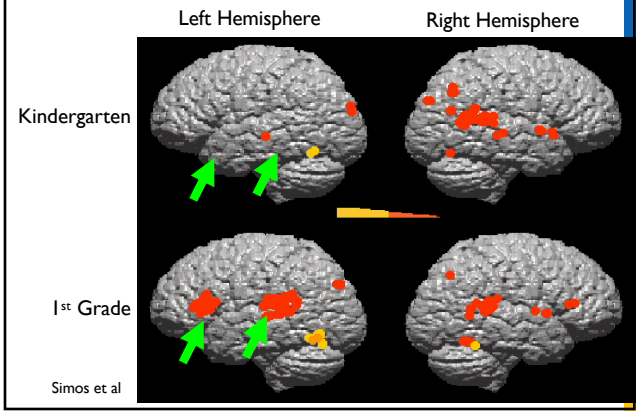
- Is a *language-based* problem
- Does not mean seeing things backwards
- Exists across all levels of intelligence
- Is not caused by a lack of motivation
- Occurs at all socioeconomic levels
- Occurs slightly more often in boys than in girls
- May develop even with good classroom instruction
- Often occurs with other disorders

Moats and Dakin, 2008

White Matter Pathways

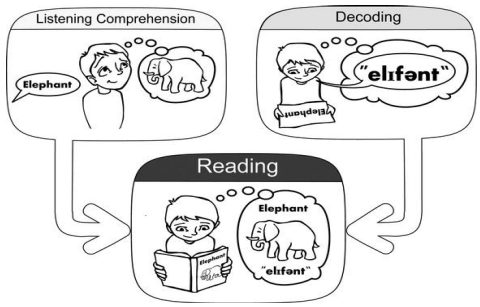


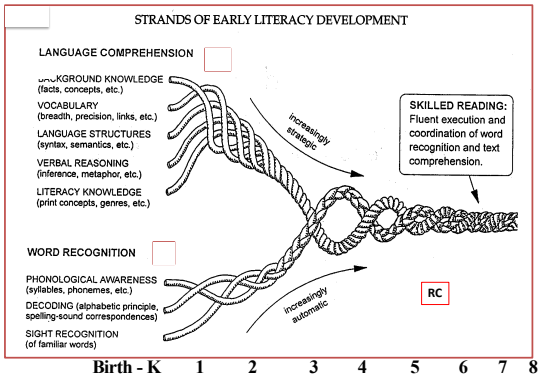
At Risk Reader



The Simple View of Reading
(Gough & Tunmer, 1986)

LC X D = RC





Source: Neuman, Susan B. and Dickinson, David K., "Handbook of Early Literacy Research" Adapted from the work of Hollis Scarborough, 2001

Simple View of Reading (D x LC = RC)
(Gough & Tunmer, 1986)

		Phonological Skills	
		Poor Word Reading	*Good Word Reading*
Nonphonological Language Skills	*Poor Comprehension*	Mixed Reading Disability (weak phonological processing AND comprehension-related issues)	Specific Comprehension Deficit (weak vocab, morphology, syntax, discourse-level processing & comp strategies)
	Good Comprehension	**Dyslexic/RD** (phonological processing problems - including difficulties with decoding and encoding)	Skilled readers

Important Research Findings

3. Dyslexia occurs as part of a natural, unbroken continuum of ability-- what causes good reading also causes poor reading (Shaywitz et al., 1992).

We only need one theory to explain success and failure in reading.

Students with Reading Difficulties: A **Continuum** of Severity ....

Mild → Moderate → Severe

...that requires a **continuum** of instruction

Tier 1 → Tier 2 → Tier 3

...and increasing amounts of teacher knowledge and expertise

High →

WHAT IS EVIDENCE-BASED INSTRUCTION?

Research-based vs. Evidence-based

Research-based means that the program or instructional approach is based on what research has demonstrated that works.

If we want to know if that program/approach is **effective,** evidence must be gathered using that specific program/approach. If that evidence shows that the program/approach is effective, then we can call that practice **evidence-based.**

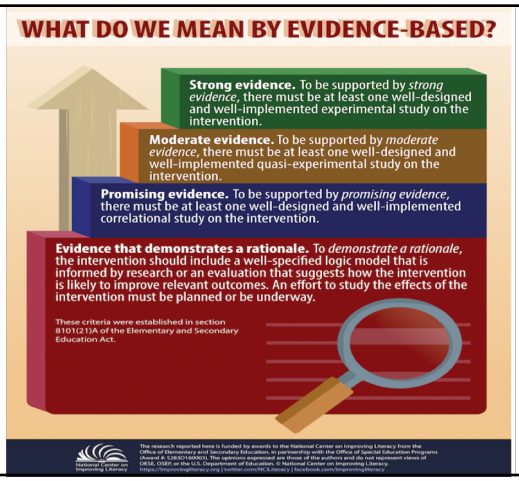
The Voice of Evidence, *McCardle and Chhabra, 2004*

What does evidence-based mean?

