

# The Knowledge Gap: What It Is and How to Narrow It

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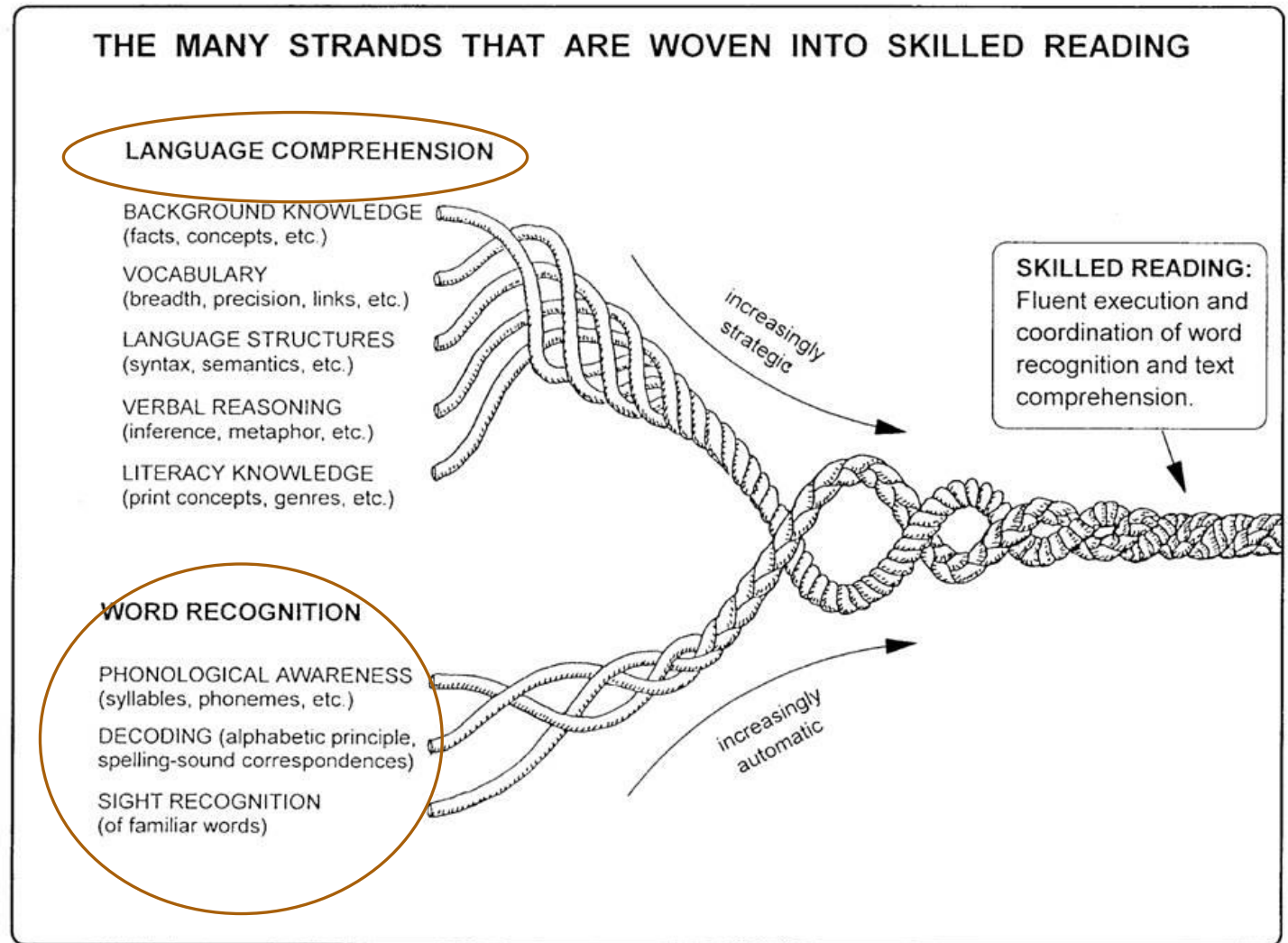
The “Problem”:  
High School



# The “Bright Spot”: Elementary School



# READING



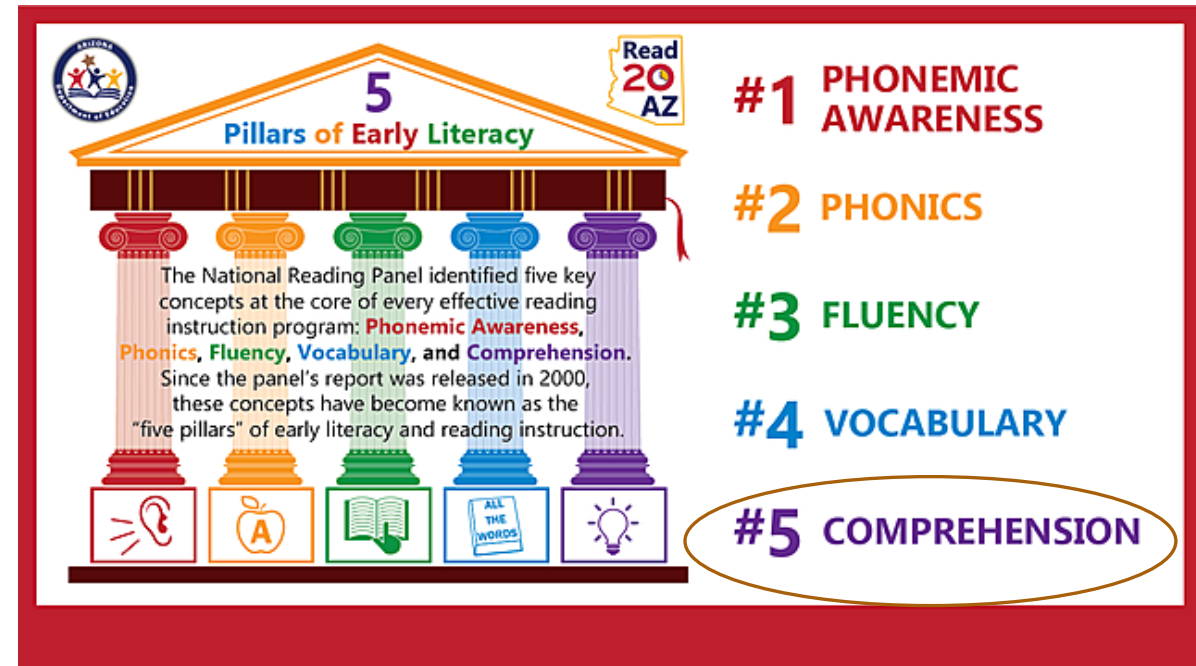
Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy* (pp. 97–110). New York, NY: Guilford Press.

# Other infographics depicting reading

## The Simple View of Reading



(Gough & Tunmer, 1986; Hoover & Gough, 1990)



Is there anything missing?

We'll come back to that.



# COMPREHENSION

## strategies vs. skills

- Using Schema
- Predicting
- Inferring
- Questioning
- Determining Importance
- Visualizing
- Synthesizing

- Main Idea & Details
- Author's Purpose
- Determining Theme
- Cause & Effect
- Summarize/Retell
- Sequence of Events
- Compare & Contrast
- Story Structure
- Classify & Categorize
- Fact & Opinion
- Drawing Conclusions
- Point of View
- Identifying Genre
- Describing Plot
- Making Predictions
- Figurative Language



The Standard Approach to Reading Comprehension, Part 1

## Progress Monitoring by Instructional Text Reading Level

GRADE	MONTHS OF THE SCHOOL YEAR									
	1	2	3	4	5	6	7	8	9	10
K	–	–	–	A	A/B	B	B	C	C	C
1	C/D	D	E	E/F	F	G	G/H	H	I	I
2	I/J	J	J	J/K	K	K/L	L	L	M	M
3	M/N	N	N	N	O	O	O	P	P	P
4	P/Q	Q	Q	Q	R	R	R	S	S	S
5	S/T	T	T	T	U	U	U	V	V	V
6	V/W	W	W	W	X	X	X	X	Y	Y
7	Y	Y	Y	Y	Y/Z	Z	Z	Z	Z	Z
8	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z
9-12	Z	Z	Z	Z+	Z+	Z+	Z+	Z+	Z+	Z+



