Effective intervention for children and adolescents who are struggling readers:
Lessons from Research

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SickKids · UNIVERSITY OF TORONTO

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In 2003, 42% of adult Canadians lacked the literacy skills considered necessary to cope in modern society.

Literacy scores have dropped for young Canadians aged 16-25 whose parents had little education.

Literacy standards and health outcomes

Effective interventions and
better literacy outcomes mean . . .

Improved mental health outcomes for individuals.

Reduced maternal and infant mortality rates and healthier families for societies.

Increased occupational and economic opportunities.

Access to post-secondary education.

Participation in information age.

Reading is all about language on any platform—from books to smartphones

- ❑ Absorbing language by vision . . . language by ear *and by eye.*
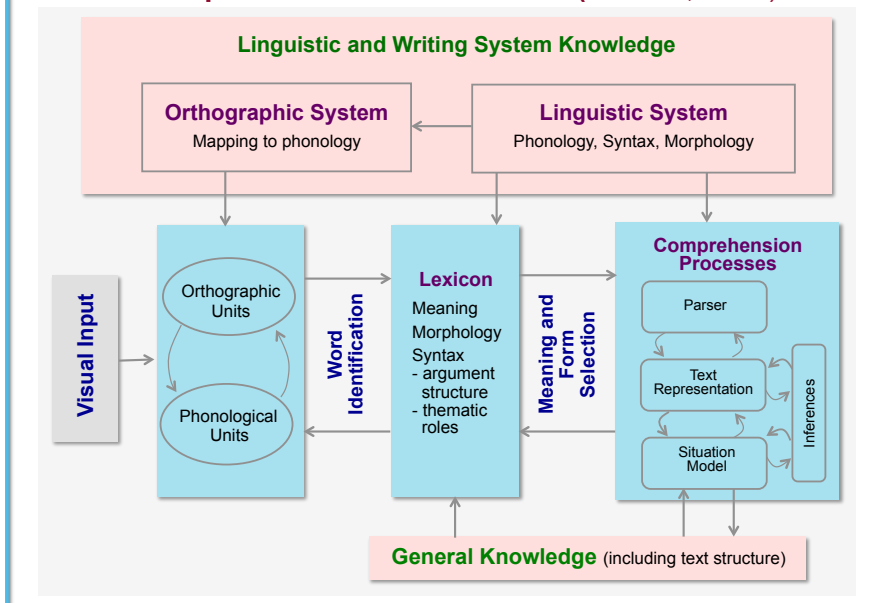- ❑ Reading is parasitic on speech and oral language development.

Building a reading brain takes a long time

Years of hard work are needed before the clockwork-like brain machinery that supports reading runs so smoothly that we forget it exists.
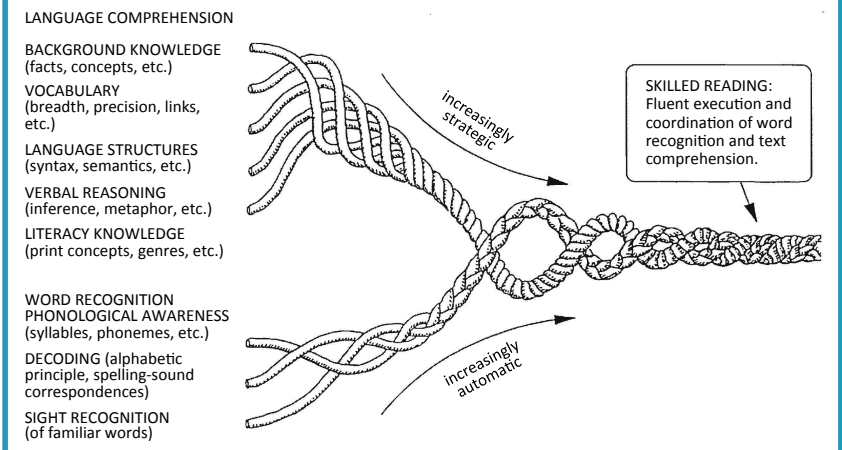
- ❑ Reading is a relatively recent invention dating back only 5000+ years. The alphabet is only 3800 years old—insufficient time for evolution to develop specialized reading circuits in our brains.
- ❑ How does the primate brain that we inherited manage to co-opt and recycle its networks of neurons for reading?
- ❑ Nothing in our evolution equips us to absorb language through vision . . . yet brain imaging with adults shows fixed brain circuitry 'exquisitely attuned' to reading.

—Stanislas Dahaene, *Reading in the Brain*: *The science and evolution of a human invention.* Viking: 2009

A Blueprint of the Skilled Reader (Perfetti, 1999)

Linguistic and Writing System Knowledge

Orthographic System
Mapping to phonology

Linguistic System
Phonology, Syntax, Morphology

Visual Input

Orthographic Units

Phonological Units

Word Identification

Lexicon
Meaning
Morphology
Syntax
- argument structure
- thematic roles

Meaning and Form Selection

Comprehension Processes
Parser
Text Representation
Situation Model
Inferences

General Knowledge (including text structure)

Learning that is multidimensional and a focus that changes over time

LANGUAGE COMPREHENSION

BACKGROUND KNOWLEDGE
(facts, concepts, etc.)

VOCABULARY
(breadth, precision, links, etc.)

LANGUAGE STRUCTURES
(syntax, semantics, etc.)

VERBAL REASONING
(inference, metaphor, etc.)

LITERACY KNOWLEDGE
(print concepts, genres, etc.)

WORD RECOGNITION
PHONOLOGICAL AWARENESS
(syllables, phonemes, etc.)

DECODING (alphabetic principle, spelling-sound correspondences)

SIGHT RECOGNITION
(of familiar words)

increasingly strategic

increasingly automatic

SKILLED READING:
Fluent execution and coordination of word recognition and text comprehension.

Hollis Scarborough (2003)

Why do so many children and youth struggle with learning to read?

Many children come to school with brains, environments, and/or developmental histories that predispose them to reading acquisition problems.
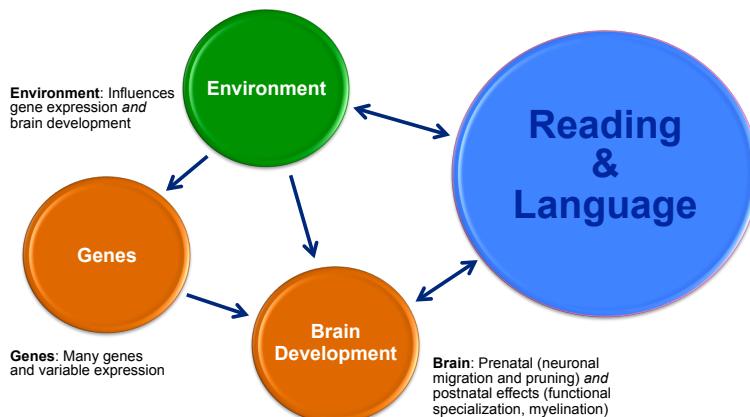
Environment & Developmental Histories

Economic disadvantage plays a powerful role in language development; and language competence is a foundation for later school achievement.

Marked differences in language use in families of differing SES backgrounds (Hart & Risley, 1992, 1995; Walker et al., 1995):

- Three year olds from families on welfare had smaller vocabularies than did 3 year olds in professional families, and they were also adding words more slowly over time.
- Vocabulary use at 3 years predicted language skills and reading comprehension scores at 10 years of age.
- We learned . . . that the problem of skill differences at school entry is bigger and more intractable than we had thought. So much is happening to children during their first three years at home, at a time when they are especially malleable and uniquely dependent on the family for virtually all their experience, that by age 3, an intervention must address not just a lack of knowledge or skill, but an entire general approach to experience (Hart & Risley, *American Educator*, 2003).

The story will be complicated…

Environment: Influences gene expression *and* brain development

Environment

Genes

Genes: Many genes and variable expression

Brain Development

Brain: Prenatal (neuronal migration and pruning) *and* postnatal effects (functional specialization, myelination)

Reading & Language

Neurobiological signatures of skilled readers and of struggling readers

With normal readers . . .

Normal readers develop three major functional networks in the left hemisphere—a highly organized cortical system—that form the neural substrates of skilled reading.

As reading skill increases, brain activation increases in neural subsystems that will support reading.

With disabled readers . . .

These three major networks do *not* develop normally. There is an under-activation of posterior systems in the LH, and an over-reliance on frontal systems in both LH and RH.

Both the development of reading and the development of reading-related brain systems are disrupted.

—(B.A. Shaywitz et al.,1998, 2002; Pugh et al., 2000, 2011)
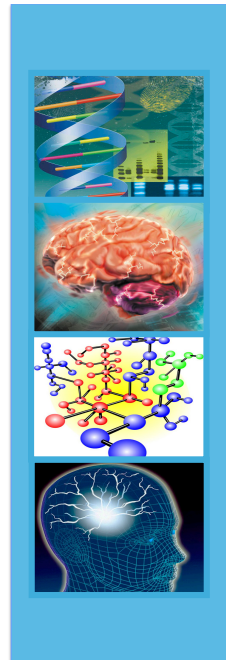
Effective Teaching Impacts the Brain—Education Matters!
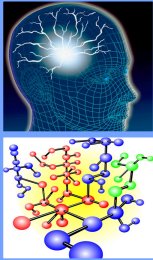
- Effective reading intervention leads to normalization of brain activation profiles and development of neural subsystems both in anterior and posterior brain regions.

- Effective remedial instruction makes the brain activation profiles of children with reading disabilities more like those of able readers.

- Effective teaching for struggling readers can improve reading achievement levels *and* change brain function (fMRI, MEG).

—(B.A. Shaywitz et al., 2004; S.E. Shaywitz et al., 2005; Simos et al., 2002)
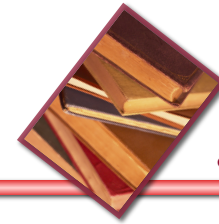
Reading Disabilities
A Model for the Study of LDs and Other Developmental Disorders

Prevalence: High rates.

Genetics: RDs run in families.

Biological correlates: Different patterns of brain activation.

Defining deficits: Word reading accuracy and rate.

Diagnostic profile: Inability to manipulate individual speech sounds in words

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Neurobiological Substrates
The Genetics of Reading Disability

- **Reading ability and reading disability are both familial and heritable.**

- **Family history is one of the most important risk factors:**
  - Parent with RD→ 23-65% risk to the child.
  - Siblings of RD individual 40% risk.
  - Parents of RD individual 27%-49% risk.

    (Pennington & Gilger, 1996; Scarborough, 1998)

Comorbidity is *Very* Common!

Dyslexia
- 15-40% also have ADHD
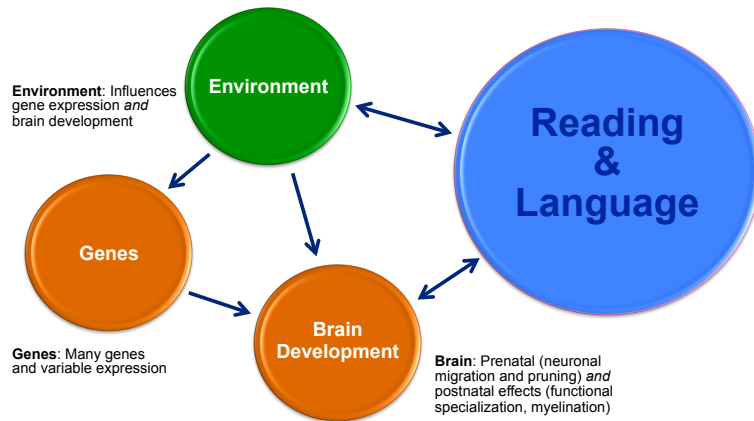- About 50% also have language impairments

ADHD
- 25-40% also have dyslexia
- About 50% also have language impairments

Math Disabilities
- 26% also have ADHD
- 17% also have RD

The story will be complicated…

Environment: Influences gene expression *and* brain development

Environment

Reading & Language

Genes

Genes: Many genes and variable expression

Brain Development

Brain: Prenatal (neuronal migration and pruning) *and* postnatal effects (functional specialization, myelination)

But what *is* effective intervention for struggling readers?

The best approach is. . .
PREVENTION!

Early intervention works!

- We **can** prevent at least 70% of later-identified LDs with systematic early intervention of at-risk children.

- Research studies demonstrate that 70%-90% of at-risk children in Kindergarten-Grade 2 can learn to read at grade level with effective early intervention.

Our Research-Based Interventions:
RD Children Remediated in Grades 1, 2, or 3

empower

PACES
Fluency
Comprehension
Whole Class

- Small group intervention (1:4 ratio; 125 hours of intervention). Random assignment to Treatment or Control.

- Systematic linguistically-informed instruction in reading and text comprehension skills.

- Multiple component remediation: Trained phonological, strategic, semantic, comprehension, and fluency-related skills necessary for reading development (Triple=PHAST +RAVE-O).

NICHD-funded study: Atlanta (R.D. Morris & R.A. Sevcik) Toronto (M.W. Lovett), Boston (M. Wolf)

Proportion of children achieving at expected levels within one year of intervention

| | Woodcock Reading Mastery Test | | | Stand.Rdg Inventory |
	Word Attack	Word Ident.	Pass Comp	RQ
Grade 1	77.6%	76.3%	67.1%	40.3%
Grade 2	50.0%	52.6%	36.8%	24.3%
Grade 3	38.3%	21.3%	34.0%	15.6%

(Lovett, Frijters, Wolf, Steinbach, Sevcik, & Morris, 2013, in preparation)

When reading disabilities are not remediated early...