An intervention that is supported by evidence from well-conducted research studies (4 criteria):

- Uses a sound design (comparison group)
- Based on high quality data analysis
- Peer-reviewed (other researchers review the study)
- Converging evidence (these findings are consistent with other studies)

According to ESEA, and amended by ESSA, it is an intervention, tool, or practice that meets one of the following 4 evidence levels



Reading Intervention

- Instructional approaches and programs designed to either ***prevent*** or ***remediate*** persistent reading difficulties
- ***Prevention*** programs focus on at risk children with limited amounts of crucial reading-related knowledge, skills and experience at school entry.
- ***Remedial*** programs target students who are failing to make adequate progress in learning to read.

Tunmer, 2008 *http://ies.ed.gov/ncee/wwc/aboutus.aspx*

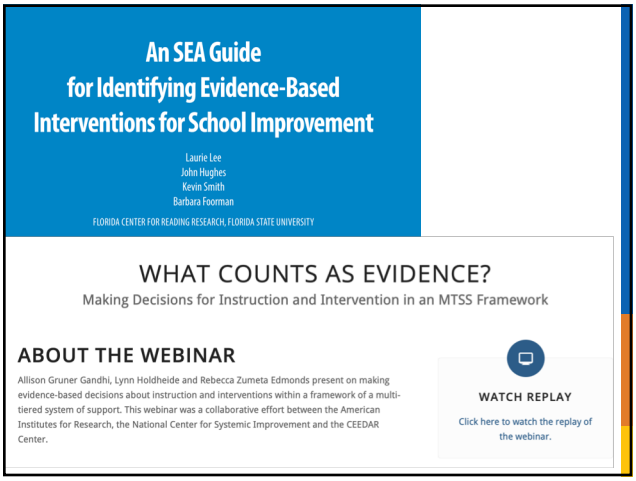
What is intensive intervention?

Intensive intervention is designed to address *severe and persistent* learning or behavior difficulties. Intensive interventions should be:

(a)Driven by data

(b)Characterized by increased intensity (e.g., smaller group, expanded time) and individualization of academic instruction and/or behavioral supports

http://*www.intensiveintervention.org*



Differentiate: One Size Does Not Fit All

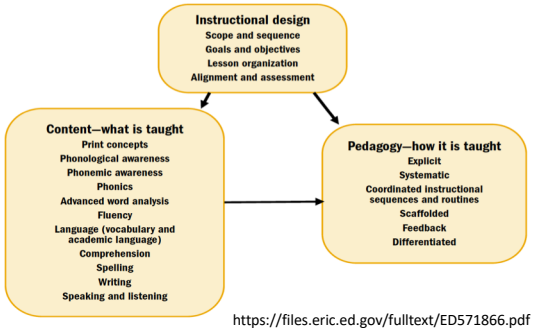
Three profiles of students who struggle:

1. ***Students with phonologically-based reading difficulties who need to focus on accurate and automatic word recognition (i.e. dyslexia)***
2. Students with language comprehension-based reading difficulties who need to focus on oral language and vocabulary.
3. Students who have difficulties with both word recognition and language comprehension

Each profile ***may*** have different causes (e.g., LD/dyslexia, inadequate instruction, limited exposure to English language and literacy). *The Power of RTI and Reading Profiles (2014),* Spear-Swerling

Rubric for Evaluating K-5 ELA Materials

Figure 1. Elements of design for reading/language arts instructional materials



https://files.eric.ed.gov/fulltext/ED571866.pdf

Source: Authors' construction.

Standard Treatment Protocol

- A single, consistent intervention is used
- This ensures accurate implementation – that is, treatment fidelity.
- The interventionists must receive comprehensive training.
- 'They also need to receive ongoing support and professional development while delivering the standard treatment protocol procedures to ensure that the intervention is delivered correctly.'

Key Questions About the Secondary Intervention

- Has the student been taught using an evidence-based secondary intervention program (if available) that is appropriate for his or her needs?
- Has the program been implemented with fidelity?
  - Content
  - Dosage/schedule
  - Group size
- Has the program been implemented for a sufficient amount of time to determine response?

http://www.intensiveintervention.org

Problem-Solving Approach

The student intervention teams meet to discuss what will work best for the individual student. This team will use a menu of intervention options that begins with assessment data that is diagnostic in nature so that the student will receive an intervention that is matched to his/her profile and academic needs.

'**… the quality of the instruction depends on the skills, knowledge, and training of the team personnel who plan each individualized program**.'
http://iris.peabody.vanderbilt.edu/module/rti01-overview/cresource/q2/p05/

Establish a Menu of Interventions (an EXAMPLE)

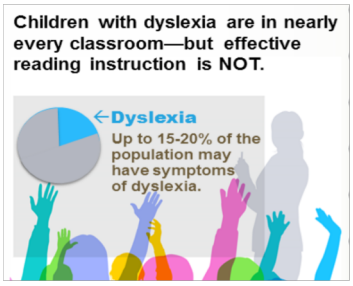
Phonemic Awareness	Phonics	Fluency	Vocabulary	Text Comprehension
Road to the Code	Guided reading w/ decodable text	Repeated Reading	Intentional word selection	Text Structure ***SGM/Braidy***
Say It and Move It	***Lexia***	Words and Phrases	***Word Heroes***	***Questioning the Author***
Phoneme Grapheme Mapping	Phoneme Grapheme Mapping	***RAVE-O***	***Lexia***	Reciprocal Teaching (Strategies)
LiPS	Word Sorts	***Read Naturally***	***Word Gen***	***Making Meaning***
	Wilson			

Structured Literacy Instruction Includes Two Important Components

- Elements of language are taught to address the language basis of the LD/RD – for example, sounds and symbols, meaning (semantics), and sentence structure (syntax).
- Principles of instruction that guide how the elements are taught (for example, explicit, cumulative, and diagnostic teaching).