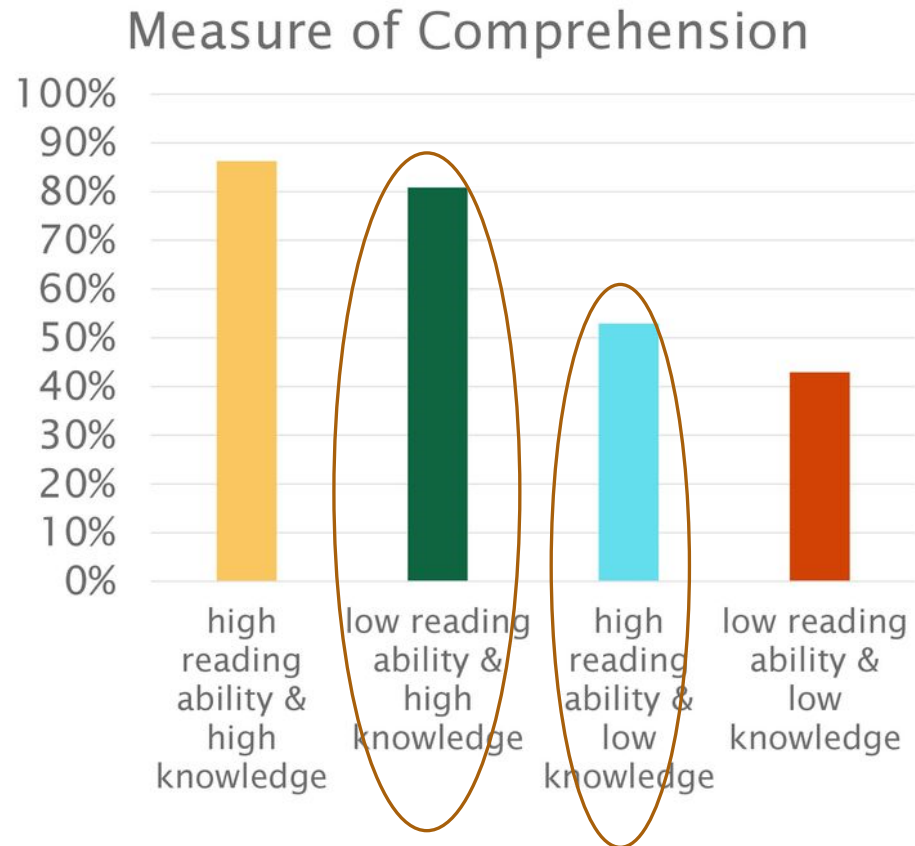
# The Standard Approach, Part 2: Leveled Reading



## Find the Main Idea

Much depended on the two overnight batsmen. But this duo perished either side of lunch—the latter a little unfortunate to be adjudged leg-before—and with Andrew Symonds, too, being shown the dreaded finger off an inside edge, the inevitable beckoned, bar the pyrotechnics of Michael Clarke and the ninth wicket.

The main factor in comprehension—skills, or knowledge of the topic?



The Baseball Study (Recht and Leslie, 1988)

This study and many others show:

- Comprehension “skills” aren’t skills like riding a bike—they don’t just get better with practice.
- There’s no such thing as a fixed “reading level.”

# We draw on background knowledge to understand *everything* we read.

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There's a strong correlation between:

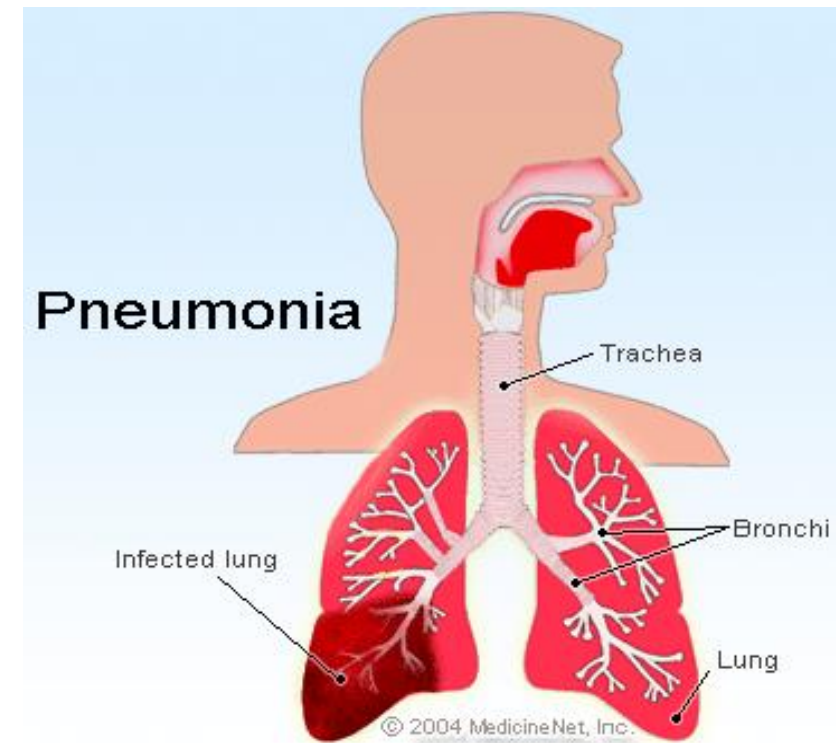
1. General academic knowledge (e.g., "In what part of the body does pneumonia occur?")

AND

2. General reading comprehension

Which suggests that ...

To boost reading comprehension, kids need to acquire as much academic knowledge and vocabulary as possible.



What  
knowledge do  
you draw on  
to understand  
a newspaper  
article?

Two appeals by the president, in his private capacity and represented by private lawyers, have reached the Supreme Court in the past week. One, *Trump v. Vance*, is a formal appeal from a ruling by the federal appeals court in New York upholding the validity of a grand jury subpoena obtained by the Manhattan district attorney, Cyrus Vance, and served on the president's accountants for his personal and business tax records.

If you're unfamiliar with terms relating to the law ...

Two [REDACTED] by the president, in his private capacity and represented by private lawyers, have reached the [REDACTED] [REDACTED] in the past week. One, *Trump v. Vance*, is a formal [REDACTED] from a ruling by the [REDACTED] in New York upholding the validity of a [REDACTED] obtained by the Manhattan [REDACTED], Cyrus Vance, and served on the president's accountants for his personal and business tax records.

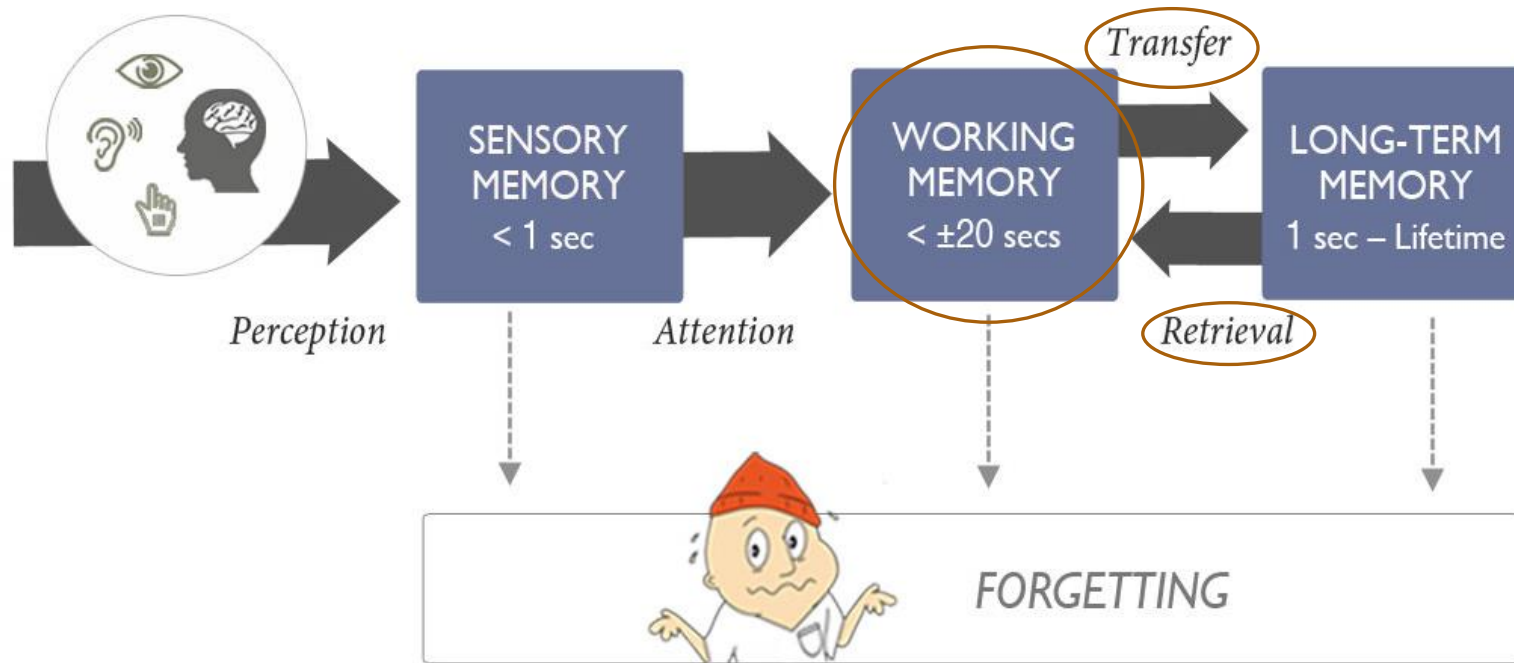
If you're unfamiliar with general academic vocabulary and complex syntax ...