Early intervention works!

- Universal early screening for academic risk
- Access to effective early intervention
- Teacher preparation and confidence
- Regular progress monitoring
- Access to booster interventions when needed

...the gap between typical and struggling readers widens with every grade

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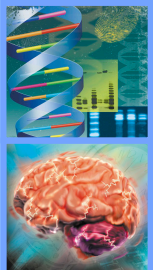# Principle #1

Effective intervention teaches academic skills

Training in motor, visual, neural, or cognitive processes without academic content does *not* lead to better academic outcomes for children with learning disabilities (Fletcher et al., 2007).

Effective Remediation Impacts Brain *and* Behaviour
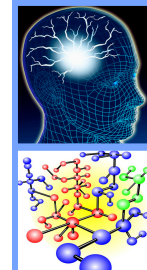
- Good interventions can improve skill levels *and* change brain function (fMRI)
- Good remedial instruction can normalize the brain activation profiles of children with reading disabilities
- Effective phonologically-based remediation can facilitate the development of those neural systems which underlie skilled reading.

(S.E. Shaywitz et al., *Biological Psychiatry*, 2005)

Principle #2

Address the learning deficits directly. Teach necessary skills.

Do not circumvent the problem: Children with auditory processing/letter-sound learning problems need to learn how to decode.

Instruction must be explicit, direct, well-organized and allow cumulative review of previously learned content: >75 studies reviewed by NRP (2000).

Principle #3

Give more instruction.

Increase the amount of instructional time. Children who are struggling readers need ***more***—more time and more intensive instruction to acquire missing skills.

Principle #4

Teach children to be strategic

Struggling readers need to . . .

- Acquire effective reading strategies
- Learn how to apply reading strategies (decoding, comprehension)
- Learn how to monitor and evaluate application of multiple strategies

Principle #5
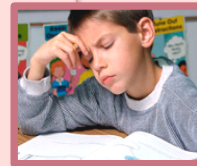
Build adaptive attributions & beliefs

Struggling readers need to…

- Experience success on reading tasks
- Learn how to attribute success/failure adaptively
- Learn how to be flexible and persistent
- Acquire sense of self-efficacy

Issues in the remediation of academic skill deficits

- Understanding normal development of that skill (accuracy, speed, automaticity and consolidation)
- Teaching for transfer
- Teaching children to be strategic

Teach children to be strategic

Struggling readers need to…

- Acquire effective reading strategies
- Learn how to apply reading strategies (decoding, comprehension)
- Learn how to monitor and evaluate application of multiple strategies

Finding effective remediation

for children and adolescents with learning disabilities starts with understanding the core learning deficits…..
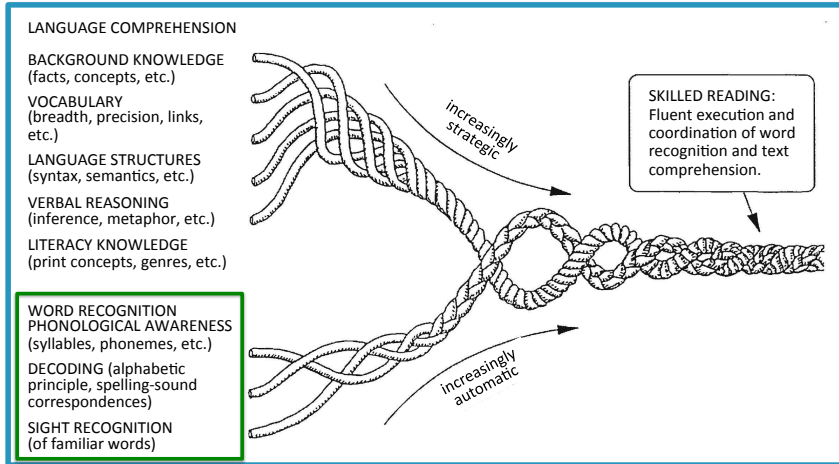
Core Learning Problems

Speech/Language: Inability to manipulate individual speech sounds in words ("phonological awareness"):

What is *dog* without the *d?*	"ob"
What is *tip* without the *t?*	"it"
What is the first sound in *wish?*	"s"
What does *'b-r-i-ck'* say?	"birk"

A 10 year old boy with a Verbal IQ of ~138 and reading at a Grade 1 level

Slide 1

A child with strong language skills and a phonological problem will struggle in learning to read
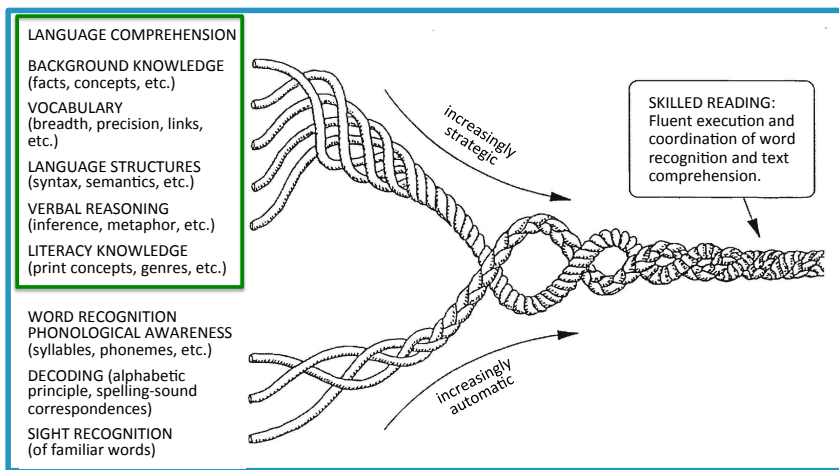
LANGUAGE COMPREHENSION

BACKGROUND KNOWLEDGE
(facts, concepts, etc.)

VOCABULARY
(breadth, precision, links, etc.)

LANGUAGE STRUCTURES
(syntax, semantics, etc.)

VERBAL REASONING
(inference, metaphor, etc.)

LITERACY KNOWLEDGE
(print concepts, genres, etc.)

WORD RECOGNITION
PHONOLOGICAL AWARENESS
(syllables, phonemes, etc.)

DECODING (alphabetic principle, spelling-sound correspondences)

SIGHT RECOGNITION
(of familiar words)

increasingly strategic

increasingly automatic

SKILLED READING:
Fluent execution and coordination of word recognition and text comprehension.

Hollis Scarborough (2003)

Slide 2

Core Learning Problems
(Speech/Language)

- ❑ Poor discrimination of speech sounds.
  (*"Did you see the Seven Wharfs?"*)

- ❑ Difficulty attending to or remembering language spoken rapidly.

- ❑ Trouble finding the right word.
  (*"Eskimo cabin"* for *igloo; "an imagination horse"* for *unicorn*)

- ❑ Problems learning correct grammatical forms.
  (*"A apple and a peach—you both eat them."*)

Slide 3

A child with strong word reading but poor language or poor strategy use will struggle with comprehension

LANGUAGE COMPREHENSION

BACKGROUND KNOWLEDGE
(facts, concepts, etc.)

VOCABULARY
(breadth, precision, links, etc.)

LANGUAGE STRUCTURES
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Hollis Scarborough (2003)

Slide 4

Core Learning Problems

- ❑ **Ineffective strategies for new learning**
  - ❑ Does not use what s/he *does* know
  - ❑ Does not 'chunk' word/problem into smaller parts
  - ❑ Does not have good "learning-to-learn" strategies

- ❑ **Failure to attribute success and failure to own efforts**

Beliefs and Attitudes:
Emotional Moderators

- Attributions about success/failure
- Beliefs about effort and achievement
- Self-efficacy beliefs affect self-regulation, motivation, and affective state

Motivational Profiles of Students with RD
Work by Jan C. Frijters

Samples
- Students Gr 6-8 with RD (N=68)
- Students Gr 6-8 without RD (N=127)

Intrinsic Motivation Inventory—Reading
- RD youth were less interested in reading and saw themselves as less competent readers

Sydney Attributional Scale—Reading
- RD youth more likely to attribute failure to ability and success to external factors

The Hospital for Sick Children's
LEARNING DISABILITIES RESEARCH PROGRAM

Developing methods of remediating language learning problems in children and evaluating them in controlled research designs . . .

(>6500 children and adolescents with severe reading disabilities seen in our laboratory classrooms . . .)

Multiple Component Programs Produced Better Decoding Outcomes

- **Explicit strategy instruction**
  - Children taught to use multiple decoding strategies
  - Dialogue structures taught
- **Knowledge about language structure**
  - Children trained explicitly to use different levels of subsyllabic segmentation
  - Children learned about spelling patterns and morphology
- **All core deficits remediated directly**
  - Phonological and strategy learning deficits addressed
  - Specific attributional retraining part of program

Multiple Component Programs Produced Better Comprehension Outcomes

- ❏ **Explicit strategy instruction**
  - ❏ Students taught to use multiple comprehension strategies
  - ❏ Dialogue structures taught
- ❏ **Knowledge about language and text structure**
  - ❏ Students trained explicitly to recognize different text structures and clues to author's purpose
  - ❏ Students learned about signal words, paragraph structures, referential cohesion in text
- ❏ **All core deficits remediated directly**
  - ❏ Vocabulary and comprehension deficits addressed
  - ❏ Motivation for active reading, selection of texts

SickKids

LDRP Reading Programs
Roll-Out

Laboratory Classroom	Community Translation Research	Commercial Development & Availability
PHAST PACES Fluency Comprehension Whole Class	**PHAST** PACES Fluency Comprehension Whole Class	**empower** READING
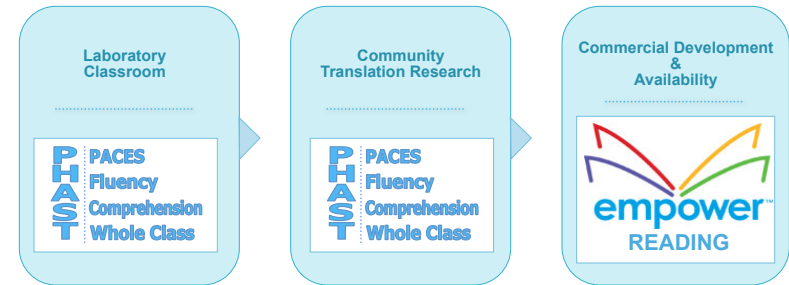
PHAST Reading Programs are the research versions of Empower™ Reading

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empower™

𝒜 program framework to help all children learn to read regardless of history and disability . . .

PHAST Reading Programs (research versions)

Apprenticeship Model

- ❏ **Modelling:** Students are apprentices to an expert reader (initially the teacher, later students take turns as expert).
- ❏ **Scaffolded instruction:** framework of integrated foundational skills and strategies taught.
- ❏ **Dialogue structure** for learning: seeds for later self-talk.
- ❏ Explicit teaching of **prerequisite skills** for successful strategy use.
- ❏ Explicit teaching of **self-monitoring and evaluation.**

Empower™ Decoding Lessons

1. Acquiring prerequisite skills:
   - Acquisition of letter sounds
   - 120 Keywords
   - Vowel and variant vowel pronunciations
   - Affixes

2. Training on the five decoding strategies.

3. Strategy practice on difficult words using a reciprocal teaching model.

4. Application of strategies during text reading.

Empower™ Word Identification Strategies

- **Sounding Out:** strand → *str + aaaa + nnn + d*

- **Rhyming:** limerick → *(him)(her)(kick)*

- **Peeling Off:** unrelenting → *(un)(re)lent(ing)*

- **Vowel Alert:** h<u>ea</u>d   b<u>ea</u>d   br<u>ea</u>k
  seam?   great?   breath?

- **SPY:** sailboat → *sail + boat*

Sounding Out Strategy Dialogue

First, I'll <u>Know the Sounds</u>

Next, I'll <u>Blend the Sounds</u>
(slowly without stopping)

Last, I'll <u>Read the Word</u>!

man

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a	e	i	o	u
grab	he	hi	go	club
place	speak	nice	boat	luck
pack	scream	kick	job	glue
dad	ear	did	rock	bug
made	eat	slide	dog	jump
rag	red	wife	oil	drum
page	see	pig	broke	fun
nail	need	right	fold	skunk
rain	queen	like	on	up
take	keep	file	long	bus
talk	sweet	will	phone	use
all	tell	him	zoo	nut
am	them	time	food	
name	ten	in	good	
champ	end	find	look	
man	tent	vine	fool	**y**
and	her	king	cop	
nap	test	sink	for	cry
car	yes	ship	more	baby
shark	let	squirt	corn	gym
smart	flew	this	nose	
has		wish	not	
smash		it	could	
mask		white	round	
cat		dive	out	
ate		give	cow	
gave			glow	
paw			down	
pay			boy	

From "Putting struggling readers on the PHAST track: A program to integrate phonological and strategy-based remedial reading instruction and maximize outcomes" by Lovett, M.W., Lacerenza, L., & Borden, S.L., 2000, *Journal of Learning Disabilities, 33,* 458-476. Copyright 2000 by PRO-ED, Inc. Reprinted with permission.

FIGURE 4. The PHAST Keyword Bank: A physical organization of keyword spelling patterns by vowel and rime units. (From the Benchmark School Word Identification/Vocabulary Development Program by Gaskins, Downer, & Gaskins, 1986, Media, PA: Benchmark School. Copyright 1986 by Benchmark School. Adapted with permission.)