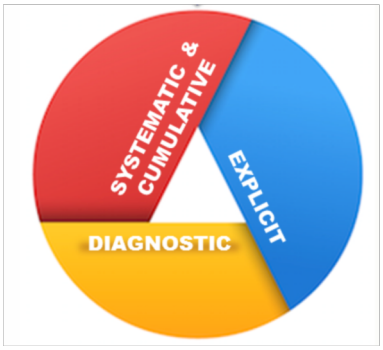
Structured Literacy Instruction

- Elements of language
- Principles of instruction



https://dyslexiaida.org/effective-reading-instruction/

Principles of Structured Literacy



Principles of Instruction

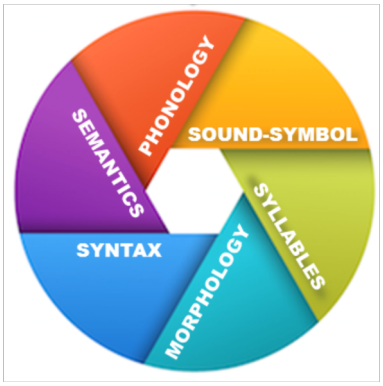
- **Explicit**: Deliberate teaching of all concepts with continuous student-teacher interaction
- **Systematic**: Material follows the logical order of the language from easier to more difficult and each skill/step requires mastery before moving on
- **Cumulative**: Each step is based on previously learned concepts
- **Diagnostic:** Instruction is individualized based on formal and informal data including observation of reading behaviors
- **Prescriptive**: Scaffolds used to manage the level of difficulty and corrective feedback is given so students know how monitor their reading errors

Present Information Using More Than One Modality

- Speak and write/draw/project information as you present it.
- Repeat important instructions, key words, etc.
- Model procedures to provide students with a visual image of the steps.
- Teach students to visualize information in text, including stories, word problems, etc.

National Center on Intensive Intervention

Elements of Structured Literacy



- **Phonology**-say *bloom* Now say it again, but don't say /m/….don't say /l/
- **Sound-Symbo**l-How many sounds in the following word? How many letters represent those sounds?
- **Syllables**- *literacy*
- **Morphology-** intro spect ive
- **Semantics**- Here are tips that safety experts say could help you ***survive*** some tight spots.
- **Syntax**- *The dog who ran to the kitchen door and who barked furiously at the cat had thick dark brown fur.*

Structured Literacy Interventions

These interventions use an approach that includes several important characteristics:

- Data-driven
- Diagnostic and prescriptive
- Explicit and direct
- Language-based
- Multisensory with Immediate corrective feedback
- Sequential and cumulative
- Systematic

4 Types of Assessments

TYPE	DESCRIPTION/USE	PURPOSE
Outcome (Summative) Formal	Evaluate success of a program or a school based on student performance after instruction is completed (standardized).	"Reaching our goals"
Universal Screening (Formative) Formal	Identify students who need more intense assessment to determine the potential for intervention. External benchmarks or norms are used.	"First Alert"
Progress Monitoring (Formative) Formal	Determine student progress over time as compared to a validated trajectory and to plan differentiated instruction.	"Growth Charts"
Diagnostic (Formative) Formal or informal	Understand student performance in authentic context, especially to inform instruction and intervention strategies. These are most closely aligned with instruction.	"In-depth View"

Some General Remedial Principles

- Remedial interventions must increase intensity and differentiation, so the first steps are to increase time on task, reduce the size of the instructional group, and differentiate
- Whenever possible, interventions should supplement, not supplant
- No intervention is effective if it does not involve the academic skill itself (must read, do math, and write)
- The longer intervention is delayed, the slower the response (on average) and the greater the need for intensity
- Intervention always begins in the general education classroom
- Effective interventions include a self- regulation component
- Progress must be assessed at all levels

Complex Therapies in Reading and Dyslexia

Effects stronger if interventions are:

- more explicit
- increase time on task (i.e., supplement, not supplant; Vaughn)
- reduce size of instructional group (small group, not 1:1; Vaughn)
- More comprehensive (multi-component; Mathes, Denton) and include self-regulation component
- differentiate according to instructional needs in the domain of interest (Connor)
- Teach in the context of academic content

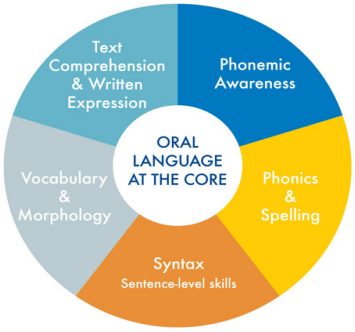
THE CORE COMPONENTS OF COMPREHENSIVE LITERACY

Comprehensive Literacy Instruction

NRP (2000)	Literacy How Reading Wheel (2009)	CCSS (2010)	Structured Literacy (IDA) (2015)
Phonemic Awareness	Phonemic Awareness	Foundational Skills (PA)	Phonology
Phonics	Phonics/ Spelling	Foundational Skills (Phonics)	Sound-Symbols Syllable Instruction
Fluency	Syntax (in lieu of Fluency)	Foundational Skills/Language	Syntax
Vocabulary	Vocabulary and Morphology	Language/ Foundational Skills	Morphology Semantics
Comprehension	Comprehension Written Expression	Reading Literature and Informational Text Writing	Semantics
	Oral Language	Speaking and Listening	All instruction is based on rich OL

