

# **Science of Reading: Knowledge & Vocabulary**

Session 2 of 4 in the Science of Reading

December 2020

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**Meet the TNTP Team**

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## Our Goal:

Participants will continue to explore what cognitive science tells us about how students learn to read.



## Participants will walk away understanding:

- the value of exposing young students to **complex content and ideas**
- the role **content knowledge** plays in reading comprehension
- how **word learning** is most efficient when students understand context
- how **leveled reading** can create inequities

# Agenda

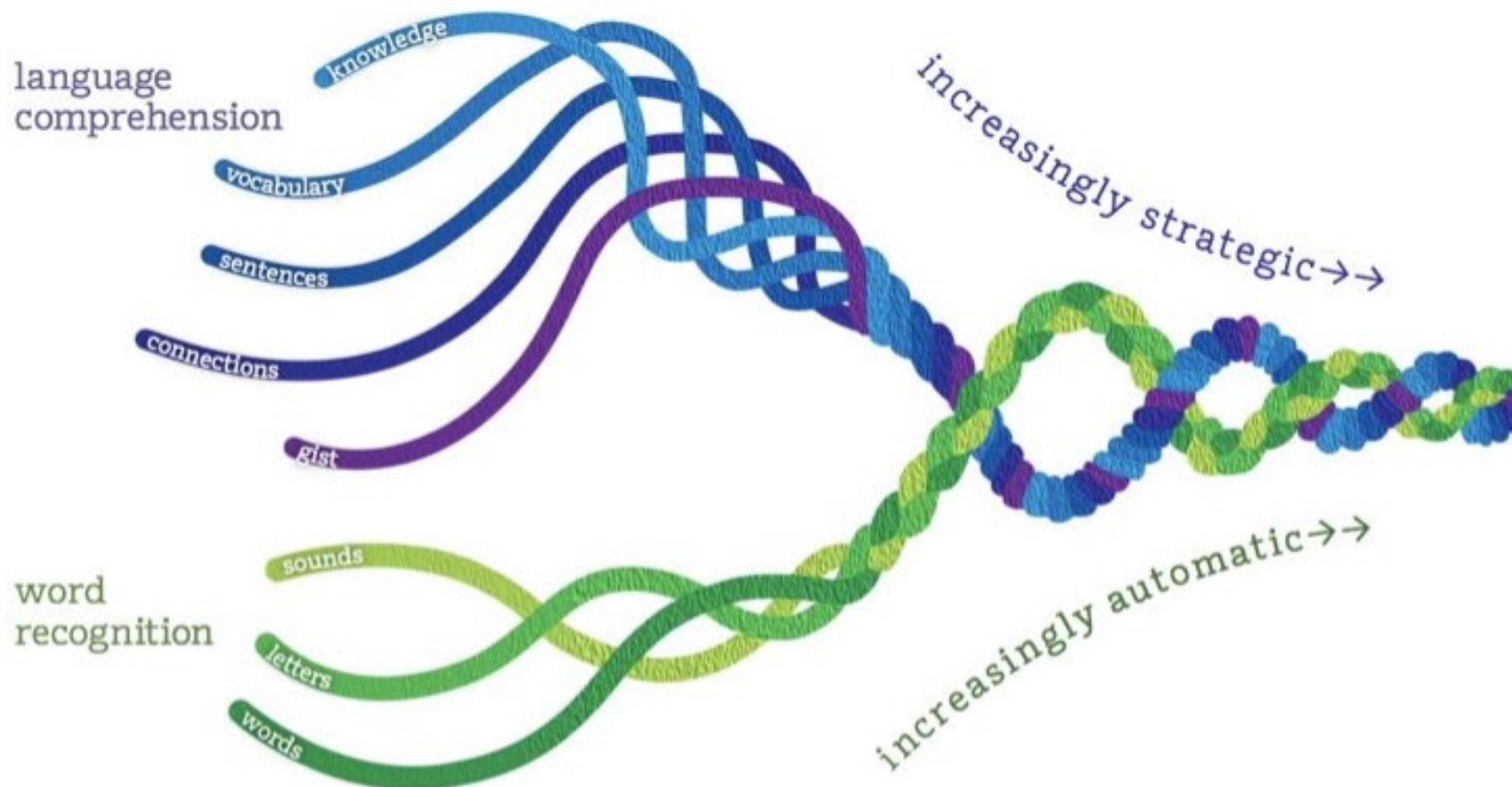
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## Knowledge-Building & Equity