How do you acquire THAT knowledge?

Through knowledge of TOPICS.

Two [redacted] by the president, in his private [redacted] and [redacted] by private lawyers, have reached the [redacted] t in the past week. *One, Trump v. Vance, is a* [redacted]

# Why knowledge helps with comprehension



“Cognitive load” = the burden placed on working memory

# What does all this have to do with test-score gaps?

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# Passage from Third Grade PARCC Test

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In one of the most remote places in the world, the Canadian Arctic, a people have survived over a thousand years. They are the Inuit. For the Inuit, the Arctic is a place teeming with life. Depending on how far north they live, the Inuit find everything from caribou herds and polar bears to beluga whales.

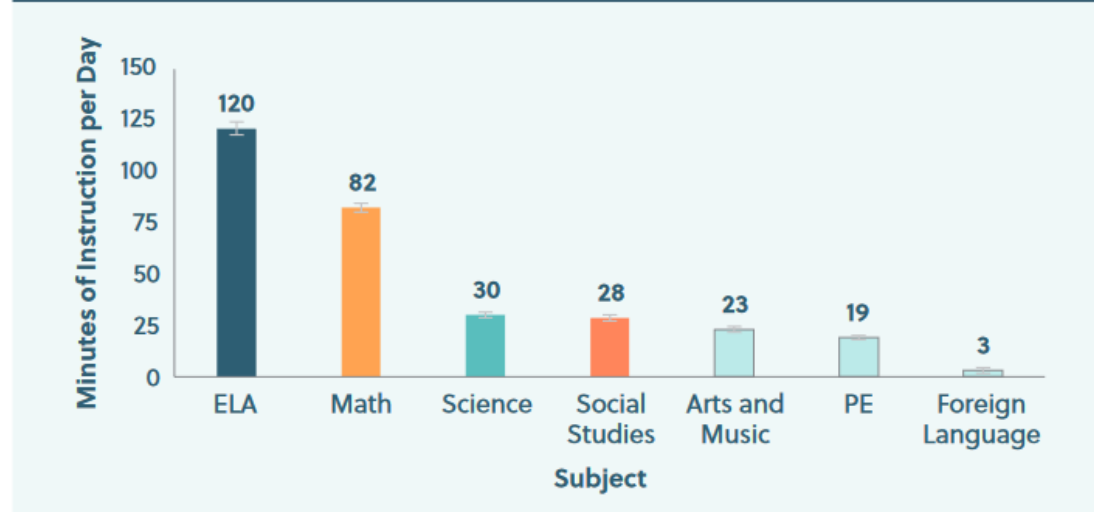
In one of the most [redacted] places in the world,  
the [redacted], a people have [redacted] over  
a [redacted] years. They are the [redacted]. For the  
[redacted], the [redacted] is a place [redacted] with life.  
Depending on how far north they live, the [redacted]  
find everything from [redacted] [redacted] and [redacted]  
[redacted] to [redacted].

# The Elementary Curriculum

How much time do elementary students spend each day on ...

- ELA?
- Math?
- Science?
- Social Studies?
- Arts?

Figure 2. Students spend an average of two hours per day on ELA instruction.



Note: The figure contains pooled averages of grades 1 through 5. The mean total instructional time is 302 minutes per day. Analytic sample includes 6,829 students. "Arts and music" includes art, music, dance, and theater. Error bars represent 95 percent confidence intervals.

Source: Adam Tyner and Sarah Kabourek. Social Studies Instruction and Reading Comprehension: Evidence from the Early Childhood Longitudinal Study. Washington D.C.: Thomas B. Fordham Institute (September 2020). (Based on data for students who started K in 2010-11.)

# Why does it look like high school is the problem?

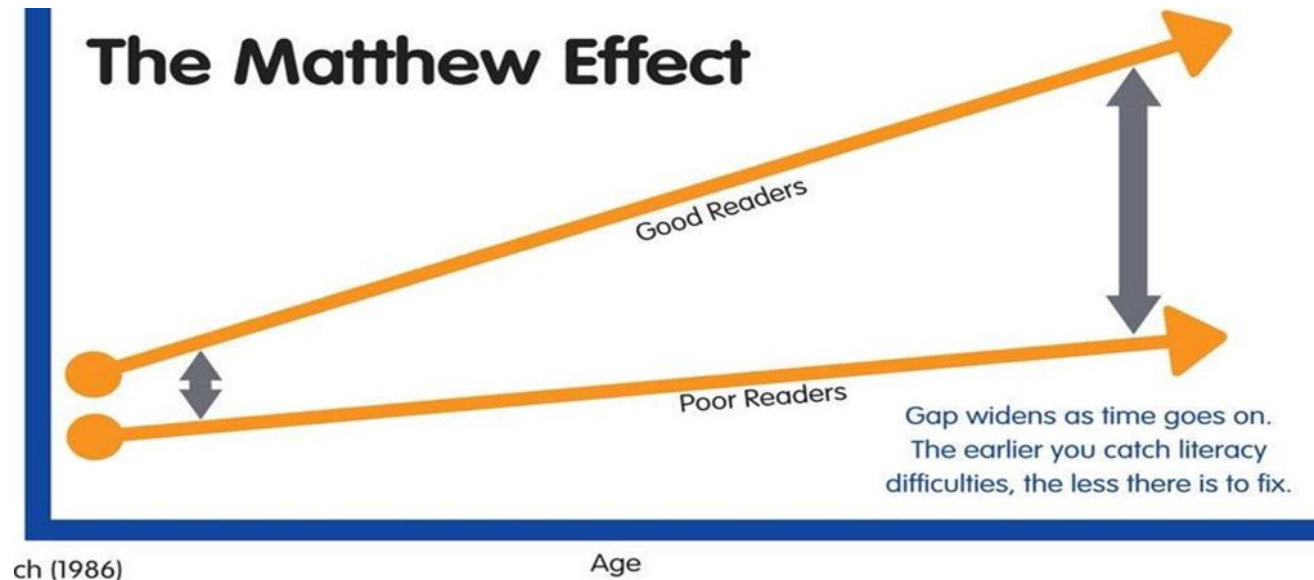
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Knowledge is like  
Velcro—  
it sticks to other  
related  
knowledge.



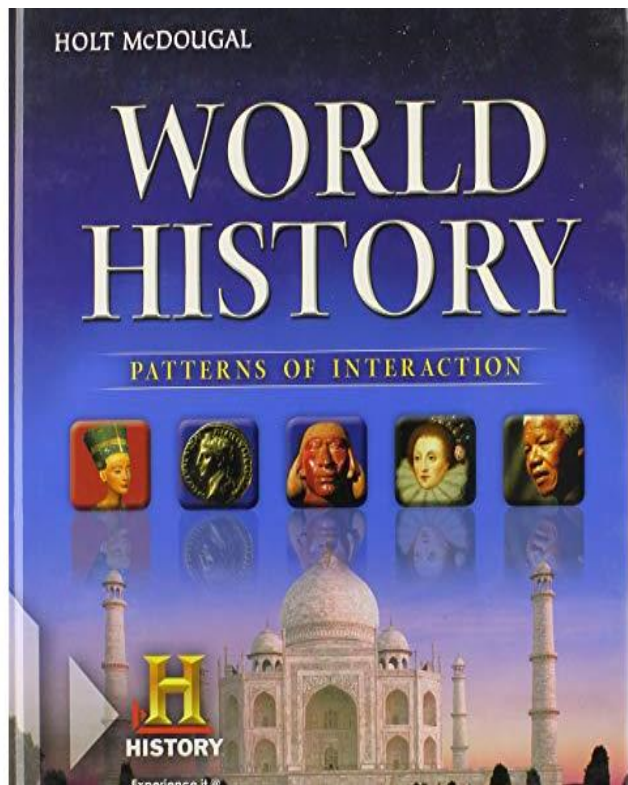
# Gap #1



It can *look* like the “skills and strategies” approach is working at lower grade levels ...

But the approach can backfire when students reach upper grades.

Building knowledge will be **MOST** effective if it starts early—**WHILE** students are acquiring foundational skills.