The Rhyming Door
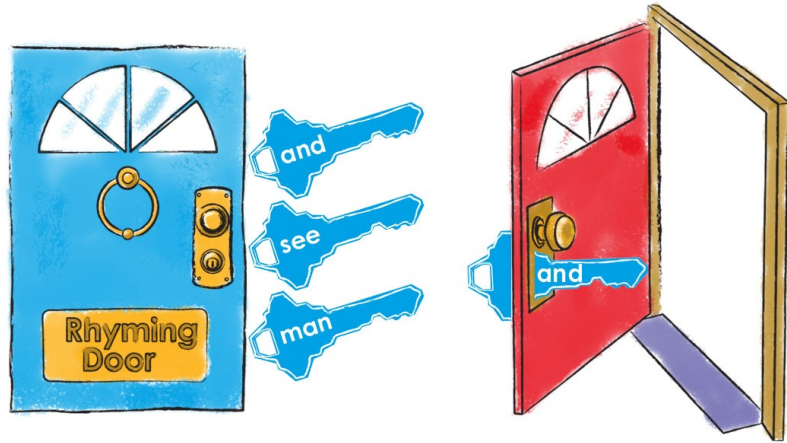
Rhyming Door

and
see
man
and

brand
and

thermostatic
her   go   cat kick

The Peeling Off Tree

un   ing
mis   less
re   able
pre   tion
de   est

uninhabitable

grab it

That's a *progressive* idea.

publisher	thermostat
brand	hydrogen
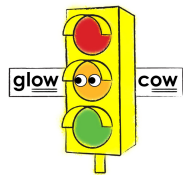
Vowel Alert

glow cow

Single Vowels

at	**a**	ate
end	**e**	he
it	**i**	hi
on	**o**	go
up	**u**	use
cry	**y**	baby/gym

Vowel Pairs

bead	**ea**	head/great
glow	**ow**	cow
zoo	**oo**	look
pie	**ie**	chief

C-Alert

cat/nice

G-Alert

go/gym

---

leathery

bead
head
great

The *raincoat* is red.

speed|boat	cat|fish
thunder|struck	flag|ship
foot|ball	wild|cat

The Game Plan

Choose · Use · Check · Score

Sample Dialogue
(unplowed)

I'm going to use Game Plan to read this word. I see beginnings and endings and a double trouble twin, so I'll use Peeling Off and Vowel Alert to figure out this word. First I'll use Peeling Off. I Peel Off *un* from the beginning and *ed* from the end. Now I'll use Vowel Alert on the double trouble twin *ow*. First, I'll try *ow* as in *glow* and then, I'll try *ow* as in *cow* and see what gives me a real word. First, I'll try *ow* as in *glow*. I sound out the word and see if it makes a word I know: *plllooo*. Now, I'll put the word together: *unpload*. It doesn't make a real word, but I don't give up. Now, I'll try *ow* as in *cow*: *plllowowow*. Now I'll put the word together again: *unplowed*. Yes, that's a real word! I used Peeling Off and Vowel Alert and it worked! I was flexible, I stuck at it, and I got the word!

Improvement in reading comprehension skills
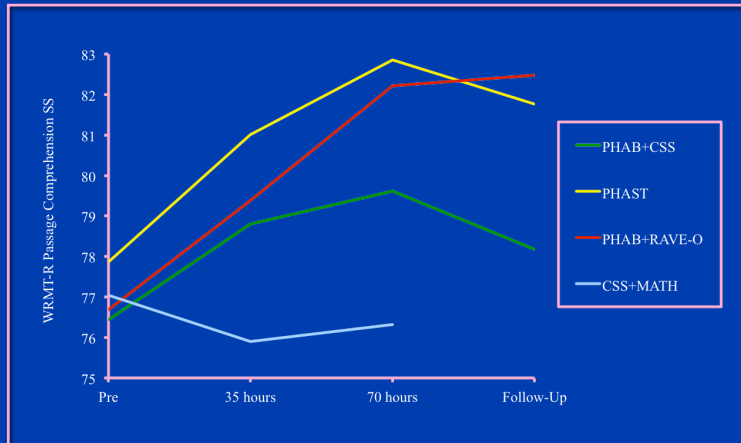
Morris, Lovett, Wolf et al., *Journal of Learning Disabilities*, 2012

Are these programs equally effective for students of differing SES, IQ, and language backgrounds?

Do program benefits extend to disadvantaged students? To lower-IQ students? To English language learners?

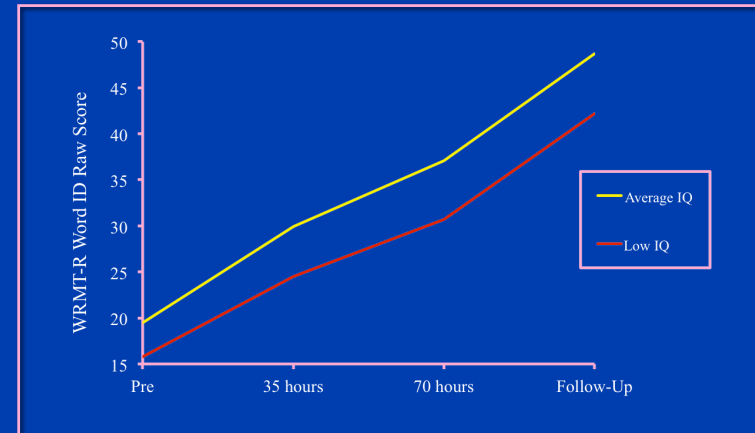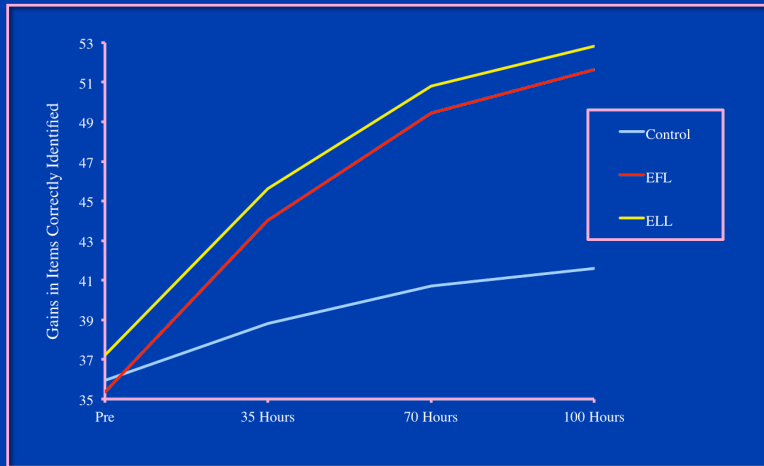Did children of different SES levels make equivalent gains?
(N=211; No control group)
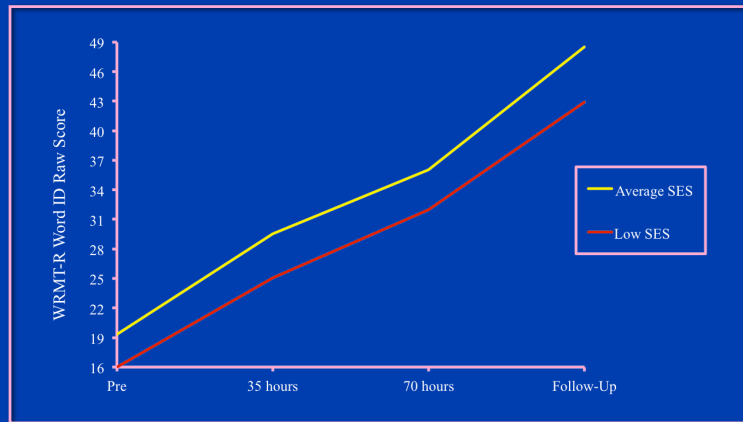
Morris, Lovett, Wolf et al., *Journal of Learning Disabilities*, 2012

Did children of different IQ levels make equivalent gains?
(N=211; No control group)

Morris, Lovett, Wolf et al., *Journal of Learning Disabilities*, 2012

Slide 1

Do children of different language backgrounds make equivalent gains?

Line graph — Gains in Items Correctly Identified (y-axis, 35 to 53) vs. Pre, 35 Hours, 70 Hours, 100 Hours (x-axis). Legend: Control, EFL, ELL.

Lovett, et al., *Journal of Learning Disabilities*, 2008

Slide 2

Did the same teachers produce different results using our research-based reading programs (vs. special education control program)?

Bar graph — Word Attack Standard Score Gains (y-axis, 0 to 14) at 35 hours, 70 hours, Posttest. Legend: Reading program, Curricular control.

Slide 3

empower™

Partnerships to help children and adolescents struggling to learn to read

2006-2013

SickKids®

Participating Schools/ School Boards

- Toronto Catholic District School Board
- Waterloo Region District School Board
- Dufferin-Peel Catholic District School Board
- Hamilton-Wentworth District School Board
- Peel District School Board
- Peterborough Victoria Northumberland & Clarington Catholic District School Board
- Provincial Schools Branch: Demonstration Schools
- Northeastern Catholic District School Board
- Waterloo Catholic District School Board
- Ottawa-Carleton District School Board
- Toronto District School Board
- Thunder Bay Catholic District School Board
- Near North District School Board

- District School Board of Niagara
- Institute of Child Study, University of Toronto
- Algonquin-Lakeshore Catholic District School Board
- Vancouver School Board, British Columbia
- Brandon School Division, Manitoba
- Avon Maitland District School Board
- Suzuki Charter School (Edmonton)
- Kol Koreh Literacy Project
- Upper Canada District School Board
- Hastings and Prince Edward District School Board
- Montcrest School
- Olive Grove School
- Thames Valley School Board
- Halton Catholic District School Board
- Hamilton-Wentworth Catholic District School Board

Since 2006: >900 teachers trained in, and >8500 students received Empower™ Reading

Slide 4

Independent School Board Evaluations
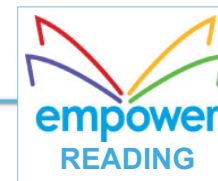
empower™
READING

- Hamilton Wentworth District School Board
- Waterloo Region District School Board
- Toronto Catholic District School Board
- Vancouver School Board

Empower™ Reading
Hamilton Wentworth DSB: Gains in Reading
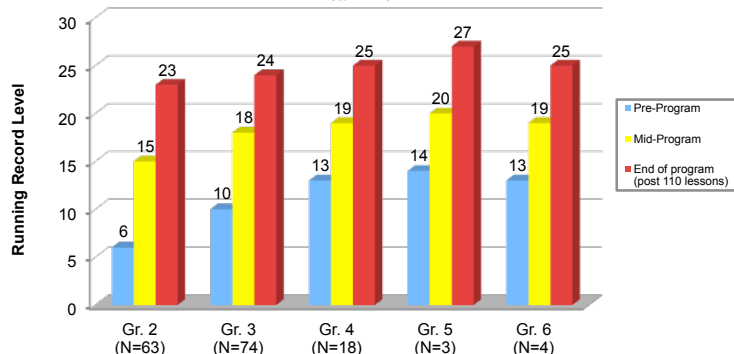(students in Grades 2 to 5)
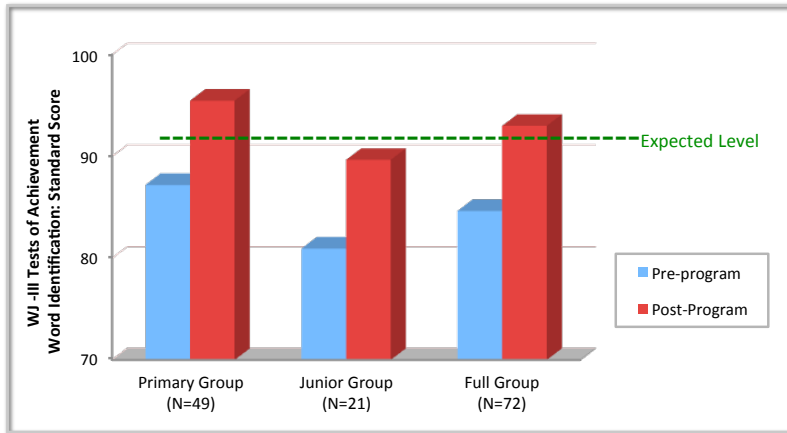
Students overall had average reading skills (SS≥90) after Empower™ Reading

Data independently collected by HWDSB; presented by SickKids with permission
Empower™ © The Hospital for Sick Children 2006

Empower™ Reading
Hamilton-Wentworth DSB: Gains in Reading Skills
(students in Gr. 2) N=249
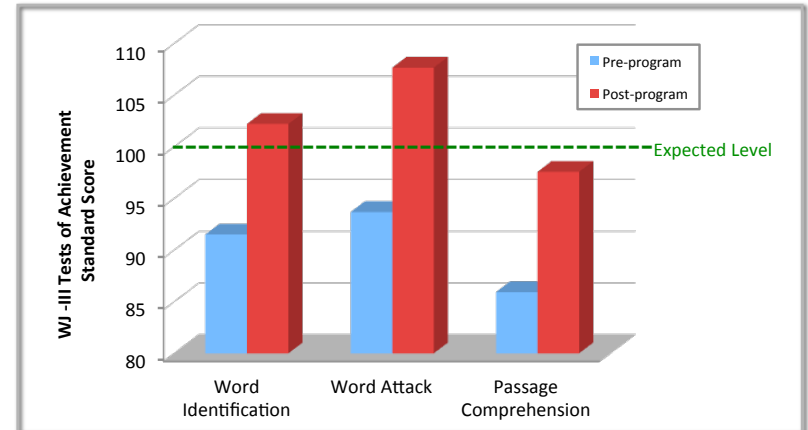
Students overall had average reading skills (SS≥90) after Empower™ Reading