Academic Vocabulary

Implications for Literacy Instruction

# How We Learn to Read: Building on Session 1



# Reflect

## EDUCATION

# Elementary Education Has Gone Terribly Wrong

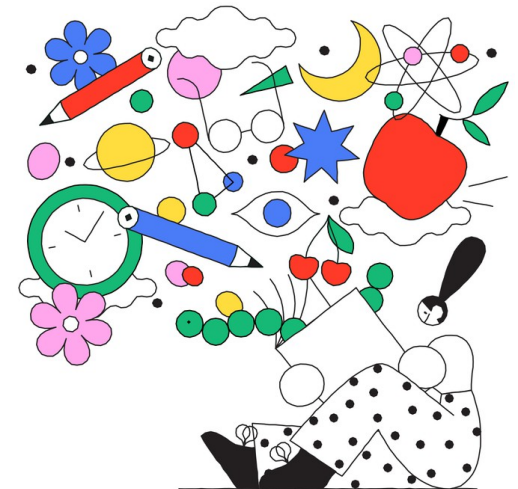
In the early grades, U.S. schools value reading-comprehension skills over knowledge. The results are devastating, especially for poor kids.

NATALIE WEXLER AUGUST 2019 ISSUE

*"What if the medicine we have been prescribing is only making matters worse, particularly for poor children?  
**What if the best way to boost reading comprehension is not to drill kids on discrete skills but to teach them, as early as possible, the very things we've marginalized**—including history, science, and other content that could build the knowledge and vocabulary they need to understand both written texts and the world around them?"*

Why might making the shift to building knowledge be important?

Why can it be such a difficult shift for districts, schools, and teachers to make?





## The effect of knowledge on reading comprehension is strong

General cultural knowledge correlates about .50 with reading comprehension test scores. That's about the same correlation between parents' heights and their kids' heights



# Knowledge Matters



## KNOWLEDGE MATTERS

Abril's Class

2nd Grade

Westergard Elementary School in Reno, NV



What are your first impressions of this classroom?  
What are students learning? Who is engaged?  
How are 2nd graders able to tackle complex texts and ideas?