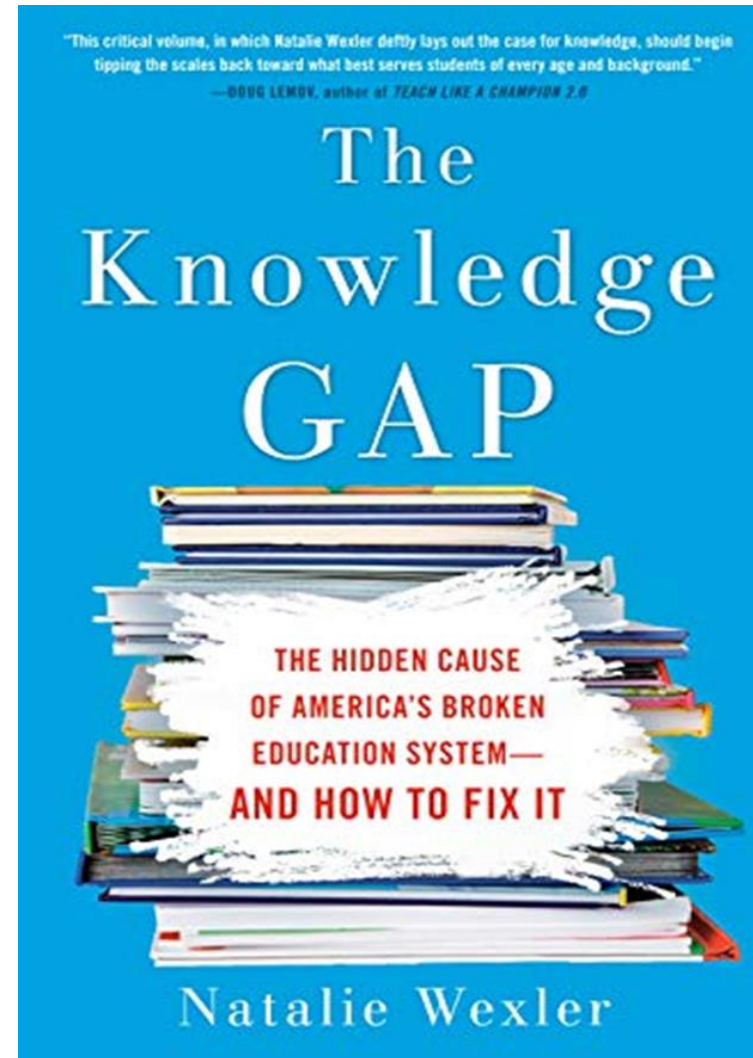
Part of released item from the SAT:

- 25 The nature of impeachment: a narrowly channeled exception to the separation of powers maxim. The Federal Convention of 1787 said that. It limited impeachment to high crimes and misdemeanors, and discounted and opposed the term “maladministration.” “It is to be used only for great misdemeanors,” so it was said in the North Carolina ratification convention. And in the Virginia ratification convention:
- 30 “We do not trust our liberty to a particular branch. We need one branch to check the other.”

Gap #2:

The difference between what we assume high school students know and what many do know

With remote  
and hybrid  
learning ...  
the situation  
has become  
more urgent  
than ever.







Where can we  
go from here?

# What can individual teachers do to narrow the knowledge gap?

1. Organize read-alouds by topic, not skill
2. Ask questions that put content in the foreground
3. Organize classroom libraries by topic
4. Be skeptical about reading levels
5. Spend lots of time on meaty social studies & science topics



# Where teachers can find free content-rich resources

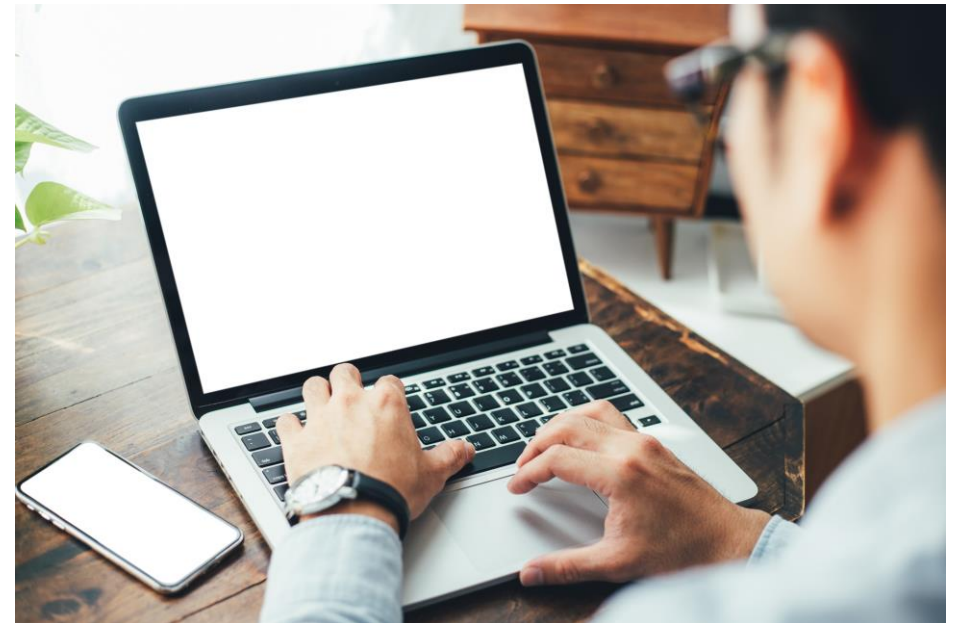
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## Free downloadable curriculum:

- Core Knowledge Language Arts, PK-6 (through CoreKnowledge.org)
- EL Education, K-8 (through OpenUpResources.org)
- Bookworms, K-5 (through OpenUpResources.org)

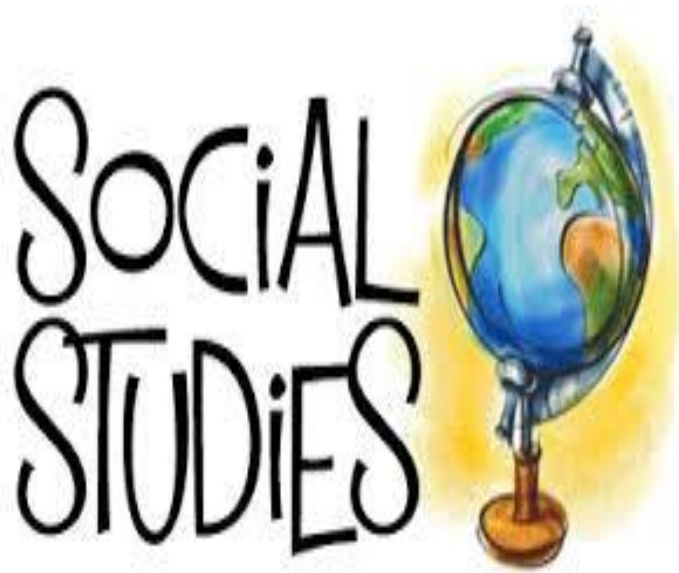
## Text sets:

- Student Achievement Partners,  
[https://achievethecore.org/category/411/ela-literacy-lessons?filter\\_cat=1112](https://achievethecore.org/category/411/ela-literacy-lessons?filter_cat=1112)
- Readworks.org
- CommonLit.org
- Newsela.com



What can administrators and policymakers do?

Adopt a content-focused elementary literacy curriculum that goes deeply into topics in ...



# How can you tell if a curriculum builds knowledge effectively?



Possible problems with literacy curricula—even some that present themselves as “content-rich”:

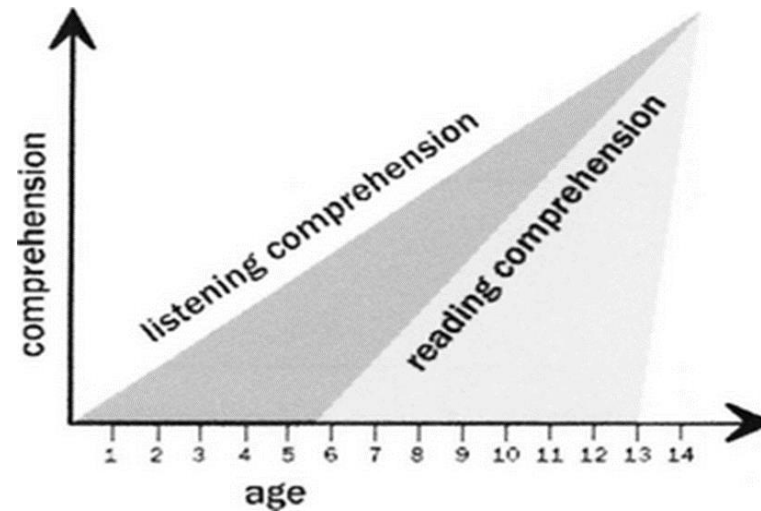
- Overstuffed/not curated
- Thin content or “themes” rather than topics
- New information introduced without enough attention to background knowledge
- Skills and strategies in the foreground rather than content
- Overreliance on leveled and/or disconnected texts
- Writing not linked to curriculum content
- Excerpts rather than whole texts
- Not enough time on foundational skills

# Different aspects of literacy impose different levels of cognitive load

Listening



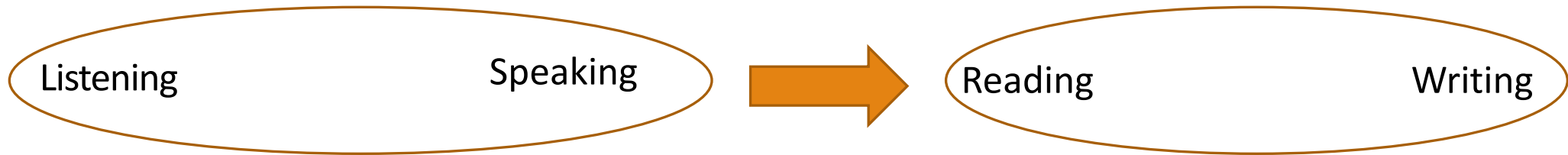
Speaking



Sticht & James 1984

Before students are fluent readers, they acquire knowledge most efficiently through LISTENING to complex text and SPEAKING about it.