Data independently collected by HWDSB; presented by SickKids with permission
Empower™ © The Hospital for Sick Children 2006

Empower™ Reading
Decoding and Spelling

Waterloo Region District School Board: 2008-09 Results
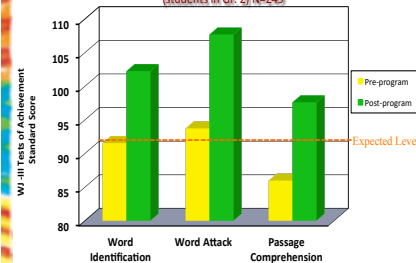**Averages of Running Record Progress**
Total N = 162

Grade Level Board Targets
Gr.1: 15-17; Gr. 2: 20-22; Gr. 3: 24-26; Gr. 4: 24-30

Data independently collected by WRDSB; presented by SickKids with permission
Empower™ © The Hospital for Sick Children 2006

"Studies of outcomes for students placed in special education show flat levels of growth and little evidence that typical interventions close the achievement gap."
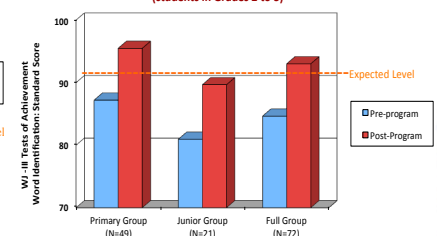
Fletcher & Vaughn, 2009 citing the work of Bentum & Aaron, 2003; Donovan & Cross, 2002; Glass, 1983; Hanushek, Kain, & Rivkin, 1998; Torgesen et al., 2001; Vaughn, Levy, Coleman, & Bos, 2002

Empower™ © The Hospital for Sick Children 2006

Slide 1 (top-left):

© Randy Glasbergen / glasbergen.com

QUIZ TODAY!

GLASBERGEN

"Once I learn how to use Google, isn't that all the education I really need?"

Slide 2 (top-right):
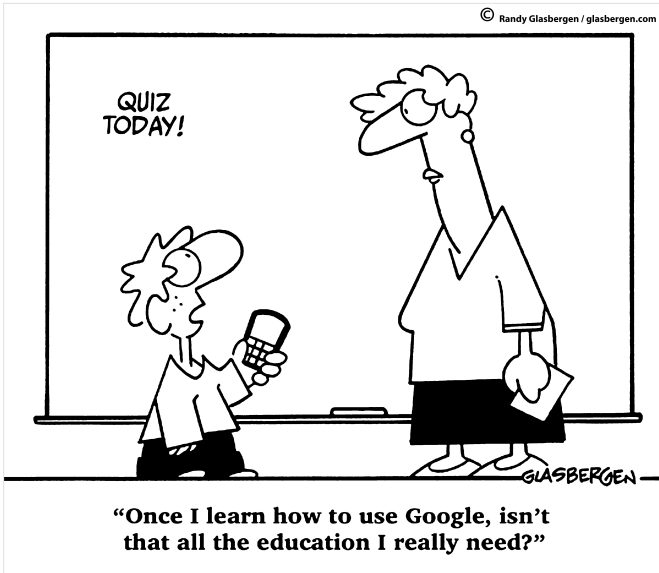
Is it ever too late to work on basic literacy skills?
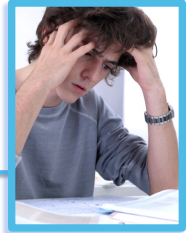
Does it make sense to intervene if a student still cannot read in high school and beyond?

. . . and if so, how do you go about it?

Slide 3 (bottom-left):

The Common Core State Standards and High School

"The Standards set grade-specific standards but do *not* define the intervention methods or materials necessary to support students who are well below… grade-level expectations" (CCSS Introduction, p.6).

Comments from one special education teacher in high school:

- *At my high school, concerns about CCSS emanate from the reality that many of our first year students enter performing below grade level . . . With implementation of the CCSS, I believe that success in high school is now especially reliant on students meeting academic benchmarks in earlier grades.*

- *How can teachers address a freshman student with skill deficits? Do we hold them back? Pass them along and hope for a miracle?*

- *At my high school, students who lack understanding in literacy and math become overwhelmed, flat line or drop out; transition program might help prevent this.*

COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

Slide 4 (bottom-right):

The struggling adolescent reader

- Poor academic performance in several areas

- Problems reading for information, taking notes, report writing

- Low self-esteem; misguided beliefs about effort and achievement

- Not well equipped to meet the following standard:

Determine the point of view of John Adams in his 'Letter on Thomas Jefferson" and analyze how he distinguishes his approach from an alternative approach articulated by Thomas Jefferson.

[RI.7.6: Literary Nonfiction "Letter on Thomas Jefferson" by John Adams (1776), listed for grades 6 to 8 (page 58)]

Special Considerations in Working with Older Students

- ❑ Students need to 'buy into' the process
- ❑ Students should have reading goals
- ❑ Progress must be tangible and celebrated

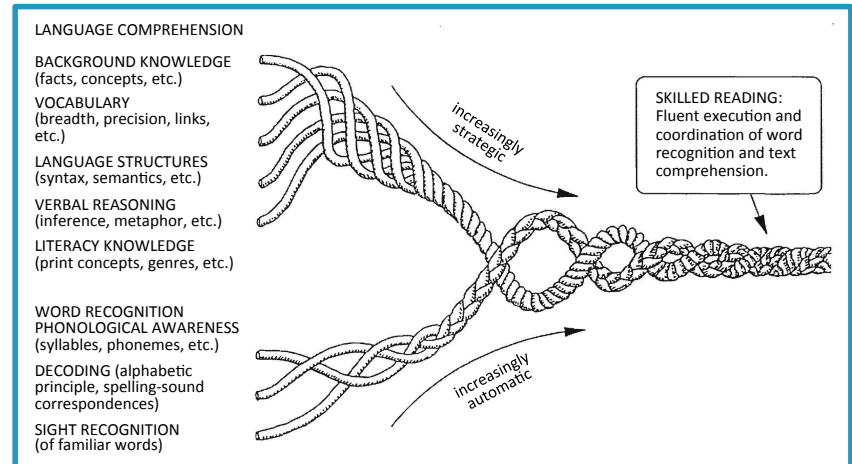## Special Considerations in Working with Older Students

- ❑ Form small groups of students at similar levels of reading skill
- ❑ Reading remediation earns academic credits
- ❑ Acquiring the skills necessary for content-area learning

Which remedial approaches produced the best outcomes?

- ❑ **Explicit strategy instruction**
  - ❑ Children taught to use multiple decoding and reading comprehension strategies
  - ❑ Dialogue structures taught for strategy application and self-monitoring
  - ❑ Prerequisite skills taught to ensure strategy success

- ❑ **Knowledge about language and text structure**
  - ❑ Children trained explicitly to use different levels of subsyllabic segmentation in decoding words
  - ❑ Children learned about spelling patterns and morphology
  - ❑ Children learned about different text structures

- ❑ **Core deficits remediated directly (including motivational)**
  - ❑ Phonological, language, and strategy learning deficits addressed
  - ❑ Specific attributional retraining and motivational focus to instruction

Learning that is multidimensional and a focus that changes over time

LANGUAGE COMPREHENSION

BACKGROUND KNOWLEDGE (facts, concepts, etc.)

VOCABULARY (breadth, precision, links, etc.)

LANGUAGE STRUCTURES (syntax, semantics, etc.)

VERBAL REASONING (inference, metaphor, etc.)

LITERACY KNOWLEDGE (print concepts, genres, etc.)

WORD RECOGNITION
PHONOLOGICAL AWARENESS (syllables, phonemes, etc.)

DECODING (alphabetic principle, spelling-sound correspondences)

SIGHT RECOGNITION (of familiar words)

increasingly strategic

increasingly automatic

SKILLED READING: Fluent execution and coordination of word recognition and text comprehension.

Hollis Scarborough (2003)

Empower™ Reading High School
A Secondary School Literacy Program

Designed to specifically address
literacy learning problems in adolescents

To date, more than 3000 students have
been seen in high schools across Ontario

Learning Disabilities Research Program, The Hospital for Sick Children
PHAST PACES is the research version of Empower™ Reading High School
Empower™ © The Hospital for Sick Children 2006

PHAST PACES/Empower™ High School
An intervention for struggling readers in high school
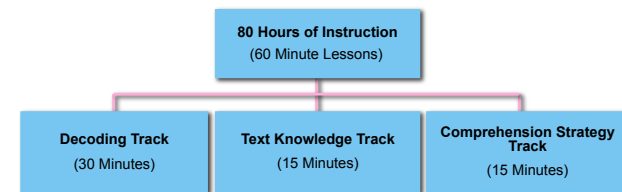
(Lovett, Lacerenza, De Palma, & Frijters, *JLD*, 2012)

Empower™ © The Hospital for Sick Children 2006

Apprenticeship Model

- **Modelling:** Students are apprentices to an expert reader (initially the teacher, later students take turns as expert)

- **Scaffolded instruction:** framework of integrated foundational skills and strategies taught

- **Dialogue structure** for learning: seeds for later self-talk

- Explicit teaching of **prerequisite skills** for successful strategy use

- Explicit teaching of **self-monitoring and evaluation**
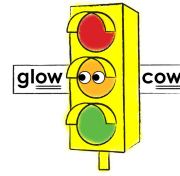

The Peeling Off Tree

Empower™ © The Hospital for Sick Children 2006

Panel 1 (top-left)

un in hábi̇t̀able

grab   it

Panel 2 (top-right)

glow | cow

Vowel Alert

Single Vowels		
at	**a**	ate
end	**e**	he
it	**i**	hi
on	**o**	go
up	**u**	use
cry	**y**	baby/gym

Vowel Pairs		
bead	**ea**	head/great
glow	**ow**	cow
zoo	**oo**	look
pie	**ie**	chief

C-Alert	G-Alert
cat/nice	go/gym

## Panel 3 (bottom-left)

leathery

bead
head
great

Panel 4 (bottom-right)

Sample Dialogue
(unplowed)

I'm going to use Game Plan to read this word. I see beginnings and endings and a double trouble twin, so I'll use Peeling Off and Vowel Alert to figure out this word. First I'll use Peeling Off. I Peel Off *un* from the beginning and *ed* from the end. Now I'll use Vowel Alert on the double trouble twin *ow*. First, I'll try *ow* as in *glow* and then, I'll try *ow* as in *cow* and see what gives me a real word. First, I'll try *ow* as in *glow*. I sound out the word and see if it makes a word I know: *plllooo*. Now, I'll put the word together: *unpload*. It doesn't make a real word, but I don't give up. Now, I'll try *ow* as in *cow*: *plllowowow*. Now I'll put the word together again: *unplowed*. Yes, that's a real word! I used Peeling Off and Vowel Alert and it worked! I was flexible, I stuck at it, and I got the word!

The Game Plan

Choose · Use · Check · Score
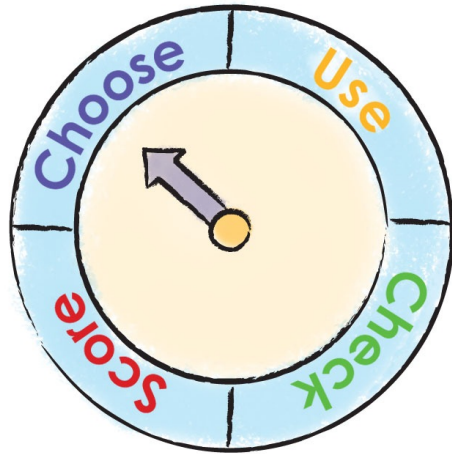
Empower™ © The Hospital for Sick Children 2006

Build adaptive attributions and motivation for reading

Struggling readers need to . . .