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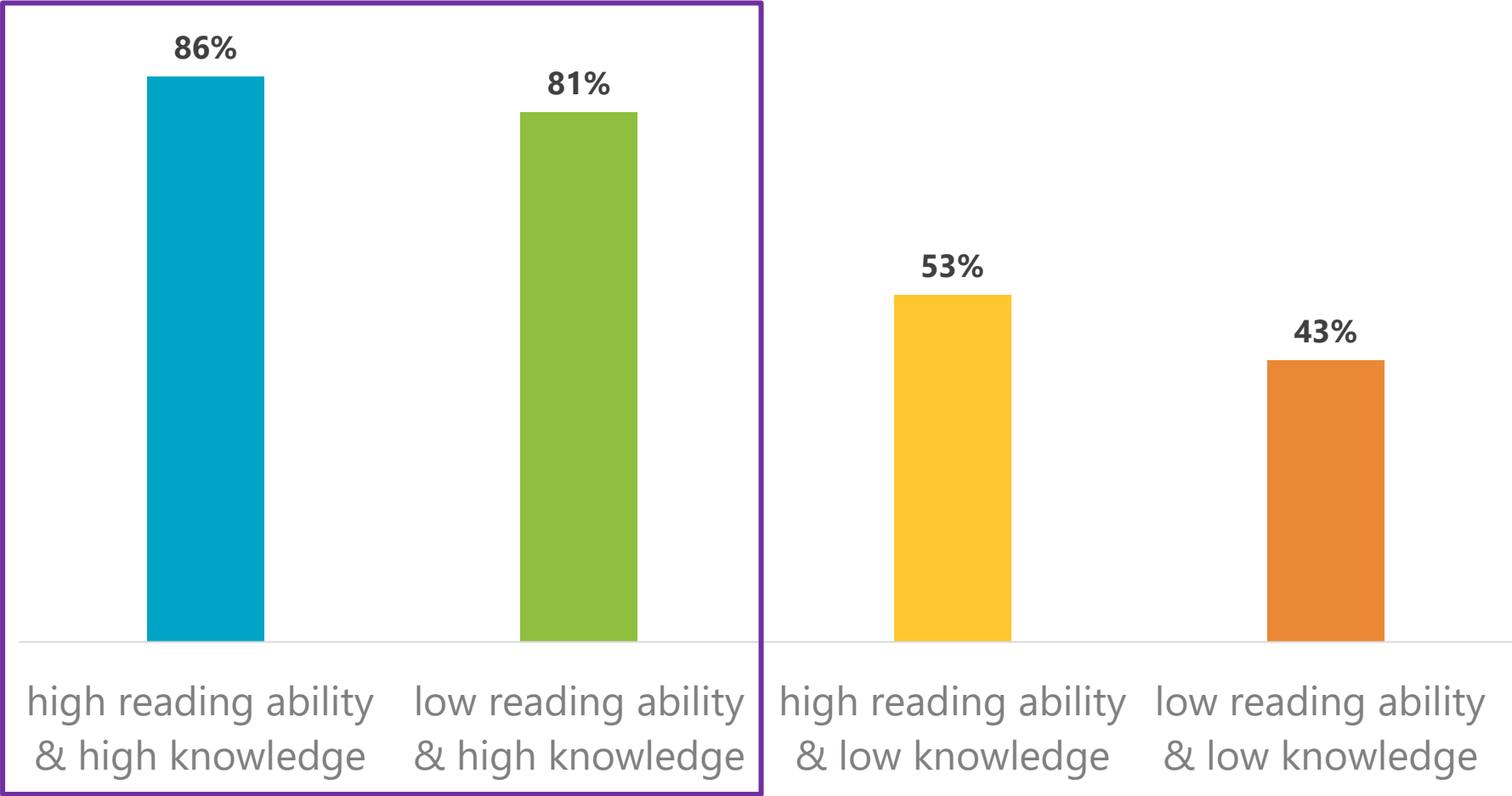
# How big of a role does knowledge and the associated vocabulary play in comprehension?

## Recht & Leslie (1988) Compared Reading Comprehension for Four Categories of Students

<b>High</b> reading ability <b>High</b> knowledge of baseball	<b>High</b> reading ability <b>Low</b> knowledge of baseball
<b>Low</b> reading ability <b>High</b> knowledge of baseball	<b>Low</b> reading ability <b>Low</b> knowledge of baseball

**Knowledge of the topic had a much bigger impact on comprehension than generalized reading ability did.**

Measure of Comprehension



## A student's knowledge is often impacted by their socioeconomic status.

In 2014, a study on background knowledge tested Pre-K students' comprehension on texts about birds and found significant gaps between lower and higher SES students in their comprehension.



**When those same students were given texts about a fictional species called wugs, those gaps in comprehension disappeared.**

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# How Knowledge Helps

**Knowledge helps readers make inferences and resolve ambiguity.**

## **Making Inferences:**

*John's face fell as he looked down at his protruding belly. The invitation specified 'black tie' and he hadn't worn his tux since his own wedding, 20 years earlier.*

## **Resolving Ambiguity:**

*John walked down the steps with care. Jeanine looked him up and down while she waited. Finally she said, 'Well, I'm glad I've got some fish in my purse.'*