The Literacy How Reading Wheel

The Core Components of Comprehensive Literacy Instruction



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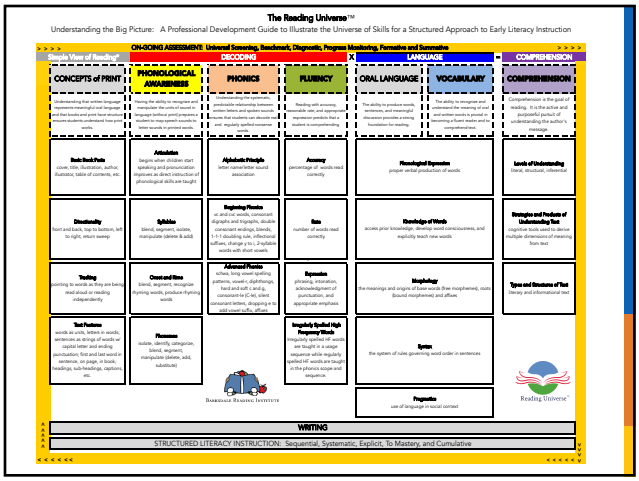
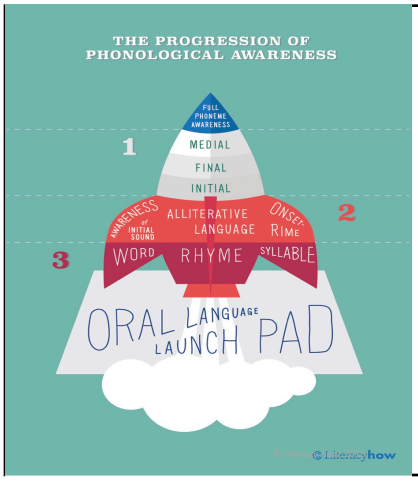


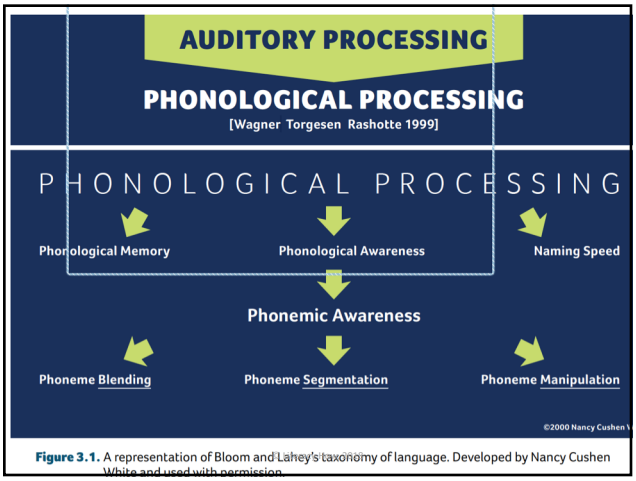
1. Phonemic Awareness

Phonemic awareness is an awareness of and the ability to manipulate the individual sounds (phonemes) in spoken words.

All students benefit from explicit instruction in phonemic awareness, segmenting and blending the sounds in words.



Phonological Awareness develops sequentially, so we begin where the student is in that progression.



Sound Articulation

- Should be clear and precise
- Consonants should be pure sounds without an added vowel or /uh/

Practice: Segment the sounds in crest

/k/ /r/ /e/ /s/ /t/ c r e s t

/kuh//ruh//e//suh//tuh/ = cŭ rŭ esŭ tŭ

The Alphabetic Principle

- Chinese writing (logographic) vs. alphabetic writing
- We don't write words! We write sequences of phonemes in spoken words.
- Poor access to the phonemes makes reading alphabetic languages very difficult.
- Phoneme skills are needed for BOTH sounding out new words AND remembering the words we read.
- Orthographic processing involves unlocking language from vision which is ALSO needed to read words.

David Kilpatrick, 2018

Grapheme = Letter(s)

- symbols of the writing system
- one or more letters that represent one speech sound or phoneme
- categorized as **consonants** and **vowels**

2. Phonics

Phonics is the study and use of sound/spelling correspondences and syllable patterns to help students read written words.

Myth: Phonics

The English language is so irregular and inconsistent in its spellings, it is unnecessary to teach children the letter-sound correspondences that form the basis of phonics instruction - and it is a waste of time to teach the rules of the language.

Reality

Within syllables, vowel spellings conform with seven vowel patterns (Henry, 1993; Chaney & Cohen, 1999). Five of those vowel syllable patterns effectively predict vowels in about 85% of English words (May, 1998).