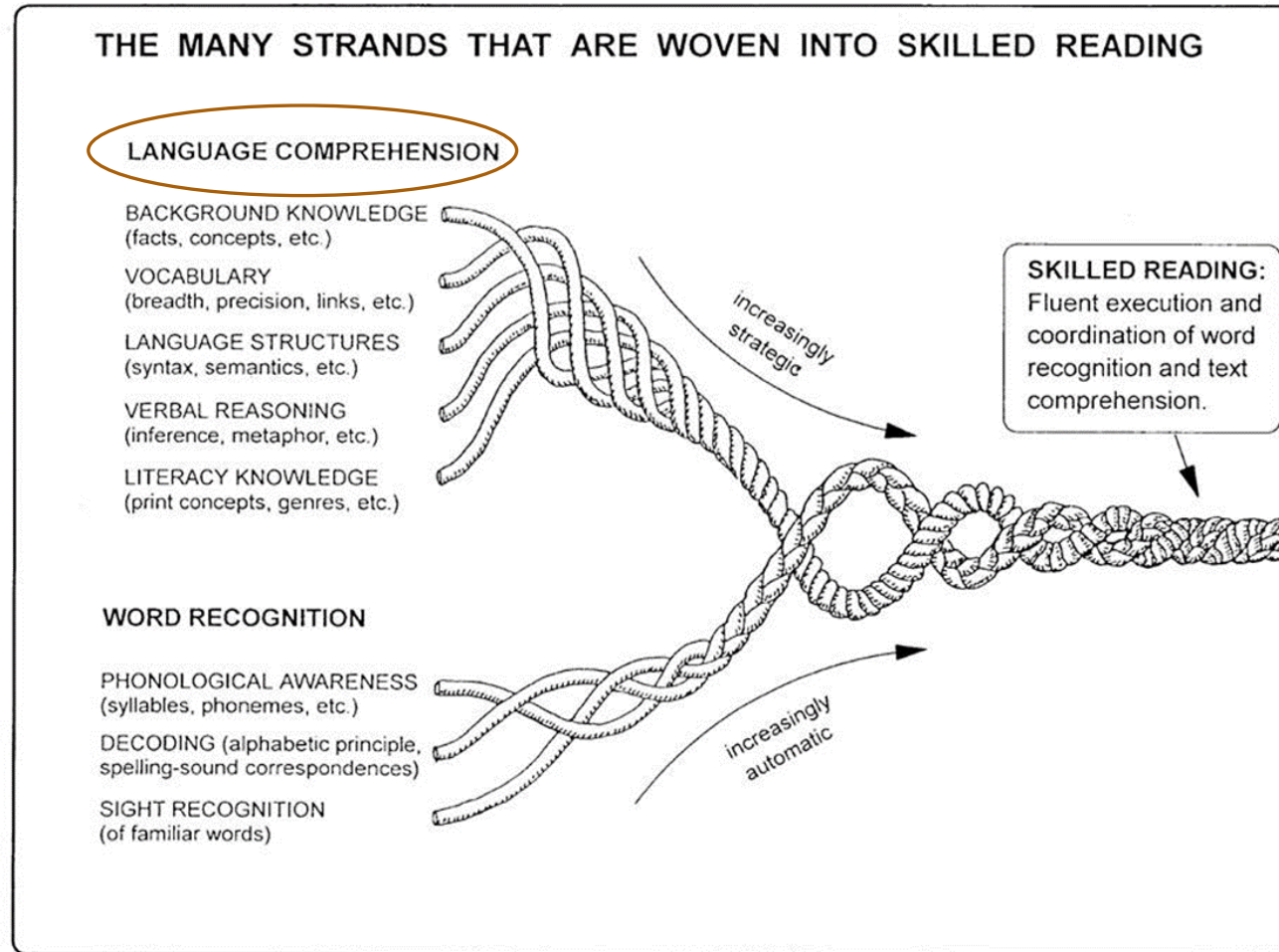
# How a knowledge-building curriculum can modulate cognitive load and boost student learning



An effective curriculum will:

- (1) focus on content & spend at least 2-3 weeks on a single topic
- (2) give all students access to the same complex text (through read-alouds & discussion)
- (3) engage students in listening, speaking, reading and writing about the SAME content.

# Let's revisit those reading infographics ...



- “Background Knowledge” and “Vocabulary” aren’t really separate “strands.”
- Activating background knowledge won’t work if students don’t have relevant knowledge.
- Quick injections of background knowledge won’t stick in long-term memory.



# The Simple View of Reading



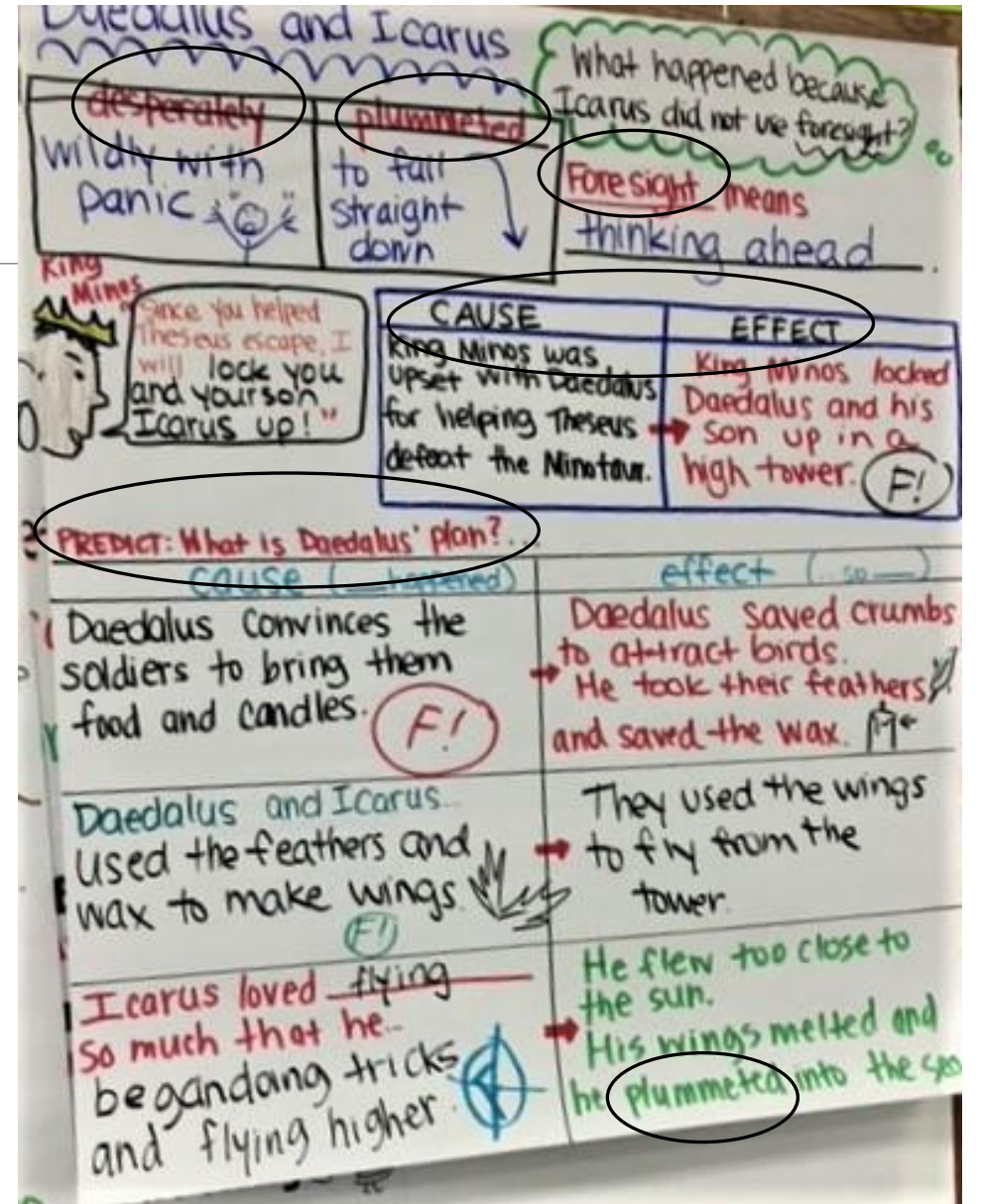
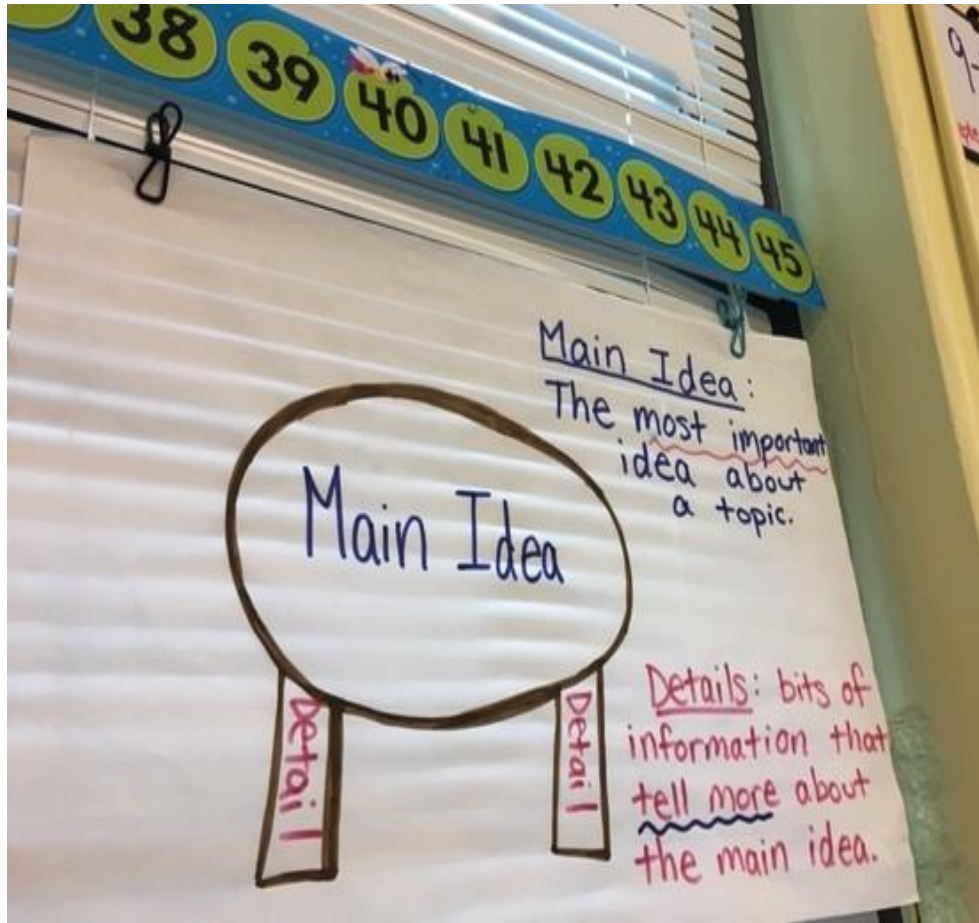
Reading comprehension doesn't depend on understanding just SPOKEN language.