**Knowledge also helps readers free up working memory by chunking information**

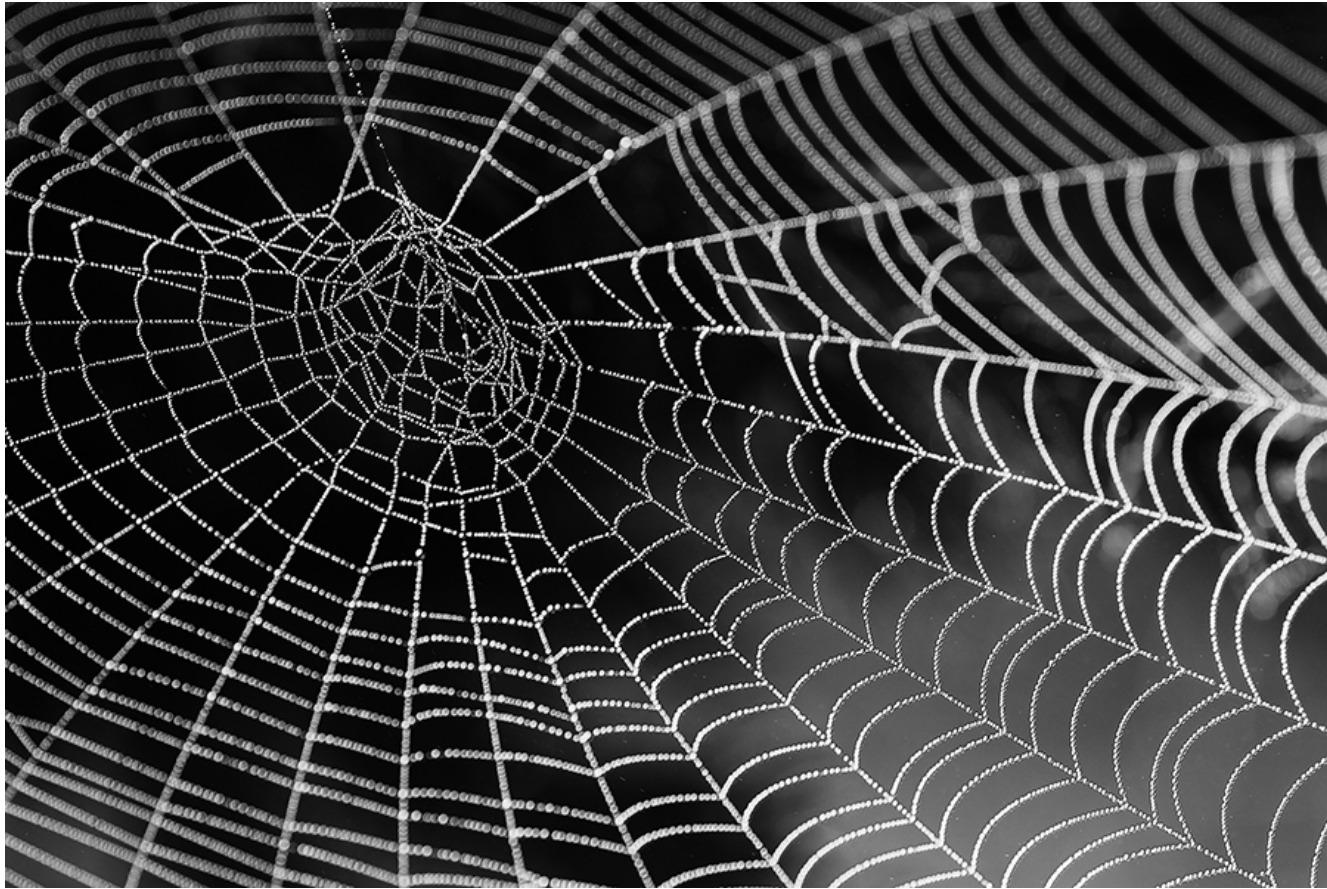
Word List 1
NFB
ICB
SCT
ANC
BDS

Word List 2
CNN
CBS
FBI
CIA
NCAA



What are the implications of  
this on reading and  
storing/processing  
information?