- Experience success on reading tasks
- Learn how to attribute success/failure adaptively
- Learn how to be flexible and persistent
- Acquire sense of self-efficacy

Middle School Intervention Study
(Lovett, Morris, Sevcik, & Frijters, 2006-2011)

- Random assignment of small instructional groups to:
  - PHAST Comprehension or PHAST Fluency or
  - Special Education Control Condition
- Participants from Grades 6-8
- All confirmed to meet criteria for RD
- All received 125 hours of small group remediation

## Are the PHAST interventions effective at increasing reading skills in middle school?
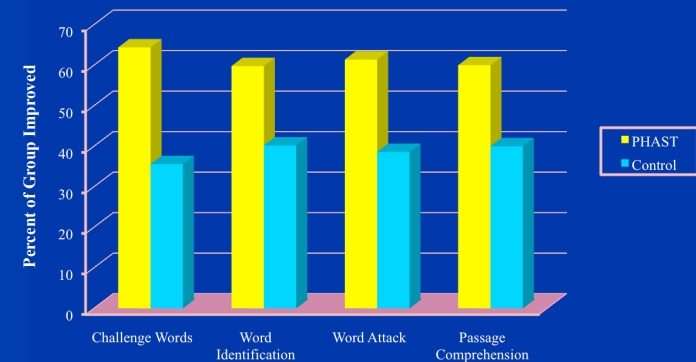
Lovett, Morris, Sevcik, & Frijters, in progress

**What about students'
beliefs and attitudes about learning?**

**Do program benefits extend
beyond reading growth to affect
the motivational profiles
of struggling readers?**

**Change in attributions from learned helplessness
to mastery orientation with PHAST interventions**
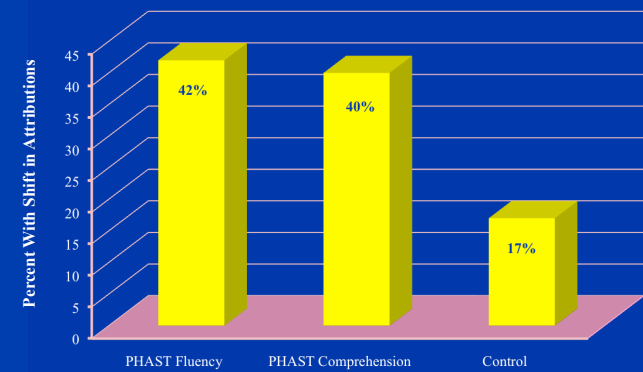
Frijters, Dodsworth, Lovett, Sevcik, & Morris, 2009; Frijters et al, in preparation

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**Improved comprehension depended on
adaptive changes in attributional profile**
(PHAST Middle School)
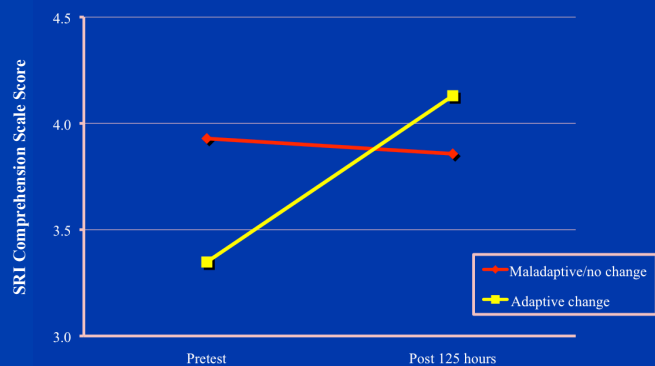
Frijters, Dodsworth, Lovett, Sevcik, & Morris, 2009; Frijters et al, in preparation

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**PHAST PACES/Empower™ High School
An intervention for struggling readers
in high school**

80 Hours of Instruction
(60 Minute Lessons)

| Decoding Track (30 Minutes) | Text Knowledge Track (15 Minutes) | Comprehension Strategy Track (15 Minutes) |

(Lovett, Lacerenza, De Palma, & Frijters, *JLD*, 2012)

Empower™ © The Hospital for Sick Children 2006
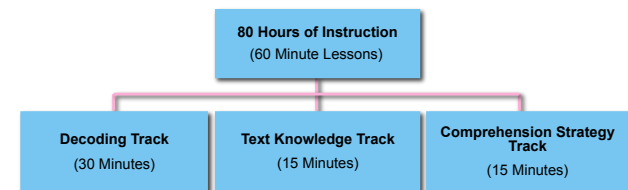
Challenge Words — Ecosystems

Challenge Words	Ecosystems
investigations	researchers
microecosystem	photosynthesis
autotroph	metabolism
ecological niche	thermodynamics

Challenge Words — Automotive

Challenge Words	Automotive
radiator	accelerator
cylinder	ignition
torque steer	methanol
hydraulic valve	fulcrum

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empower

PACES
Comprehension Strategies

Predicting — *What do I predict this story is about? What do I predict I will learn?*

Activating — *What do I already know?*

Clarifying — *If I am confused, I go back and reread the sentence(s).*

Evaluating Through Questioning — Fiction: 4W, 3W, 1H   Non-Fiction: 3W2+

Summarizing — Tell the important events of the story using: Fiction: 4W + 3W + 1H   Nonfiction: 3W2+

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PHAST PACES/ Empower™ High School
Text Knowledge Track

Text Fluency
Coherence ■ Unity ■ Completeness

Text Structure (Macro)
■ Narrative   ■ Expository
Idea mapping
Organizational structures
Elements of a paragraph
Elements of plot

Text Structure (Micro)
Signalling devices
Anaphora
Ellipses

METACOGNITIVE STRATEGIES

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PHAST PACES/Empower™ High School
Comprehension Strategy Track

FLEXIBLE ■ SELF-GUIDED ■ MULTI-STRATEGIC

■ **Elaborations** (Application, interpretation)
■ **Text to self** ■ **Text to text** ■ **Text to world**

Summarizing

Evaluation through Questioning

Clarifying

Activating Prior Knowledge

Predicting

METACOGNITIVE STRATEGIES

METACOGNITIVE STRATEGIES

Empower™ © The Hospital for Sick Children 2006
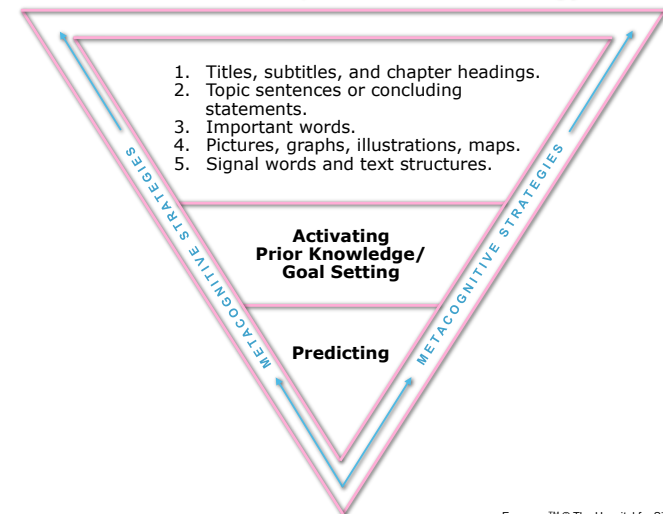

Active Readers Interact with Text

- Actively use comprehension strategies
- Make connections to what they know
- Explore word meanings
- Identify important ideas or events in a text
- Stop and clarify when confused
- Monitor and evaluate their comprehension
- Read for information and/or enjoyment

Léa Lacerenza, Learning Disabilities Research Program, The Hospital for Sick Children 2012
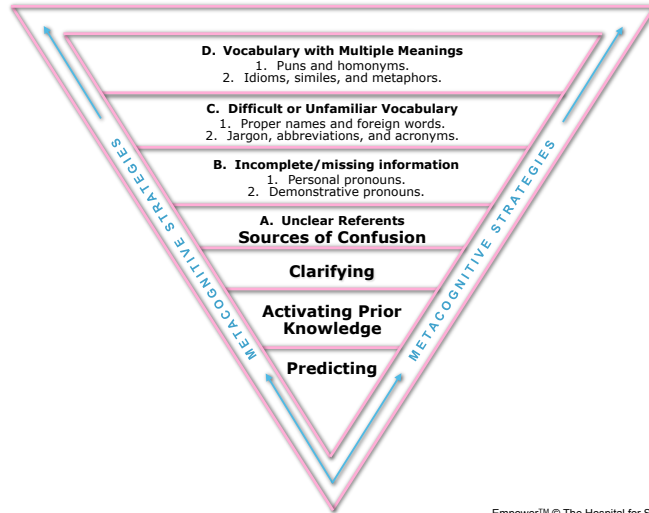

Preskills for Comprehension Strategy Use

- Text Signals—titles, capitals, bolding, underlining, punctuation
- Parts of speech (nouns, adjectives, pronouns, verbs, adverbs)
- Vocabulary—Multiple Meaning Words
- Sentences, Paragraphs
- Fiction/ Non-fiction

PHAST PACES/Empower™ High School
Text Structure & Comprehension Strategy Tracks

1. Titles, subtitles, and chapter headings.
2. Topic sentences or concluding statements.
3. Important words.
4. Pictures, graphs, illustrations, maps.
5. Signal words and text structures.

Activating Prior Knowledge/ Goal Setting

Predicting

METACOGNITIVE STRATEGIES

METACOGNITIVE STRATEGIES

Empower™ © The Hospital for Sick Children 2006

Slide 1

PHAST PACES/Empower™ High School
Text Structure & Comprehension Strategy Tracks

METACOGNITIVE STRATEGIES

METACOGNITIVE STRATEGIES

D. Vocabulary with Multiple Meanings
1. Puns and homonyms.
2. Idioms, similes, and metaphors.

C. Difficult or Unfamiliar Vocabulary
1. Proper names and foreign words.
2. Jargon, abbreviations, and acronyms.

B. Incomplete/missing information
1. Personal pronouns.
2. Demonstrative pronouns.

A. Unclear Referents
Sources of Confusion

Clarifying

Activating Prior Knowledge

Predicting

Empower™ © The Hospital for Sick Children 2006

Slide 2

Clarifying

Active Readers STOP and CLARIFY when understanding has broken down. They go back and reread the sentence(s).

Sources of Confusion

❑ Unclear referents (pronouns) (s/he, it, those . . .)

❑ Incomplete or missing information (One sprinter beat his personal time while others did not.)

❑ Difficult or unfamiliar vocabulary (minutia, alloys, terraqueous)

❑ Words with multiple meanings, spellings (scale, bluff; way/weigh/whey)

Personal Pronouns
I, me, you, your(s),
he, him, his,
she, her(s), it(s)
we, us, our(s),
they, them, their(s)

– · – · – · – · –

Demonstrative Pronouns
this, that
these, those

Slide 3

Clarifying
Words with Multiple Meanings

What is clarifying?
When do you clarify?
Why do you clarify?
How do you clarify?

– · – · – · – · – · –

Carefully read the sentences below. Identify the source of confusion and explain why it might be confusing.

1. Christine stole the spotlight.
   _____

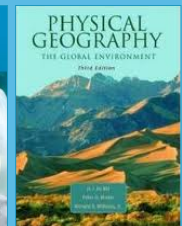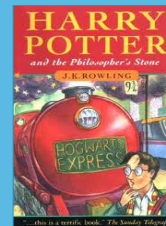2. The dead leaves are varnished with colour like blood.
   _____

3. We had a long song and dance about the rules.
   _____

Slide 4

Active Readers MONITOR and EVALUATE their understanding of text by asking themselves questions.
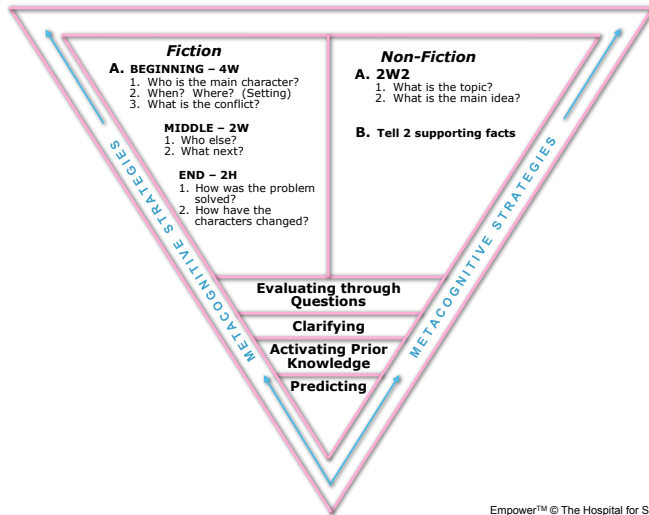
Understand the author's plan by knowing how texts are structured
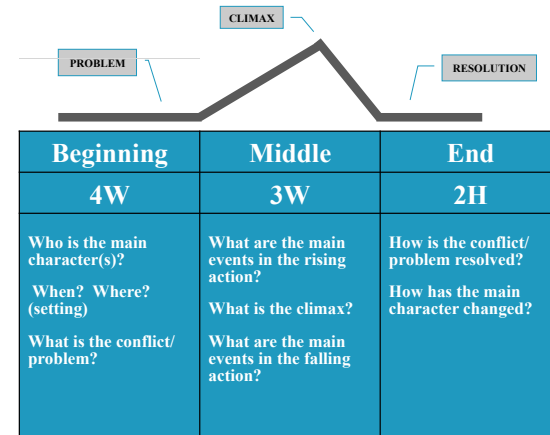
Narrative Text Structures

Expository Text Structures

Slide 1

PHAST PACES/Empower™ High School
Text Structure & Comprehension Strategy Tracks

Fiction

A. BEGINNING – 4W
1. Who is the main character?
2. When? Where? (Setting)
3. What is the conflict?

MIDDLE – 2W
1. Who else?
2. What next?

END – 2H
1. How was the problem solved?
2. How have the characters changed?

Non-Fiction

A. 2W2
1. What is the topic?
2. What is the main idea?

B. Tell 2 supporting facts

METACOGNITIVE STRATEGIES

METACOGNITIVE STRATEGIES

Evaluating through Questions

Clarifying

Activating Prior Knowledge

Predicting

Empower™ © The Hospital for Sick Children 2006

Slide 2

EVALUATING THROUGH QUESTIONS
Narrative Texts—The Plot Graph

CLIMAX

PROBLEM

RESOLUTION

Beginning	Middle	End
4W	**3W**	**2H**
Who is the main character(s)? When? Where? (setting) What is the conflict/ problem?	What are the main events in the rising action? What is the climax? What are the main events in the falling action?	How is the conflict/ problem resolved? How has the main character changed?

Slide 3

Narrative Summary = 4W+3W+2H

Beginning 4W	Middle 3W	End 2H
Who is the main character(s)? When? Where? (setting) What is the conflict/problem?	What are the main events in the rising action? What is the climax? What are the main events in the falling action?	How is the conflict/ problem resolved? How has the main character changed?