Teaching Phonics or "The Code"

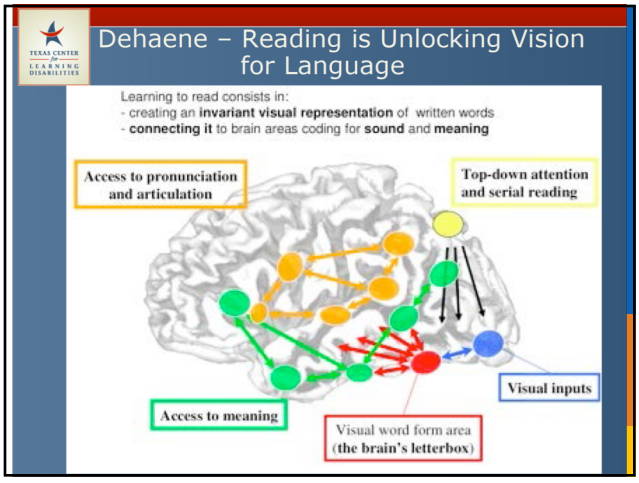
- Reading or "Decoding" is applying sound-symbol associations and blending sounds together.
  - Begin with VC words (most transparent pattern)
- Spelling or "Encoding" is segmenting words by sounds and applying sound-symbol correspondences (upper levels apply spelling patterns and rules).
- Reading and spelling are reciprocal skills.

Orthographic Mapping

The process readers use to store written words for immediate, effortless retrieval. It is the means by which readers turn unfamiliar written words into familiar, instantaneously accessible sight words.

This explains how readers build a sight vocabulary.

David A. Kilpatrick, 2015



What is a Sight Word

- A word that is recognized instantly regardless of whether or not it is phonetically regular or irregular. It is known as a familiar word rather than an unfamiliar word.
- An unfamiliar 'sight word' is one that children either try to sound out or guess.
- A sight vocabulary is a pool of words that an individual can instantly and effortlessly recognize.

David A. Kilpatrick, 2015

Syllable Instruction

- Concept of a syllable – one vowel sound
- Six basic syllable types
- Key to determining the sound of the vowel in each syllable
- Syllable division rules support multisyllabic reading accuracy and automaticity.

The Six Syllable Patterns

Syllable type	Pattern	Vowel sound	Examples
Closed		Short vowel	
Open		Long vowel	
Silent e		Long vowel	
Vowel teams • Talker pattern • Whiner pattern		Long vowel Vowel sound is neither long nor short but a different sound called a diphthong	
R controlled		Vowel sound is neither long nor short but is influenced by r that follows the vowel letter	far, for, her, fir, fur
Consonant le			

Effective Intervention

- Teach phonological awareness and phonics EXPLICITLY with an approach that includes comprehension and fluency components (NRP about explicitness, not phonics)
- Prevent word recognition problems because remediation is difficult and requires considerable intensity, especially for automaticity
- Older students and adults can be taught word recognition if the approach is sufficiently intense. Fluency more difficult.
- No "dyslexia specificity" of appropriate interventions. Traditional service delivery models ineffective

Proactive Intervention (Mathes, Torgesen)

- Explicit instruction in synthetic phonics, with emphasis on fluency.
- Integrates decoding, fluency, and comprehension strategies.
- 100% decodable text
- Carefully constructed scope and sequence designed to prevent possible confusions.
- Every activity taught to 100% mastery everyday.

Responsive Intervention (Denton)

- Explicit instruction in synthetic phonics and in analogy phonics
- Teaches decoding, using the alphabetic principle, fluency, and comprehension strategies in the context of reading and writing
- No pre-determined scope and sequence
- Teachers respond to student needs as they are observed.
- Leveled text not phonetically decodable

3. Vocabulary

Vocabulary refers to the body of words and their meanings that students must understand to comprehend text.

Comprehension Depends on Knowing Word Meanings

- Vocabulary knowledge is strongly related to overall reading comprehension.
- If a word is decoded and pronounced but the meaning is not recognized, comprehension will be impaired.
- Knowledge of a word's meaning also facilitates accurate word recognition.

Principles of Effective Vocabulary Instruction

- Present word(s) using child-friendly definitions.
- Draw attention to orthographic (spelling) and phonological (sound) representation.
- Engage students in repeated use of word(s) in different contexts.
- Teach words in categories.
- Make the word meaning visual.

Brick and Mortar Words

(Dutro and Moran, 2003)

Specialized Academic Vocabulary: Bricks

Content Specific/ Technological Words

democracy, mammal, numerator

General Academic Vocabulary: Mortar

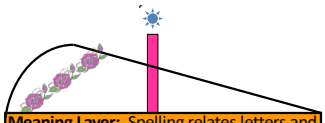
Utility words to hold bricks together

evidence, nevertheless, consequently, dependent

Brick Words

Content (Brick) Words		
Multiple Meaning (Polysemy)	Morphological Elements	Word Networks
bat (animal, action, sport equipment)	**bat/bats**	**bat**, mammal, habitat, sonar[3]
season (time of year, flavoring for food)	**seasons**, **seasoning**, **seasoned**, **season**	**season**, climate, weather, environment, temperature, geography
bat, as part of common phrases or idioms (e.g., ***bat*** *your eyes, go to* ***bat*** *for someone*) **blue** (a color, a feeling of dejection) and as part of a common phrase or idiom (e.g., *out of the* ***blue***, meaning suddenly)	**seasonal (-al)**, **batty (-y)**, **unlock (un-), reread (re-)**, **bluest (-est)**[6] **evaporate, -s, -ed, -ion** for evaporates, evaporated, and evaporation	**evaporation**, liquid, gas, atmosphere, moisture

English Orthography: 3 layers



Meaning Layer: Spelling relates letters and letter patterns to units of meaning.