## Knowledge Builds Schema



**Any topic that you've built a strong schema around is much more likely to 'catch' similar, applicable knowledge.**

**What is the connection  
between knowledge-building  
and equity?**

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# Agenda

Knowledge-Building & Equity

**Academic Vocabulary**

Implications for Literacy Instruction

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## Academic Vocabulary

*"Robust **academic language** gives students access to complex texts and allows them to write and communicate with precision. The things we know have to be named and described by words when encountered in print." (Adams, 2011)*

*"Building knowledge and **domain-specific vocabulary** play an essential role in the literacy development of students. To build this essential knowledge and vocabulary, students must read, analyze, discuss, and write about a range of conceptually coherent topics." (Cervetti et al., 2016; Landauer & Dumais, 1997)*

-20-21 Nebraska Essential Instructional Content ELA

## How is vocabulary a barrier to comprehension?

When she was twenty-six, Eliza bought tickets to \_\_\_\_\_. Few \_\_\_\_\_ had ever been there. Eliza wrote \_\_\_\_\_ for the \_\_\_\_\_ back home. She loved sharing the \_\_\_\_\_ things she saw, such as \_\_\_\_\_ and the \_\_\_\_\_. Eliza even wrote a book – the first \_\_\_\_\_ about \_\_\_\_\_.

When Eliza went back to \_\_\_\_\_, it wasn't long before she started thinking about \_\_\_\_\_ again. She decided to visit her older brother, who was working in \_\_\_\_\_. Eliza \_\_\_\_\_ across the ocean.

**What do you learn about Eliza from the first paragraph?**  
**What is special about the book Eliza wrote?**  
**What is the main idea of the passage?**



**What is the main idea of  
this passage?**

## What's the main idea of this passage?

When she was twenty-six, Eliza bought tickets to **faraway Alaska**. Few **tourists** had ever been there. Eliza wrote **reports** for the **newspapers** back home. She loved sharing the **fascinating** things she saw, such as **huge glaciers, spouting whales**, and the **native people**. Eliza even wrote a book – the first **guidebook** about **Alaska**.

When Eliza went back to **Washington**, it wasn't long before she started thinking about **traveling** again. She decided to visit her older brother, who was working in **Japan**. Eliza **sailed** across the ocean.

## What is the main idea of the passage?

How did it feel for you to read this passage and answer these questions with and without the vocabulary?

How do you think it would feel for your students?