Title: _____

_____
_____
_____
_____
_____
_____
_____
_____

Slide 4

EVALUATING THROUGH QUESTIONS
Expository Texts

Understand the author's plan.

- ❑ Text Structures & Signal Words
- ❑ Main Idea & Supporting Statements
- ❑ Ask yourself: 3W2+
  - ❑ What is the topic?   What is the main idea?
  - ❑ What information supports the main idea? Tell 2 or more.

The better you understand, the more you will remember.

EVALUATING THROUGH QUESTIONS
Expository Texts

Common text structures & signal words.

- ❑ Statement & Explanation/Problem & Solution
- ❑ Sequence (Chronological, Spatial, Order of Importance)
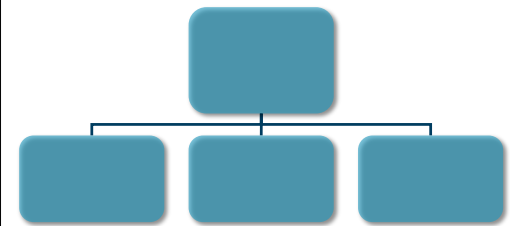- ❑ Description
- ❑ Compare & Contrast
- ❑ Cause & Effect

**If you spot the signal words,
you will identify the text structure.**

EVALUATING THROUGH QUESTIONS
Expository Texts

Signal Words
- ❑ for example
- ❑ for instance
- ❑ to illustrate
- ❑ in other words
- ❑ thus
- ❑ in addition/also
- ❑ embedded questions

Map for Statement/Explanation

EVALUATING THROUGH QUESTIONS
Expository Texts

Identify the topic sentence/main idea.

- ❑ Usually first sentence in paragraph
- ❑ Sometimes last sentence
- ❑ Sometimes in the middle
- ❑ If none, must be inferred

PHAST PACES/Empower™ High School
Comprehension Strategy Track

FLEXIBLE · SELF–GUIDED · MULTI–STRATEGIC

Interpretation · Text to World
Applications · Text to Text
Elaborations · Text to Self

Expert
Summarizing
Evaluating through Questions
Clarifying
Activating Prior Knowledge
Predicting

METACOGNITIVE STRATEGIES

Preliminary Efficacy Study
268 PHAST PACES and 83 Control Students

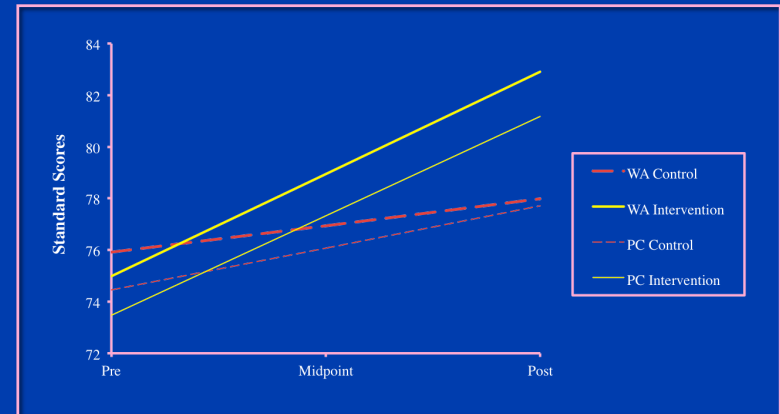**Quasi-Experimental Design**

Intervention

60-70 Hours of PHAST PACES Instruction

Control

On Waiting List for PHAST PACES Instruction

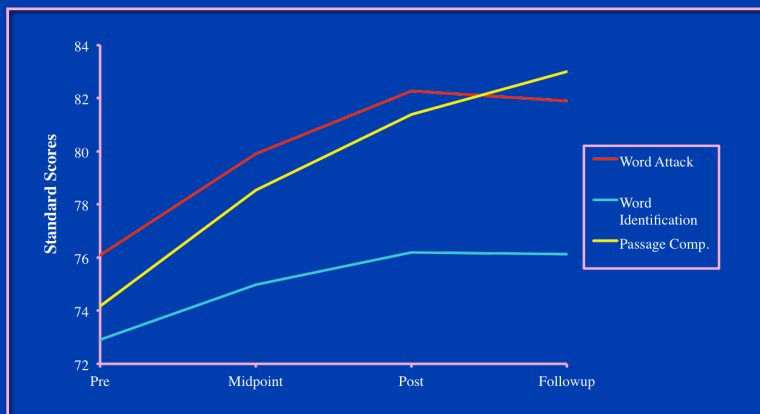## Performance for 268 PHAST PACES and 83 Control Participants
(WRMT-R Word Attack and Passage Comprehension standard scores)

Model-derived means for two subtests (Word Attack (WA), Passage Comprehension (PC)) of the Woodcock Reading Mastery Tests across the intervention period for Control and Intervention Participants.

Lovett, Lacerenza, De Palma, & Frijters, *Journal of Learning Disabilities,* 2012.

Intervention and Follow-Up for 197 PHAST PACES Participants
(WRMT-R Word Attack and Passage Comprehension standard scores)

Model-derived means for two subtests (Word Attack (WA), Passage Comprehension (PC)) of the Woodcock Reading Mastery Tests across the intervention period for Control and Intervention Participants.

Lovett, Lacerenza, De Palma, & Frijters, *Journal of Learning Disabilities,* 2012.

Findings from PHAST PACES Study

- Significant gains on standardized word attack, word reading, and passage comprehension tests following PHAST PACES
- Significant gains in letter-sound knowledge and multisyllabic word identification
- Average effect size of .68 across outcomes
- At one year follow-up, passage comprehension showed continued growth.
- More variable outcomes in high school participants.

Looking at individual stories rather than group results . . .

What do outcomes look like
for children or adolescents
receiving intervention
at different stages of development?

COOPER

With 125 Hours of Intervention in Grade 1
(change on standardized tests)

Woodcock (ss):	Pretest	End Gr1 (125 hrs)	End Gr2 (250 hrs)	F-Up Gr3
Basic Skills Composite	79	125	128	125
Word Attack	73	122	128	127
Word Identification	62	123	129	123
TOWRE Word Rdg Efficiency	45	119	133	132
SRI Reading Quotient	--	118	124	133
WIAT Listening Comprehension	74	--	--	107

COOPER

With 125 Hours of Intervention in Grade 1
(change on standardized tests)
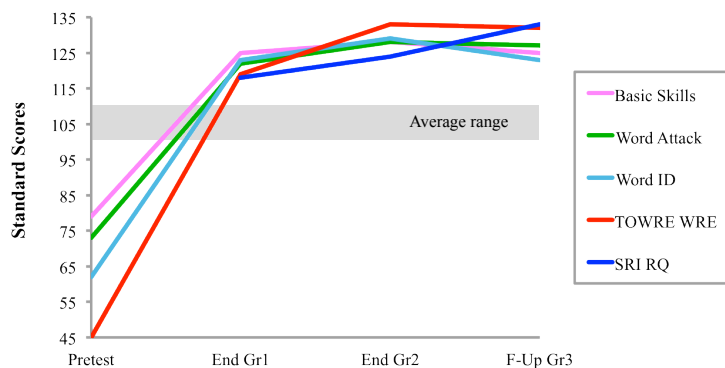
COOPER

In Adolescence

Currently in Grade 9 in French Immersion. A straight A student and athletic. Has not required any special education support. An avid reader; prefers fantasy; devours books, says mother. Only weakness is with writing. Self-motivated; has the attitude that he can achieve anything he puts his mind to; applies to school work and sports.
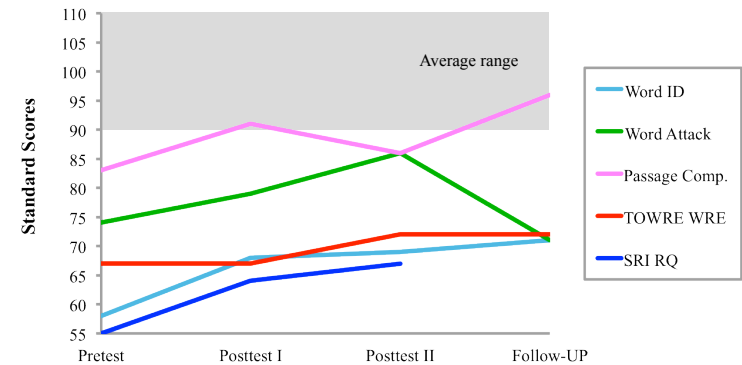
JULIA

Two Semesters of Intervention
(120-130 Hours)

Standardized:	Pretest	Posttest I	Posttest II	Follow-Up
Word Identification	58	68	69	71
Word Attack	74	79	86	71
Passage Comprehension	83	91	86	96
Word Reading Efficiency (TOWRE)	67	67	72	72
SRI Reading Quotient	55	64	67	--

JULIA

Two Semesters of Intervention
(120-130 Hours)

JULIA

Three Years Later

Grade 10: Julia completed Grade 10 Applied English. Passed Grade 10 Literacy Tests (OSSLT); GPA of 77%.

Grade 11: Made the Honour Roll and won silver medal in school History Fair; no special resource support needed.
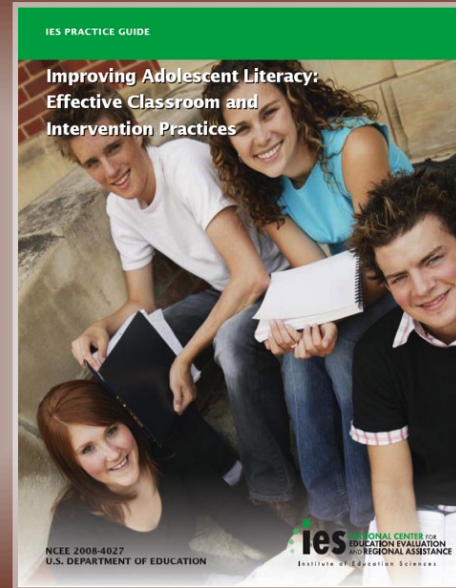
Grade 12: Made Honour Roll again; enjoys reading. Applying to college for ECE program; wants "to help young children become good readers." Younger sister currently in program.
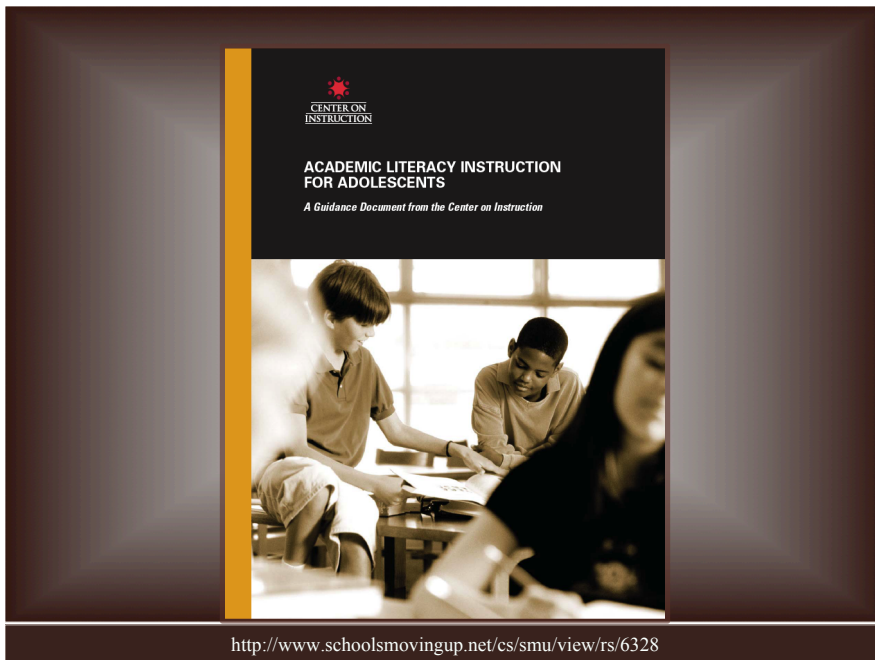

How do you build a good comprehender?

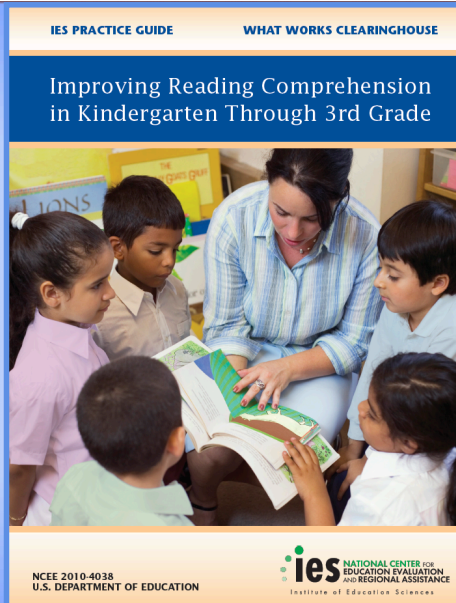## Recommendations for teaching reading comprehension

- ❑ Provide direct and explicit comprehension strategy instruction.
- ❑ Teach the skills and knowledge needed to use the strategies effectively.
- ❑ Provide explicit vocabulary instruction.
- ❑ Provide opportunities for extended discussion of text meaning and interpretation.
- ❑ Ask good questions that facilitate deeper processing of text meaning.
- ❑ Increase student motivation and engagement in literacy learning.