Written language is more complex than spoken language.

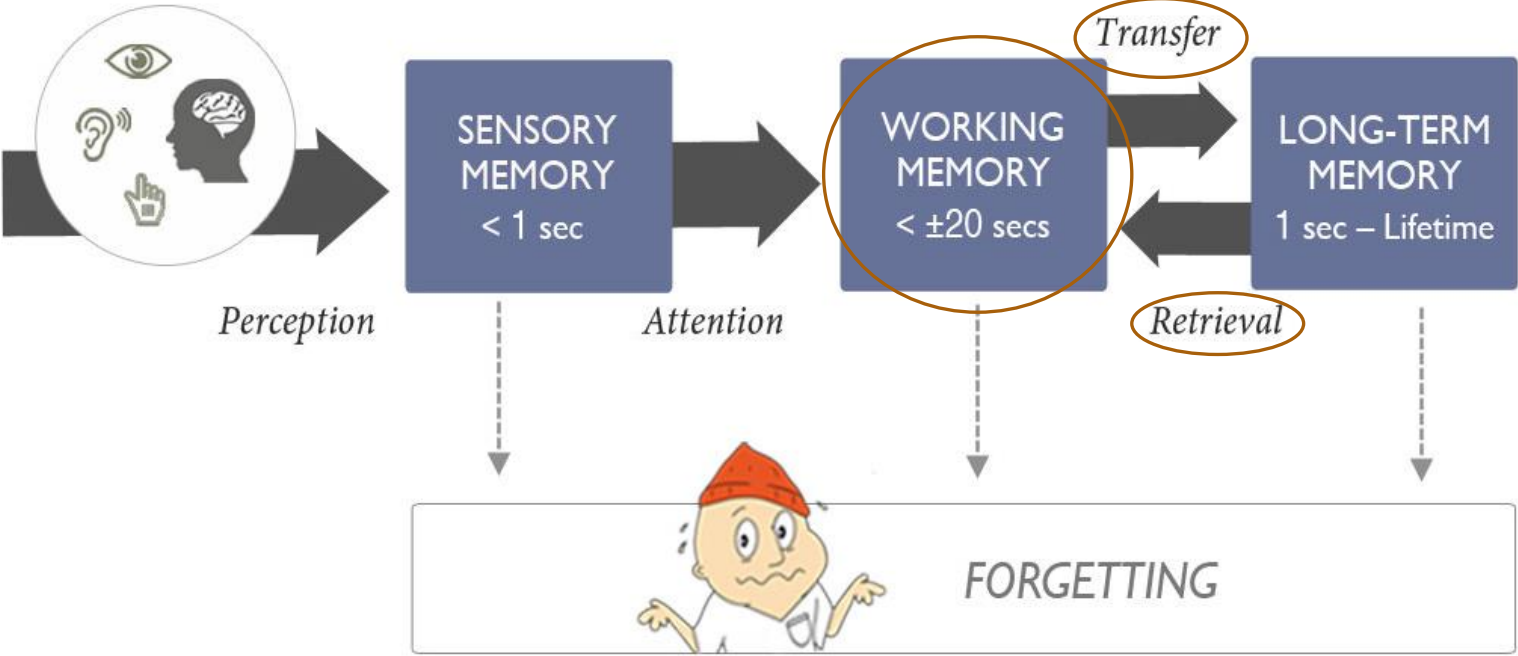


- Gives the impression that comprehension should be taught as a skill, like phonics
- Separates vocabulary from comprehension
- Omits any mention of the role of background knowledge in comprehension

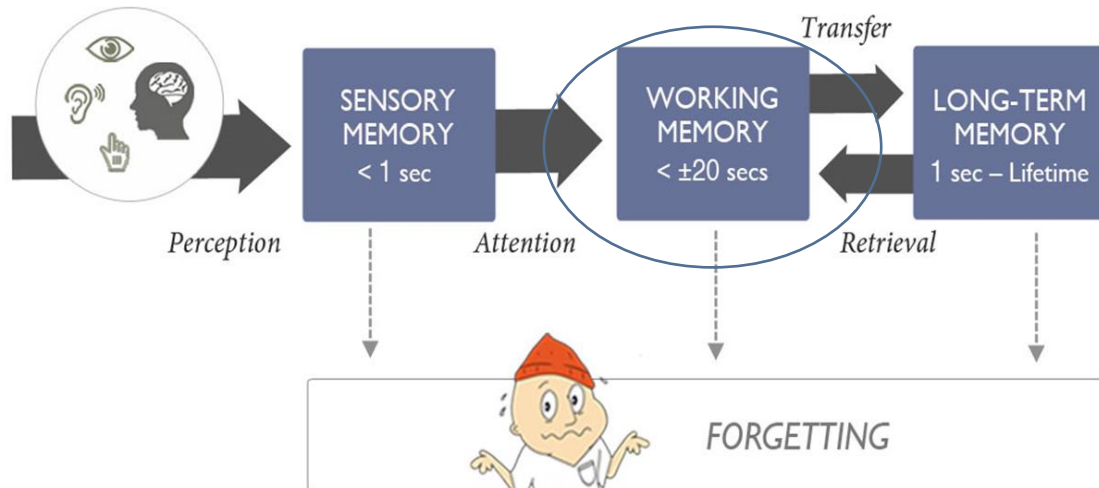
# A tale of two classrooms



# Writing can be a powerful lever for building knowledge



But it's also the hardest thing we ask students to do.