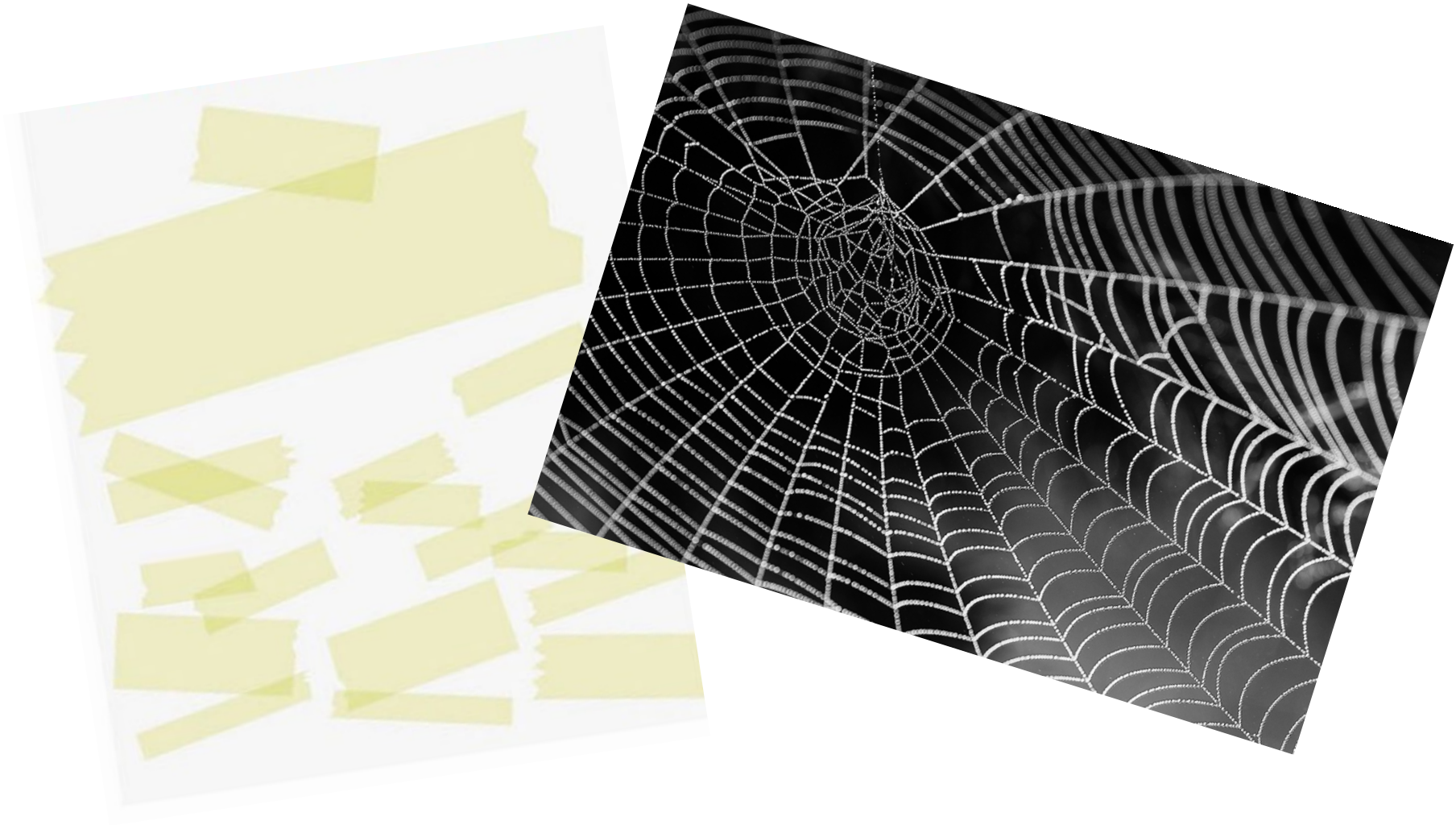
What are the implications for reading instruction?

## Knowledge helps build vocabulary



Reading or listening to a series of text on the same topic can yield as much as **four times the vocabulary growth.** (Landauer and Dumais, 1997)

**The stronger the schema, the more likely new vocabulary is to “stick”**



# Three Tiers of Vocabulary



## Tier 3 (Domain Specific) Words

*lava, circumference, legislature*

## Tier 2 (Academic) Words

*saunter, vary, relative*

## Tier 1 (Basic) Words

*book, girl, fruit*



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**If you knew the Tier 2 words, but not the Tier 3, would you be better equipped to understand the passage?**

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Knowledge-Building & Equity

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**Implications for Literacy Instruction**

## So, what are the implications for K-2 literacy instruction?

Expose even your youngest students to complex content and ideas by **elevating** subjects like science and social studies

Leverage texts across disciplines to develop knowledge students can use to **"chunk"** information

Use texts to **deepen** knowledge of a topic or theme within a unit of study rather than covering a broad variety of topics