IES PRACTICE GUIDE

Improving Adolescent Literacy: Effective Classroom and Intervention Practices

NCEE 2008-4027
U.S. DEPARTMENT OF EDUCATION

http://ies.ed.gov/ncee/wwc/pdf/practiceguides/adlit_pg_082608.pdf

CENTER ON INSTRUCTION

ACADEMIC LITERACY INSTRUCTION FOR ADOLESCENTS

A Guidance Document from the Center on Instruction

http://www.schoolsmovingup.net/cs/smu/view/rs/6328

IES PRACTICE GUIDE   WHAT WORKS CLEARINGHOUSE

Improving Reading Comprehension in Kindergarten Through 3rd Grade

NCEE 2010-4038
U.S. DEPARTMENT OF EDUCATION

ies.ed.gov/ncee/wwc/pdf/practice.../readingcomp_pg_092810.pdf

WRITING NEXT

A Report to Carnegie Corporation of New York

WRITING NEXT

EFFECTIVE STRATEGIES TO IMPROVE WRITING OF ADOLESCENTS IN MIDDLE AND HIGH SCHOOLS

By Steve Graham and Dolores Perin

ALLIANCE FOR EXCELLENT EDUCATION

http://www.all4ed.org/publication_material/reports/writing_next

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Reading comprehension software using text-to-speech technology

UDL Editions by CAST

textHELP

Help

About UDL Editions by CAST
UDL Editions take advantage of the flexibility of digital media to reach and engage all learners. Leveled supports and the Texthelp Toolbar balance challenge and support for each learner, ages 10 and up. Select your book to get started!

- How Coyote Stole Fire
- About Coyotes
- Call of the Wild
- The Tell-Tale Heart
- The Gettysburg Address
- Sonnet XVIII
- The Life of Lazarillo de Tormes and of His Fortunes and Adversities

Universal Design for Learning
CAST is a non-profit research and development organization dedicated to Universal Design for Learning (UDL). UDL research demonstrates that the challenge of diversity can and must be met by making curriculum flexible and responsive to learner differences.

▶ About UDL
▶ UDL Feature Highlights
▶ For More Information

The CAST UDL Editions website is dedicated to our programmer, Erik Ray, a wonderful, creative, and hardworking friend and co-worker whose kindness and quirky style will be truly missed.
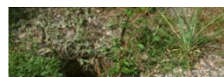

Coyotes and their Families ← Page 1 →

When most people think of coyotes, they often associate them with dogs or wolves. In fact, coyotes, dogs and wolves are all part of the same family. Each type of animal has special traits that make them unique. Coyotes have many fascinating characteristics that make them fun to study.
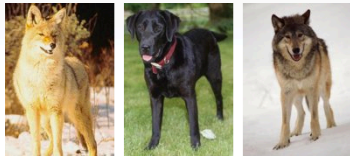
Coyotes are fairly small animals, weighing between 20 and 50 pounds. They are about the size of a Collie dog. Their fur is tan or gray-colored, and some coyotes have white bellies. Coyotes that live in cold climates grow thick fur coats in the winter to protect them from the cold.

Coyotes usually live in sheltered areas. They live in dens only when a female is giving birth or when there is bad weather. The dens can be made out of old badger or

Go to page: ☐ of 5 → ← Page 1 →

Coyotes and their Families ← Page 1 →

Coyotes usually live in sheltered areas. They live in dens only when a female is giving birth or when there is bad weather. The dens can be made out of old badger or fox holes, or hollows in the side of rocky ledges.

Coyotes live in packs that usually have between 3 and 8 members. The pack travels together and shares food. When a female coyote gives birth to her pups, she will go into a den alone. A litter is usually between 6 and 8 pups. Females birth a litter almost every year!

Coyotes are opportunistic animals. This means that they take advantage of any food they can find. A normal coyote's diet includes rabbits, mice, birds, and most other wild animals. Although they live in packs, coyotes like to hunt alone. When hunting, they can run up to 40 miles per hour. Coyotes are omnivores, so they will also eat all kinds of fruit and vegetables. However, when their food supply is low, coyotes will wander into urban areas to look for food. A starving coyote will eat garbage, garden vegetables, and even small pets.

Go to page: ☐ of 5 → ← Page 1 →

Fact or Fiction? ← Page 4 →

Native American folklore is filled with tales of the "trickster" coyote, like "How Coyote Stole Fire." Coyote earned a reputation for being a sly, sneaky predator. Stories of his adventures have been retold for hundreds of years. As a result, it is sometimes hard to tell the difference between "coyote fact" and "coyote fiction." Here are some common myths about coyotes - and some facts to help you decide whether or not they are true.

One coyote myth is that coyotes sometimes hunt human beings. This is fiction! Coyotes do not hunt human beings. In fact, coyotes are likely to be more scared of us than we are of them. They are naturally shy animals. Coyotes will only attack when they feel frightened. If you run into a coyote that comes too close, the best thing to do is stand as tall as possible, wave your arms, and make a lot of noise. Usually the coyote will run away.

Another myth about coyotes is that they always steal and eat livestock. Farmers are often anxious about coyotes attacking their animals, so they set traps and put up fences to keep them away. Many times, coyotes are blamed for damage done by dogs. In fact, coyotes rarely eat livestock unless they are injured or starving, and lacking other food to eat. Coyotes that live close to humans may struggle to find enough food in the wild. If they come across a food source such as livestock, they will

Go to page: ☐ of 5 →

Stop and Think! Level 1 2 3 x

Question — Reading Strategy

Choose a question that is about something important to know and remember about this passage:

○ What do I know about coyotes, and how did I come to know this?
○ Why are there many myths about coyotes?
○ Why is it hard to tell the difference between 'coyote fact' and 'coyote fiction'?

Click "Show" to see the clues that helped the coaches create good questions.
Show

Click on the Coaches for help.

Done

Stop and Think!

Question

that surround coyotes. Therefore, I should ask a question that helps me

Monty's Thoughts
This passage talks about things that surround coyotes. Therefore, I should ask a question that helps me remember that stories about coyotes can be myths.

Listen

Monty's Response
The author says that coyotes earned their reputation through folklore. When I ask myself how coyotes got their reputation, I will remember that stories about coyotes were passed down and could be therefore be myths.

Done

---

icon Improving Comprehension Online

To develop and test a universally designed (Rose & Meyer, 2002) strategic digital reading approach (Dalton & Proctor, 2007) to improving reading achievement of 5th grade students, including bilingual students and struggling readers.

CAST Folktales — Universal Learning Edition

1/31/08 Great job on questions - you really focus on what's important.
12/13/07 Wow! You are making excellent progress on your strategies.

How am I Doing?

Select Book — Select Level

Hungry Spider and Turtle | Spider Sense: Facts About Spiders | How Coyote Stole Fire | All About Coyotes

Bird Cu | Aztecs | Why the Sun Travels Slowly Across the Sky | All About the Sun

Go

Dalton, Proctor, & Snow (2008)

---

icon Coaches

Level 1 coaches provide text-specific models and think alouds. As skill increases, students select strategies and coaches provide generic think-alouds.

CAST Folktales
home | glossary | strategy help
back

Pat's Thoughts
I know that folktales often explain how something came to be. I think this folktale will explain how birds like bird Cu changed a long time ago.

en español
Listen

Pat's Response
I predict bird Cu will find a way to make her feathers bright and brilliant.

CAST Folktales
home | glossary | strategy help
back

Pat's Thoughts
Sé que los cuentos folklóricos generalmente explican el por qué de algo. Creo que este cuento folklórico explicará cómo, hace mucho tiempo, cambiaron los pájaros como el pájaro Cucú.

in English
Listen

Pat's Response
Predigo que el pájaro Cucú hará algo para que sus plumas sean coloridas y brillantes.

Dalton, Proctor, & Snow (2008)

Panel 1 — Interactive Vocabulary: Connect it!

icon

Interactive Vocabulary
Connect it!

©CAST folktales BiRD CU

home | glossary | strategy help | resources | worklog | 0 1 2 3 4 5 6 | activities | logout

wade in

Wade In to each power word to explore its meaning. Read it, view it, hear it, connect it to make this word your own, and then learn more about the word with a **Language Alert**. Click on any word to begin!

en español

brilliant   disobedience

flow   furious

vain

Example sentence:
All the lights went on at the same time, and they looked brilliant.

La palabra en español es:
brillantes

Boat and building decorated with brilliant, shining lights.

Connect It. Make a personal connection to the power word using your own experience, knowledge and feelings. Type or record your response and save to worklog.

en español

Pat

hear-it   **connect-it**

0:02

Brilliant makes me think of watching the fireworks because the sky is full of brilliant colors.

record   save   next

Dalton, Proctor, & Snow (2008)

Panel 2 — Interactive Vocabulary: Language Alert

icon

Interactive Vocabulary
Language Alert

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home | glossary | strategy help | resources | worklog | 0 1 2 3 4 5 6 | activities | logout

wade in

Wade In to each power word to explore its meaning. Read it, view it, hear it, connect it to make this word your own, and then learn more about the word with a **Language Alert**. Click on any word to begin!

en español

brilliant   disobedience

flow   furious

vain

language ALERT

Brilliant can describe something that is **shiny and bright** like the sun. Or **brilliant** can describe a really **smart person**, especially if she has a **brilliant** light bulb over her head. You are more **brilliant** now that you know so many words!

Pat   en español

next

Dalton, Proctor, & Snow (2008)

Panel 3 — Interactive Vocabulary: Web it!

icon

Interactive Vocabulary
Web it!

©CAST folktales BiRD CU

home | glossary | strategy help | resources | worklog | 0 1 2 3 4 5 6 | activities | logout

dive in

Dive in deeper to learn more about the meaning of each power word. Use **Web It** to stretch your word knowledge and then have fun showing your word flexibility with **Caption It**.

en español

brilliant   disobedience

flow   furious

vain

brilliant
Very colorful or bright.

Example sentence:
All the lights went on at the same time, and they looked brilliant.

La palabra en español es:
brillantes

web-it Spin your word knowledge to create a web that connects the power word with the word relationships that surround it. Click on the word in the yellow circle and select the answer that shows that relationship. Click the blue circle to type your own word and its relationship to the power word. Last, save to worklog.

en español

synonym (same)   **antonym (opposite)**

○ bright   [X]
○ Homer Simpson
○ Albert Einstein
○ dull

brilliant

related word or phrase:

relationship: [X]

brilliant person

Dalton, Proctor, & Snow (2008)

Panel 4 — Interactive Vocabulary: Caption it!

icon

Interactive Vocabulary
Caption it!

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home | glossary | strategy help | resources | worklog | 0 1 2 3 4 5 6 | activities | logout

caption-it

Make this image come alive by adding an interesting caption that includes the power word and shows your understanding of the word. Start by clicking on the coach for great examples. Try experimenting with statements, dialogues and questions. Write or record your response. Last, save to worklog.

dive in

Dive in deeper to learn more about the meaning of each power word. Use **Web It** to stretch your word knowledge and then have fun showing your word flexibility with **Caption It**.

en español

brilliant   disobedience

flow   furious

vain

brilliant
Very colorful or bright.

Example sentence:
All the lights went on at the same time, and they looked brilliant.

La palabra en español es:
brillantes

Pat   en español

Maya: The lights are so brilliant and pretty!
Sonia: I wonder how much the electricity bill is??!!!

record   save   next

Dalton, Proctor, P, & Snow (2008)

Has Reading Changed?

The Evolution of Reading

GoneReading™

A generational culture shift?
Or a more fundamental change in how we think and learn?

http://www.nytimes.com/2008/07/27/books/27reading.html

Reading in print and
reading on the internet *are* different

- ❏ On paper, text has a predetermined beginning, middle, and end, and readers focus for a time on one author's vision.
- ❏ On the internet, readers move through sites at will and essentially compose their own beginnings, middles, and ends.
- ❏ ***Does this change the system of skills children need to learn to become literate?***

- ❏ How should we think about teaching children to read in a digital age?
- ❏ Have the definitions of reading development and literacy changed in the new millennium?
- ❏ Are we any further ahead in understanding what struggling readers need to become better readers?
- ❏ Can we use the contributions of the digital age to better remediate or even prevent reading problems?

Reading is all about language on any platform—from books to smartphones

- Absorbing language by vision . . . language by ear *and by eye.*
- Reading is parasitic on speech and oral language development.

Traditional uses of technology in supporting struggling learners

Assistive technology as accommodation
(Supplying what the struggling learner cannot)

Decoding/reading: Text-to-speech (Kurzweil, dictionaries, e-summaries)

Writing: Speech-to-text (Dragon, Inspiration)

Writing composition: Writing aids (graphic organizers, e-summaries, word prediction)

Lower-level writing: Editorial aids (spell checks, grammar checks)

The potential role for new technologies to provide instruction

- Beyond accommodation to individualized instruction and practice within a group setting.
- Training for fluency—a difficult benchmark.
- Facilitating engagement with language and print and ideas.
- Providing vocabulary support.
- Teaching background knowledge.

The most valuable use of new technologies may be

in building better comprehenders!

Newer Applications

Intelligent tutoring systems have the potential to:

- Provide individualized tutoring tailored to the reader's needs.
- Free teacher to work more intensely with individuals and small groups, while rest of class is moving forward.
- Provide detailed progress data on every student.

For struggling readers—two major potential roles:

- Teach students to be deep comprehenders.
- Narrow the gap in reading experience for struggling readers.

AutoTutor (Graesser, Lu, Jackson et al., 1994)
iSTART (McNamara, Levinstein, & Boonthum, 2004)

How should we think about teaching children to read in a digital age?