Pattern Layer: Letters combine to form patterns within syllables, and there are also patterns that occur where syllables meet within a word.

Alphabetic Layer: Letters can be matched to sounds and written in left-to right sequence.

4. Morphology

morphe = form -logy = to study

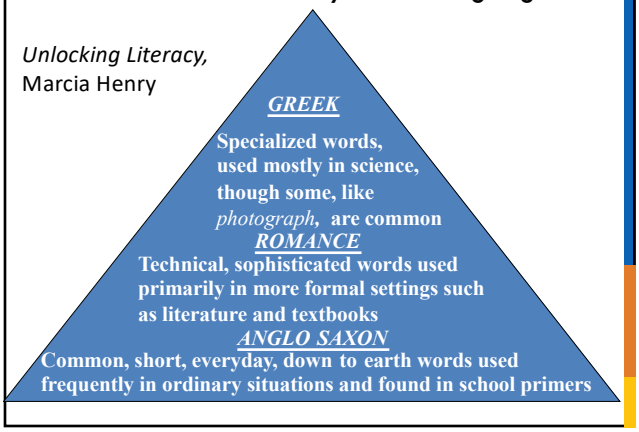
Morphology: The study of meaningful units of language and how those units are combined in words

Morpheme: A morpheme is the smallest meaningful unit or form in a language.

The goal of morphology instruction is to improve word identification, spelling, and vocabulary.

Structural Clues: Layers of Language

Unlocking Literacy,
Marcia Henry



Characteristics of Words According to Language of Origin

Language of Origin	Features of Words	Examples
Anglo-Saxon (Old English)	short, 1-syllable; common words; irregular spellings	sky, earth, moon, sun, water, sheep, dog, hen, horse, cow, fish
Norman French	soft c and g; special endings; words for food, fashion	amuse, cousin, cuisine, country, peace, triage, rouge, baguette, unique
Latin / Romance	multi-syllable words with prefixes, roots, suffixes; content words	firmament, terrestrial, solar, stellar, equine, aquarium, mammal
Greek	combinations of forms; science and math terminology	hypnosis, agnostic, neuropsychology, decathlon, chemistry

Louisa Moats, 2008

5. Fluency

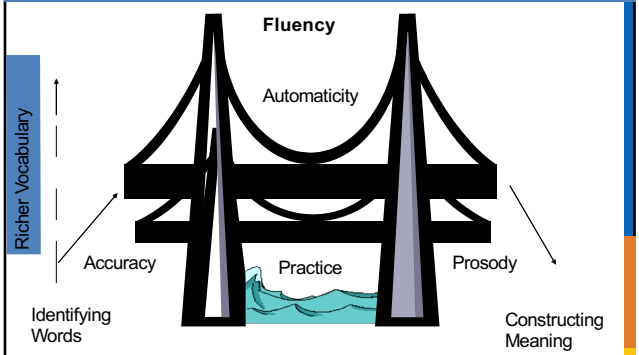
Reading fluency refers to reading text with sufficient speed, accuracy and expression to support comprehension.

Myth: *Fluent readers skim words as they read, predicting what will come next based on the context of the passage.*

Reality

- Good readers read every word and can recognize a word both in and out of context.
- Fluent readers decode every word automatically and monitor comprehension.
- Unskilled readers with weak decoding skills over-rely on context.

Fluency is the bridge between the ability to identify words and the ability to comprehend text.



Adapted from Pikulski & Chard (2005)

What It Takes to Be a Fluent Reader

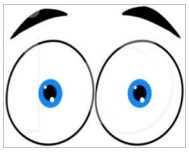
- Accuracy (know the spelling patterns)
- Automaticity (recognize and apply the patterns in words instantly – i.e., less than one second)
- Phrasing (group the words in grammatical entities – i.e., elaborated noun phrases, prepositional phrases, verb + adverb phrases)
- Intonation (read it as though you're telling someone a story or conveying information)

A gigantic oak tree in my back yard was covered with acorns throughout the fall.

Dyslexia and Fluency

What To Do	What Not To Do
Develop accurate reading using decodable text.	Promote memorization of sight words.
Use repeated reading to develop prosody.	Emphasize speed.
Understand that oral reading is difficult for most students.	Use the 3 Cueing System model.
	Drill and kill.

Naming Speed = Slow Word Perception



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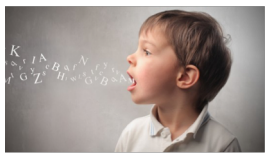


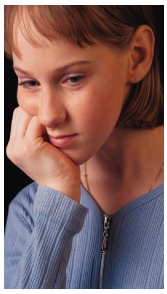
Slow Visual – Verbal Highway

Martha Denckla

Double Deficit Hypothesis

- Deficit in phonemic awareness
- Deficit in automatic retrieval of sounds and words, called rapid automatic naming