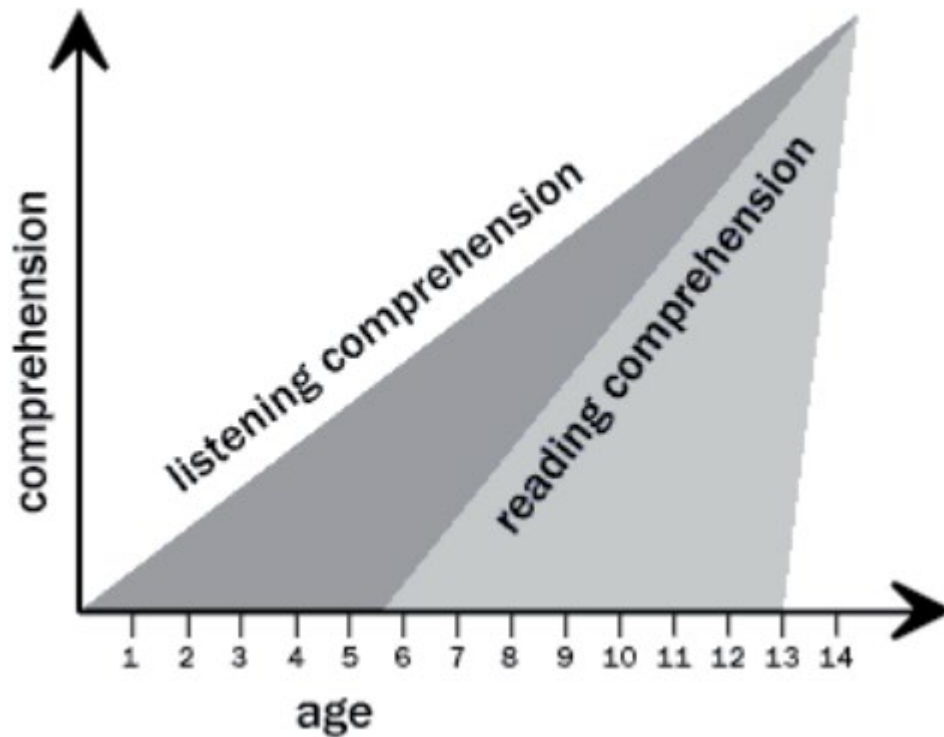
**Starting with a standard and picking a text to "teach" to that standard.**



**Starting with a complex text and using the standards in service of understanding the deeper meaning of that text or topic.**

**In the early grades, read-alouds of high-quality, complex texts help students grow their knowledge of the world, vocabulary, and oral language skills while they develop the skills to access complex text independently.**

### Listening and Reading Comprehension, by Age



“Teachers can read aloud to build students’ knowledge of the world beyond their scope and to help students make connections from the known to the new. There is likely no better way to draw children in to the treasures stored in the written word than through reading aloud to them as much as possible.”

— David Liben, Senior Content Specialist of the Literacy and English Language Arts team, Student Achievement Partners