- **Have the definitions of reading development and literacy changed in the new millennium?**
  Not really. Reading is still all about language, but added digital literacy skills are demanded of skilled readers.

- **Are we any further ahead in understanding what struggling readers need to become better readers?**
  Yes, better understanding of requirements for reading success, of risk factors, of effective remediation for struggling readers of any age.

- **Can we use the contributions of the digital age to better remediate or even prevent reading problems?**
  Yes, with principled design and focused use, web-based ITS can be developed to enhance reading instruction and remediation and to provide much needed extra practice in reading.

Putting things in context

- Technology as an adjunct to and support for effective teaching . . . nothing replaces the relationship between teacher and student, the mentorship and alliance formed.

- Teacher needs to direct technology use.
- Digital learning to promote specific reading goals.
- Evaluation and controlled research needed to measure the efficacy of different applications and specify for whom it is most useful.

A final thought

- With good partnerships and hard work, we can harness the potential of new technologies to better meet the needs of struggling readers of all ages.

- We can use technology and tap into the interests of digital-savvy students to inspire motivation, interest, and lifetime engagement with text in any form and with the world of ideas.

Learning Disabilities Research Program
The Hospital for Sick Children

SickKids | **UNIVERSITY OF TORONTO**

Maureen W. Lovett	Léa Lacerenza	Sue Butler
Jan C. Frijters	Denis Murphy	Devi Rodgerson
Karen A. Steinbach	Debbie Boland	Anthony Pedace
Maria De Palma	Glen McLeod	Naomi Badger
Meredith Temple	Tammy Cohen	Amanda Bertoia
Jennifer Goudey	Anita Van Oorschot-Settle	
Madeline MacKenzie	Odile Defigueiredo	

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Partnerships to help children and adolescents struggling to learn to read

2006-2013

Participating Schools/ School Boards

- Toronto Catholic District School Board
- Waterloo Region District School Board
- Dufferin-Peel Catholic District School Board
- Hamilton-Wentworth District School Board
- Peel District School Board
- Peterborough Victoria Northumberland & Clarington Catholic District School Board
- Provincial Schools Branch: Demonstration Schools
- Northeastern Catholic District School Board
- Waterloo Catholic District School Board
- Ottawa-Carleton District School Board
- Toronto District School Board
- Thunder Bay Catholic District School Board
- Near North District School Board

- District School Board of Niagara
- Institute of Child Study, University of Toronto
- Algonquin-Lakeshore Catholic District School Board
- Vancouver School Board, British Columbia
- Brandon School Division, Manitoba
- Avon Maitland District School Board
- Suzuki Charter School (Edmonton)
- Kol Koreh Literacy Project
- Upper Canada District School Board
- Hastings and Prince Edward District School Board
- Montcrest School
- Olive Grove School
- Thames Valley School Board
- Halton Catholic District School Board
- Hamilton-Wentworth Catholic District School Board

Since 2006: >900 teachers trained in, and >8500 students received Empower™ Reading

Empower™ © The Hospital for Sick Children 2006

NICHD Multi-Site Studies

ATLANTA	BOSTON	TORONTO
Robin D. Morris, PI	**Maryanne Wolf, PI**	**Maureen W. Lovett, PI**
Rose Ann Sevcik	Beth O'Brien	Karen A. Steinbach
Eileen Adamson Cohen	Katharine Donnelly	Jan C. Frijters
Mary Bucklen	Stephanie Gottwald	Léa Lacerenza
Cashawan Myers	Terry Joffe	Maria De Palma
Victoria Burke	Lynne T. Miller	Meredith Temple
Fontina Rashid	Jill Ludmar	Gail Porter
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National Institute of Child Health and Human Development (NICHD)
Institute of Education Sciences (IES)
Centre of Excellence in Child and Youth
Mental Health at CHEO
Canadian Institutes for Health Research
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Toronto Catholic District School Board
Waterloo Region District School Board
Hamilton Wentworth District School Board
Waterloo Catholic District School Board
and
Provincial Schools Branch: Demonstration Schools

RESEARCH helps...

. . . kids all over the place!

Any Questions?

empower™
READING

For Program Inquires Please Contact
Karen Steinbach (karen.steinbach@sickkids.ca)
Maria De Palma (mdepalma@sickkids.ca)
OR
The LDRP Office (ldrp@sickkids.ca)

About Kids Health
http://www.aboutkidshealth.ca

American Academy of Child and Adolescent Psychiatry
http://www.aacap.org

AACAP Resource Centers empower consumers through patient education. Each AACAP Resource Center contains consumer-friendly definitions, answers to frequently asked questions, clinical resources, expert videos, and abstracts from the *JAACAP*, *Scientific Proceedings* and *Facts for Families* relevant to each disorder

American Academy of Pediatrics
http://www.aap.org

Great Schools
http://www.greatschools.org

International Dyslexia Association
www.interdys.org

Learning Disabilities Association of Ontario
www.ldao.ca

National Reading Panel
www.nationalreadingpanel.org

Put Reading First: Helping Your Child Learn to Read
http://www.nifl.gov.nifl/partnershipfor/reading/publications/PFRbrochure.pdf

Put Reading First: The Research Building Blocks for Teaching Children to Read
http://www.nifl.gov/nifl/partnershipforreading/publications/PFRbooklet.pdf

Taking the First Step: A Guide for Parents of Students with Learning Disabilities
http://aboutld.org/LD_English.pdf

For ADHD

www.addvance.com

www.add.org

www.chadd.org

www.additudemag.com/additude.asp

***www.nichq.org/resources/toolkit**

www.sdqinfo.com

http://coe.jmu.edu/learningtoolbox

For LD/teaching Strategies

www.ldonline.org/ld_indepth/teaching_techniques

www.fcrr.org (science of reading)

www.quickreads.org (engineered texts

www.jumptutoring.org (math strategies)

www.ku-crl.org (teaching strategies)

http://nationalreadingpanel.org/

A number of strategies for different academic problems by the authors of *Academic success strategies for adolescents with learning disabilities and ADHD* (Minskoff,E. & Allsopp, D., 2003)

I. Excellent books for parents and teachers:

Hall, S.L., & Moats, L.C. (2002). *Parenting a Struggling Reader: A Guide to Diagnosing and Finding Help for Your Child's Reading Difficulties.* **New York, NY: Broadway Books (Random House).**

This is a comprehensive, informative guide for parents of children with reading difficulties. This book describes how parents can identify the problem and advocate for assessment and treatment for their child. Tests commonly used to assess and diagnosis reading disabilities are explained and parents learn how they can prepare for and participate in school meetings where goals are selected to help their child overcome his/her reading difficulty. The balance between the use of accommodations to support academic progress in the older struggling reader and intensive systematic instruction to remediate their reading difficulties is discussed.

An earlier book by the same authors: Hall, S.L., & Moats, L.C. (1999). *Straight Talk About Reading: How Parents Can Make a Difference During the Early Years*. Chicago, IL: Contemporary Books.

McCardle, P., Chhabra, V., & Kapinus, B. (2008) *Reading Research in Action: A Teacher's Guide for Student Success.* **Baltimore MD: Paul H. Brookes.**

Inspired by questions from real teachers, the authors of this book give K–8 educators clear and useful answers about reading research and what it says about the elements of effective instruction: What does research say about teaching each component of reading—vocabulary, alphabetics, fluency, comprehension, spelling, and writing? Why is Response to Intervention so important? How can I get students engaged and motivated to read? Answers to these critical questions are provided with simple, straightforward explanations of research findings and brief vignettes that demonstrate how to work research-based practices into classroom reading instruction. A user-friendly guide, this book will help teachers see the benefits of instruction based on research—and use it skillfully to make all their students better readers. It can also be a very useful resource to parents interested in learning more about what effective evidence-based instruction looks like.

Moats, L.C. & Dakin, K.E. (2007). *Basic Facts About Dyslexia and Other Reading Problems.* **Baltimore, MD: The International Dyslexia Association.**

This is a practical and very readable book for parents and teachers of children with reading problems. From the *Basic Facts Series* published by the International Dyslexia Association, this book begins by answering the question "What is dyslexia?" and what are its signs at various stages of development. The book includes information on the emotional consequences of reading difficulties, essential elements of effective reading instruction, and treatment options for individuals with severe forms of dyslexia and other reading problems. A list of valuable website resources are included at the end of the book.

Shaywitz, S.E. (2003). *Overcoming Dyslexia.* **New York, NY: Alfred A. Knopf.**

Written by a pediatrician and well-known expert on dyslexia, this is a comprehensive book to help parents and professionals understand the reading problems experienced by millions of children, adolescents, and adults. Drawing on scientific evidence—including findings from her own research—Sally Shaywitz offers hope that children with reading problems can be helped. She describes how magnetic resonance imaging has helped researchers discover a weakness in the language system at the phonological level in individuals with dyslexia, and she explains that through use of effective training programs, this weakness can be overcome and dyslexic children can learn to read. The author walks parents through ways to help children develop phonemic awareness, become fluent readers, and exercise the area of the brain essential for reading success. Early diagnosis and effective intervention are of critical importance, but even older struggling readers can learn to read skillfully with proper intervention. Parents will find advice on what approaches and techniques will help their children develop the skills to be successful readers.

II. Additional Resources for Teachers:

Beck, I. L., & McKeown, M. G. (2006). *Improving Comprehension with Questioning the Author: A Fresh and Expanded View of a Powerful Approach.* New York, NY: Scholastic Inc.

Beck, I.L., McKeown, M.G., & Kucan, L. (2002). *Bringing Words to Life: Robust Vocabulary Instruction.* New York, NY: The Guilford Press.

Graham, S. & Harris, K.R. (2005) *Writing Better: Effective Strategies for Teaching Students With Learning Difficulties.* Cambridge, MA: Brookes.

Harris, K.R., Graham, S., Mason, L.H., & Friedlander, B. (2007) *Powerful Writing Strategies for All Students.* Cambridge, MA: Brookes.

Minskoff E, Allsop A (2003) *Academic success strategies for adolescents with learning disabilities and ADHD.* Baltimore, Maryland: Paul Brookes Pub.

Moats, L. C. (2010) *Speech to Print: Language Essentials for Teachers.* Baltimore, MD: Paul H. Brookes Publishing.

Moats, LC (2011) *Speech to Print Workbook: Language Exercises for Teachers.* Baltimore, MD: Paul H. Brookes Publishing.

Roditi, B. N., Steinberg, J. L., Bidale, K. R., Taber, S. E., Caron, K. B., & Meltzer, L. J. (2006). *Strategies for Success: Classroom Teaching Techniques for Students With Learning Differences* (2 ed.). Austin, TX: Pro-Ed, Inc.

III. Excellent books for those interested in a more detailed look at reading and reading disorders:

Dehaene, S. (2009) *Reading in the Brain: The Science and Evolution of a Human Invention.* **New York, NY: Viking.**

The act of reading is so easily taken for granted that we forget what an astounding feat it is. In this well written book, cognitive neuroscientist Stanislas Dehaene explores every aspect of this human invention, from its origins to its neural underpinnings. An authority on the subject, Dehaene reveals the hidden logic of spelling, describes pioneering research on how we process language, and takes us into a new appreciation of the brain and its wondrous capacity to adapt. Drawing on brain-imaging studies, case histories of stroke victims and cognitive psychology experiments, Dehaene diagrams the neural machinery that translates marks on paper into language, sound, and meaning. He proposes that reading is an example of neuronal recycling— the recruitment of previously evolved neural circuits to accomplish cultural innovations—and he uses this idea to explore how ancient scribes shaped writing systems around the brain's potential and limitations. Relevant to intervention issues, the author attacks modern whole language reading instruction as an unnatural imposition on a brain attuned to learning by phonics.

Fletcher, J. M., Lyon, G. R., Fuchs, L. S., & Barnes, M. A. (2007). *Learning disabilities: From Identification to Intervention.* **New York, NY: The Guilford Press.**

This book provides an excellent synthesis of what is known from research on the major types of learning disorders. Evidence-based and comprehensive, the book offers a new approach to understanding and intervening with students with learning disabilities. The authors are leading experts in neuropsychology and special education, and they present a unique model of learning disabilities that integrates the cognitive, neural, genetic, and contextual factors associated with these disorders. The book addresses classification, assessment, and intervention for the range of learning disabilities affecting reading, mathematics, and written language expression. Because the book focuses on analyzing and evaluating the evolving evidence base in the field, as well as articulating effective educational practices, it is a very useful resource for school psychologists, neuropsychologists, special educators, and others who work with struggling learners. The final chapter offers ten recommendations that serve as an agenda for future research and practice.

Wolf, M. (2007) *Proust and the Squid: The Story and Science of the Reading Brain.* **New York, NY: HarperCollins.**

Maryanne Wolf, a professor at Tufts University and a well known scholar, integrates psychology and archaeology, linguistics and education, history and neuroscience in this unique and readable book. She explores the development of the reading brain-a complicated phenomenon that Wolf seeks to chronicle from both the early history of humanity and the early stages of an individual's development ("unlike its component parts such as vision and speech...reading has no direct genetic program passing it on to future generations"). Along the way, Wolf introduces concepts like "word poverty," the situation in which disadvantaged children, by age five, have heard 32 million less words than their counterparts (with chilling long-term effects), and she makes time for amusing anecdotes. The third section of the book covers dyslexia, explaining clearly and expertly "what happens when the brain can't learn to read." This book synthesizes cutting edge, interdisciplinary research and describes it in an inviting and readable tone.