Maryanne Wolf

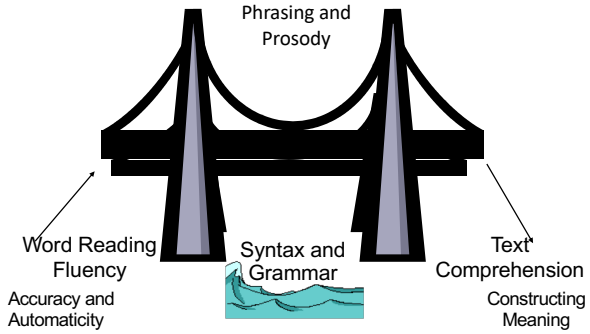


Oral Reading Fluency Norms

Grade	Percentile	Fall WCPM*	Winter WCPM*	Spring WCPM*
1	90		97	116
	75		59	91
	50		29	60
	25		16	34
	10		9	18
2	90	111	131	148
	75	84	109	124
	50	50	84	100
	25	36	59	72
	10	23	35	43
3	90	134	161	166
	75	104	137	139
	50	83	97	112
	25	59	79	91
	10	40	62	63

Grade	Percentile	Fall WCPM*	Winter WCPM*	Spring WCPM*
4	90	153	168	184
	75	125	143	160
	50	94	120	133
	25	75	95	105
	10	60	71	83
5	90	179	183	195
	75	153	160	169
	50	121	133	146
	25	87	109	119
	10	64	84	102
6	90	185	195	204
	75	159	166	173
	50	132	145	146
	25	112	116	122
	10	89	91	91

Syntax is the bridge between word reading fluency and text comprehension.



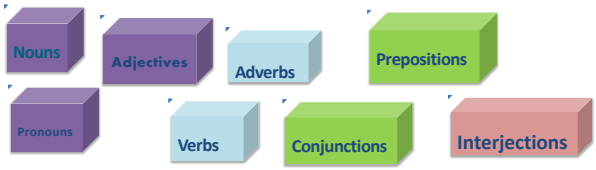
6. Syntax

- Sentence structure: words, phrases and clauses (independent and dependent)
- The set of principles that dictate the sequence and function of words in a sentence in order to convey meaning
- Includes grammar, sentence variation, and mechanics of language

"If a reader can not derive meaning from individual sentences that make up a text, that is going to be a major obstacle in text-level comprehension."

Scott, 2009

8 Grammatical Building Blocks



- Each "block" serves a specific, meaning-based function.
- Together, they provide the basis for all of the syntactic structures in English.

7. Text Comprehension

Text comprehension, the ability to make meaning, is the ultimate goal of reading. It requires specific skills and strategies, vocabulary, background knowledge and verbal reasoning skills (Hollis Scarborough's Braid).

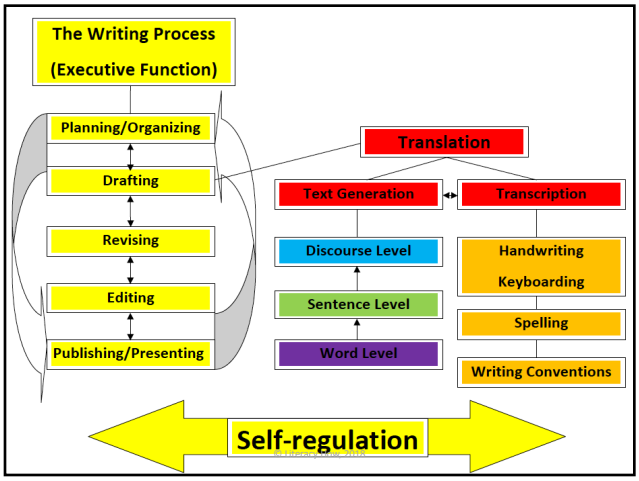
Skilled Comprehenders …

- understand words and integrate their meaning into a **mental model** of the text *(Perfetti, Stafura, and Adolf, 2013).*
- attend to the content, shift their attention to what is important, connect what they are reading to related content from text or background … striving for **coherence** *(Beck & McKeown, 2006)*
- use their knowledge of the subject to facilitate comprehension.
- **observe a comprehension process rather than a product.**

8. Written Expression: A Complex Process

Writing requires the simultaneous and sequential integration of many subprocesses:

- Lower-level skills
  - Handwriting (gross and fine motor)
  - Spelling
- Higher-level (language and higher order cognition)
  - Sentence structure
  - Text structure (narrative vs. expository)
  - Ideation
  - Vocabulary
  - Executive Functions (i.e., attention, organization, working memory, self-monitoring)



Technology: The Great Equalizer

- CAST is an educational research & development organization that works to expand learning opportunities for all individuals through Universal Design for Learning (UDL). www.cast.org
- Bookshare provides a free library of over 475,000 titles (www.bookshare.org)
- Learning Ally (Reading for the Blind and Dyslexia) provides audiobooks and textbooks to students with LD (www.learningally.org)
- http://readeasy.si.edu/

Reading Process Supports

- Electronic Text
- Text to Speech
- Scan to Read/OCR

Building a Biliterate Brain

- The future of the reading circuit will require the limits and possibilities of the literacy-based circuit and the digital-based ones.
- Young readers need to be expert, flexible 'code switchers' between print and digital mediums.
- Children should learn the rules, characteristics, and purposes of each medium.

Maryanne Wolf, *Reader Come Home*

How do we teach teachers the core components of comprehensive literacy?