“Cognitive load” = the burden placed on working memory

Inexperienced writers may be juggling:

- Letter formation
- Spelling
- Word choice
- Organization
- Content
- The peculiar syntax & vocabulary of written language
- All of this creates “cognitive load”—and stress

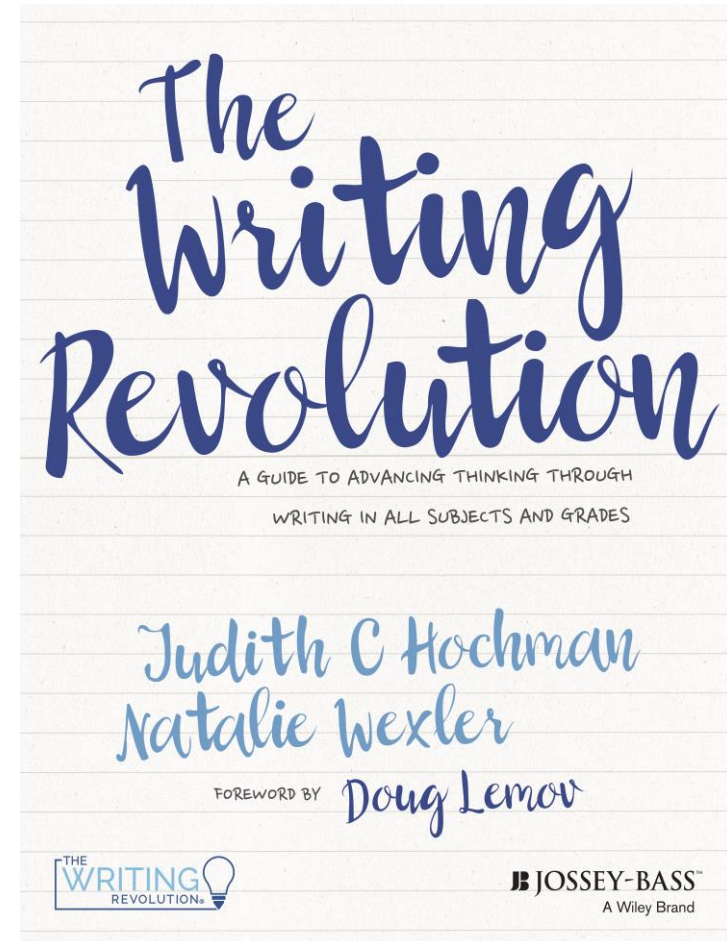
Writing instruction has enormous potential power.

BUT we have:

1. Underestimated how hard it is
2. Tried to teach it in isolation from content

To unlock the power of writing, we need to:

1. Modulate cognitive load
2. Teach grammar/conventions in the context of students' own writing
3. Embed writing activities in the content of the curriculum



# Begin at the sentence level: Sentences vs. Fragments

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1. F welcomes newcomers from faraway countries

The Statue of Liberty welcomes newcomers from faraway countries.

2. F the “mother of exiles”

The “mother of exiles,” a famous monument, holds a torch with a welcoming glow.

3. S the “mighty woman” stands in the new york harbor

The “mighty woman” stands in the New York Harbor.

## The New Colossus

BY EMMA LAZARUS

Not like the brazen giant of Greek fame,  
With conquering limbs astride from land to land;  
Here at our sea-washed, sunset gates shall stand  
A mighty woman with a torch, whose flame  
Is the imprisoned lightning, and her name  
Mother of Exiles. From her beacon-hand  
Glows world-wide welcome; her mild eyes command  
The air-bridged harbor that twin cities frame.  
“Keep, ancient lands, your storied pomp!” cries she  
With silent lips. “Give me your tired, your poor,  
Your huddled masses yearning to breathe free,  
The wretched refuse of your teeming shore.  
Send these, the homeless, tempest-tost to me,  
I lift my lamp beside the golden door!”

# Conjunctions: Because, But, and So

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Dorothy Vaughan was a computer at NASA because

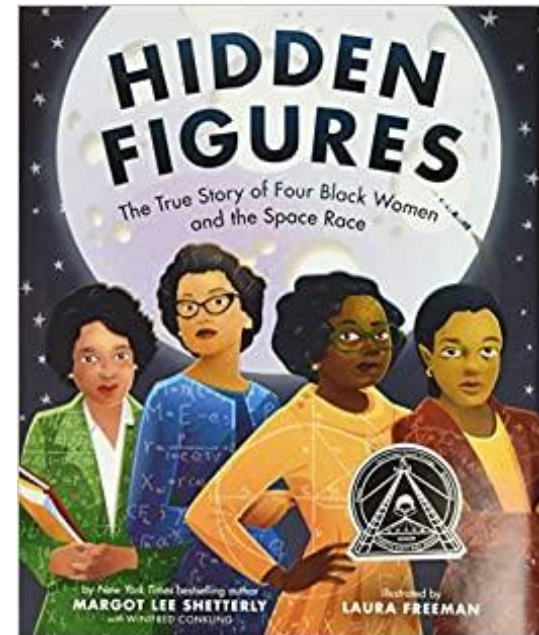
\_\_\_\_\_.

Dorothy Vaughan was a computer at NASA, but

\_\_\_\_\_.

Dorothy Vaughan was a computer at NASA, so

\_\_\_\_\_.





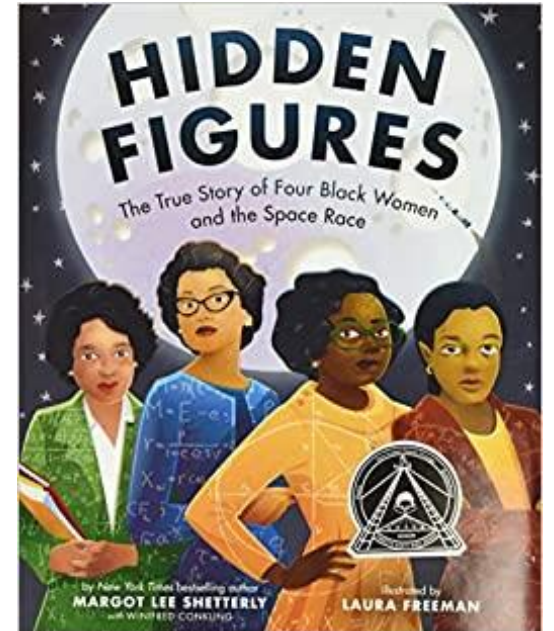
# Possible Responses

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Dorothy Vaughan was a computer at NASA because she was very good at math.

Dorothy Vaughan was a computer at NASA, but she was not allowed to use the whites-only bathrooms there.

Dorothy Vaughan was a computer at NASA, so she worked on experiments to make planes safer.



# Writing can build knowledge across the curriculum—e.g., in math

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Fractions are like decimals because they are all parts of wholes.

Fractions are like decimals, but they are written differently.

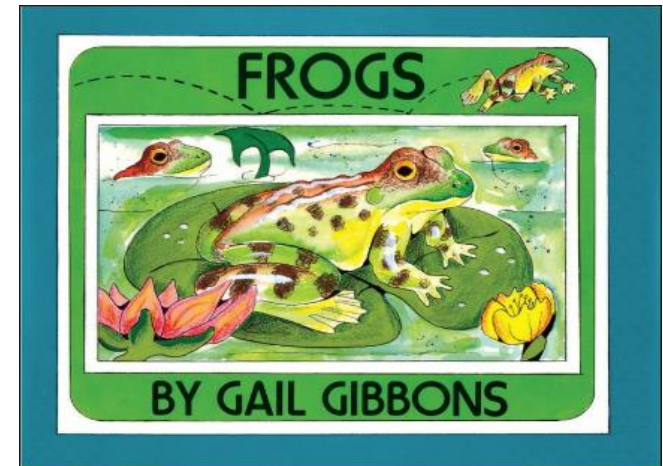
Fractions are like decimals, so they can be used interchangeably.

$$0.25 = \frac{1}{4}$$

Activities can be scaffolded for young children—  
or English language learners of any age.

Before frog embryos hatch	they eat insects and worms.
When tadpoles hatch	they eat their egg yolks.
After tadpoles become frogs	they breathe through their gills.

Before frog embryos hatch,	they eat their egg yolks.
When tadpoles hatch,	they breathe through their gills.
After tadpoles become frogs,	they eat insects and worms.