## Two Approaches Using Non-Fiction Texts in a 2<sup>nd</sup> Grade Class

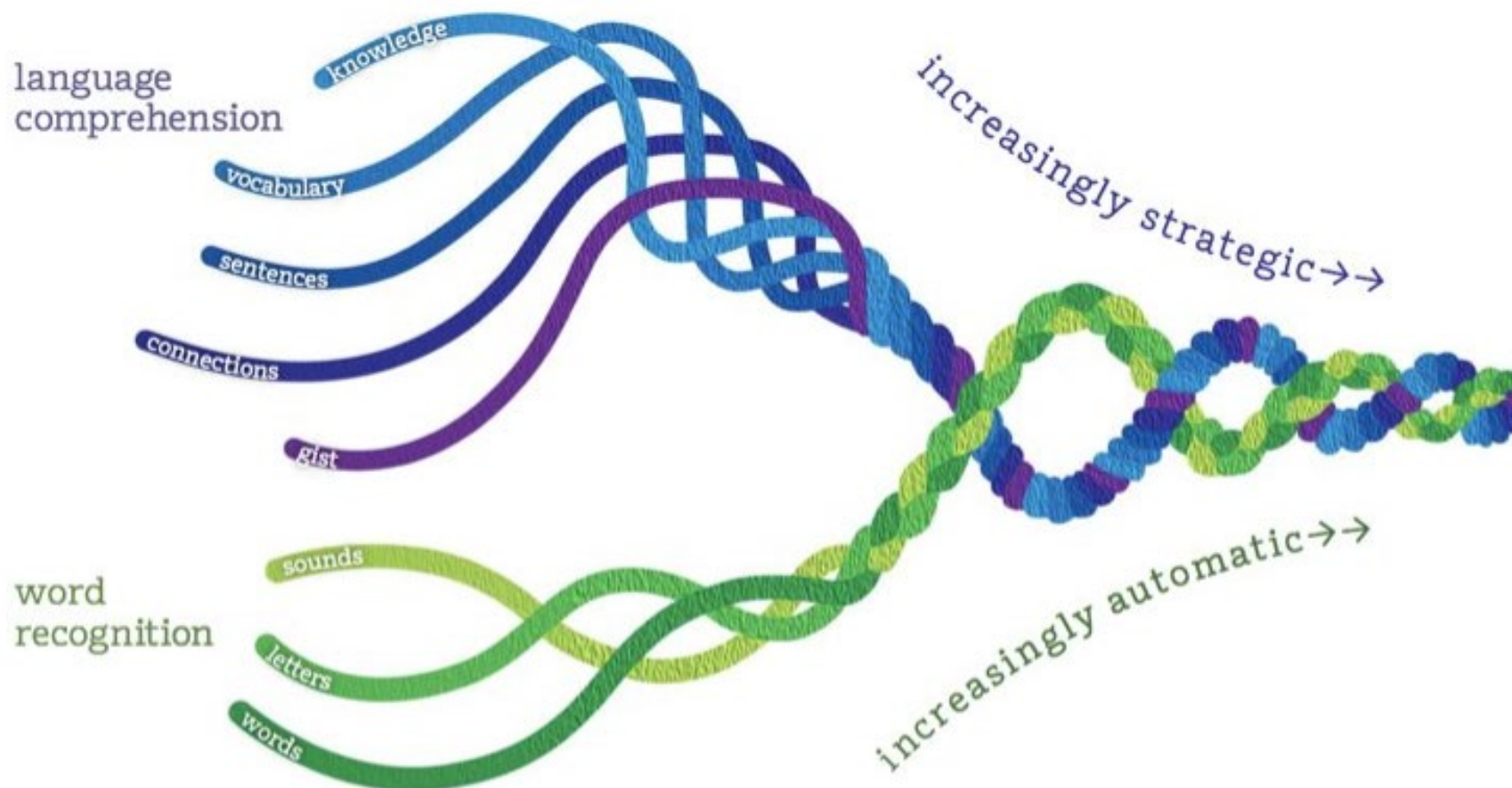
Skills-Focused Literacy Classrooms	Knowledge-Building Literacy Classrooms
<ul style="list-style-type: none"><li>• The teacher teaches a mini-lesson on captions and how they help students understand the pictures they accompany, including a think aloud of the connections she makes in her mind when she encounters a caption.</li><li>• Students choose non-fiction books at their level, and complete a graphic organizer as they read, identifying each caption they encounter, and what they explain about the picture.</li></ul>	<ul style="list-style-type: none"><li>• The teacher conducts a read-aloud on a book about orcas. Throughout the read aloud, she pauses and asks questions about what they have learned about orcas during the reading. When she encounters a caption, she briefly explains what the structure is, and that it explains a picture, then asks what the picture and caption help the students understand about whales.</li><li>• Students read non-fiction books about other types of whales, completing a graphic organizer helps them capture key facts about the animals as they read. They will include these facts in a writing exercise later in the lesson arc.</li></ul>



How do each of these lessons  
incorporate the skill of the  
standard?

How would engagement  
differ in these two lesson  
approaches?

## In a 2<sup>nd</sup> grade lesson that focuses on non-fiction text...



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**Knowledge matters, and there's no excuse for not building it in our classrooms.**

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"If kids are going to spend the next three days reading and rereading a selection about Martin Luther King or why empathy matters or about children in Brazil—studying the vocabulary, answering questions, practicing fluency—there is no excuse for them walking away from those lessons not knowing who the Reverend King was, what empathy means, or where Brazil is. **Reading lessons needs to have double outcomes: an improvement to reading ability and an increased knowledge about whatever was read.**"

--Dr. Timothy Shanahan, Literacy Researcher

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What is one key learning that you will apply to your work?

What wonderings do you still have about building knowledge and vocabulary through text?

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