One teacher at a time ….
Through embedded PD

Professional Development Outcomes

PROFESSIONAL DEVELOPMENT ELEMENTS	KNOWLEDGE LEVEL (Estimate percentage of participants understanding content)	SKILL ATTAINMENT (Estimate percentage of participants demonstrating proficiency in the instructional practices)	TRANSFER TO PRACTICE (Estimate percentage of participants regularly implementing instructional practices in the classroom)
Theory (e.g., presenter explains content—what it is, why it is important and how to teach it)	10%	5%	0%
Demonstration (e.g., presenter models instructional practices)	30%	20%	0%
Practice (e.g., participants implement instructional practices during the session()	60%	60%	5%
Coaching (e.g., participants receive ongoing support and guidance when they return to the classroom)	95%	95%	99%

Bruce Joyce and Beverly Showers. *Student Achievement through Staff Development* (3rd ed: 2002.

Expert Teaching is the Treatment

"One of the most important conclusions from research is that for children with learning problems, learning is hard work. A corollary to this finding is that for their teachers, instruction is very hard work and requires an enormous amount of training and support. Children who have difficulty learning to read or completing mathematics problems will likely not benefit from 'more of the same' but require an **alternative method of teaching** to assist their learning."

Semrud-Clikeman, 2005

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Thank You!

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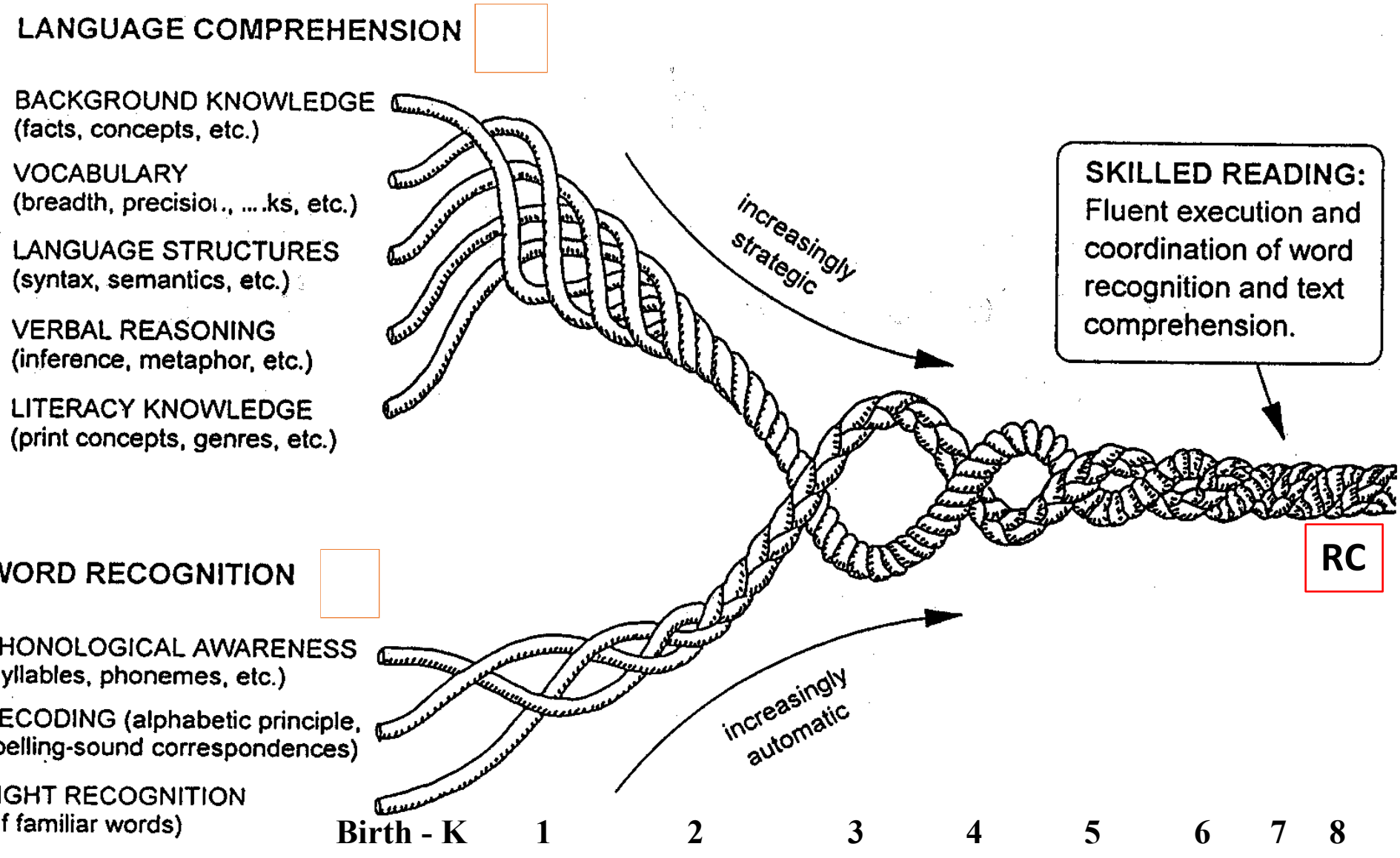
STRANDS OF EARLY LITERACY DEVELOPMENT



Source: Neuman, Susan B. and Dickinson, David K., "Handbook of Early Literacy Research" Adapted from the work of Hollis Scarborough, 2001