# But sentence-level work isn't just for kids

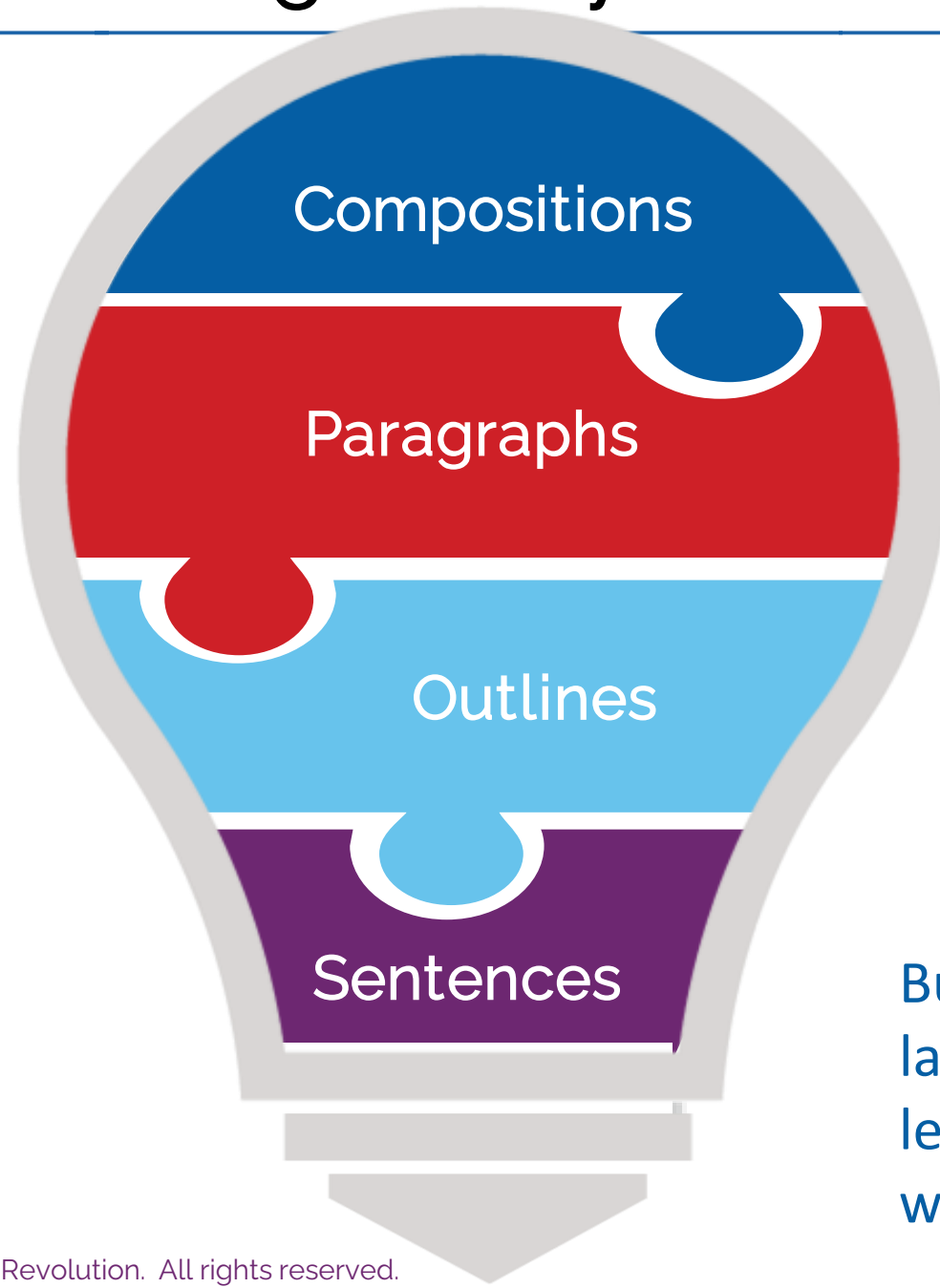
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The rigor depends on the content. Try this:

Immanuel Kant believed that space and time are subjective forms of human sensibility, but\_\_\_\_\_.



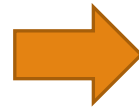
# This method goes beyond sentences



But sentence-level work lays the foundation for lengthier independent writing.

# Single-Paragraph Outline → Paragraph


- T.S. Martin Luther King Jr., a civil rights leader, fought peacefully to end segregation in America.
1. Dec. 1955/ King selected by NAACP= a civil rights organization → lead bus boycott in Montgomery, Alabama
  2. NAACP filed lawsuit/ segregation on city bus unconstitutional → 11/13/1956 U.S. Supreme Court ruled bus segregation illegal
  3. 8/28/1963 led "March on Washington" + "I Have a Dream" speech
  4. received 1964 Nobel Peace Prize/ assassinated on 4/4/1968
- C.S. Although Martin Luther King never saw segregation end, his dream came true and his legacy is honored every third January in the United States.



Martin Luther King Jr., a civil rights leader, fought peacefully to end segregation in America. In December of 1955, King was selected by the National Association for the Advancement of Colored People (NAACP), a civil rights organization, to lead a bus boycott in Montgomery, Alabama. In addition, the NAACP filed a lawsuit arguing segregation on a city bus was unconstitutional. As a result, on November 13, 1956, the U.S. Supreme Court ruled bus segregation was illegal. On August 28, 1963, King led a demonstration known as the "March on Washington" and gave his famous "I Have a Dream" speech. Furthermore, he received the 1964 Nobel Peace Prize. Sadly, King was assassinated on April 4, 1968. Although Martin Luther King never saw segregation end, his dream came true and his legacy is honored every third January in the United States.

How sentence-level activities lay the groundwork for longer writing—while building knowledge

Name Orlye Date \_\_\_\_\_



Write follow-up sentences using the transition words.

1. The colonists were angry that they had to follow English laws and pay taxes to England. **Therefore**, the colonists boycotted English goods.
2. Leaders of the American colonies held meetings in Philadelphia. **As a result**, they decided they did not need a king to rule them.
3. Thomas Jefferson was a talented writer. **Therefore**, the colonists wanted him to write the Declaration of Independence.
4. On July 4, 1776, the leaders signed the Declaration of Independence. **Consequently**, the thirteen colonies became the United States of America.

# The better way to teach strategies: explicit writing instruction

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- Finding the main idea and supporting details
- Making inferences
- Comparing and contrasting
- Etc.

Why is it better?

- The content is necessarily in the foreground.
- You can tell if students are “getting it.”
- You’re reaching EVERY student.





Effective writing instruction can turbocharge any content-rich curriculum.

# COMPREHENSION

## strategies vs. skills

- Using Schema
- Predicting
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- Main Idea & Details
- Author's Purpose
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READ TO COMPREHEND

But if the curriculum is focused on comprehension skills, it won't work.

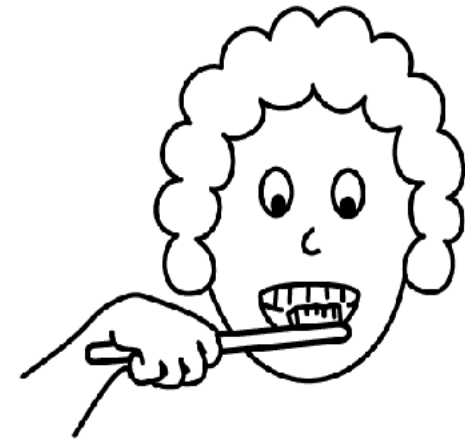
Curriculum is  
the place to  
start ... but it's  
not enough.





One big  
potential  
obstacle to  
change:  
testing

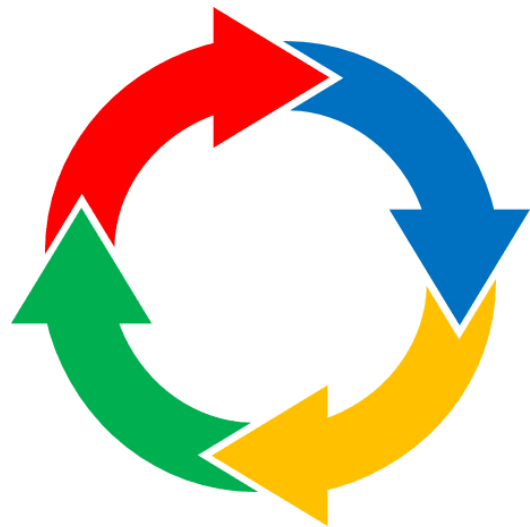
# Other possible obstacles



# To Be Effective, PD Should Be Rooted in the Content of the Curriculum ...

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Be ongoing and cyclical ...

And enable teachers to understand not just HOW to change their practice but also WHY it's important.





# The Power of Knowledge- Building Curriculum

# To sum up ...

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- Reading comprehension depends more on **background knowledge and academic vocabulary** than comprehension “skills.”
- Students who start out with less academic knowledge fall farther behind **every year** if they’re not acquiring it.
- To build knowledge, schools need to adopt **content-rich curriculum** that begins in kindergarten and **integrates listening, speaking, reading, and writing**.
- To ensure the curriculum is implemented well, schools need to provide **ongoing support grounded in specific content**.
- A knowledge-building approach, combined with effective foundational skills instruction, can enable ALL children to reach their full potential and meet or **exceed** high expectations.
- Thank you!
- Questions? (You can also contact me through [nataliewexler.com](http://nataliewexler.com).)

