

Disciplinary Literacy in New Mexico

A Guide for Secondary Educators



Teaching, Learning, and Innovation
Division of Curriculum and Instruction
Literacy and Humanities Bureau

Table of Contents

Section	Page Number
<u>What is Disciplinary Literacy?</u>	1
<u>Writing Across Disciplines</u>	6
<u>Literacy Practices for ELA</u>	7
<u>Disciplinary Literacy in Math</u>	10
<u>Disciplinary Literacy in History</u>	12
<u>Disciplinary Literacy in Science</u>	14
<u>References</u>	16

What is Disciplinary Literacy?

NM PED Disciplinary Literacy Definition

Disciplinary literacy is the ability to think, read, write, and communicate in ways that align with the unique practices of a discipline. It recognizes that different subjects—such as mathematics, history, and science—require distinct strategies for engagement. In culturally responsive classrooms, secondary educators bridge students' cultural backgrounds with disciplinary learning by incorporating diverse cultural perspectives and languages and enriching students' disciplinary knowledge by recognizing their lived experiences as valuable for interpreting academic texts and solving problems within the discipline (Fang, 2012; Goldman et al., 2016). Disciplinary literacy includes how secondary educators use disciplinary texts along with comprehension strategy instruction to enhance understanding of the content-specific text and support students in accessing more advanced coursework within the subject area (Shanahan & Shanahan, 2008).

Disciplinary literacy is not...

“All teachers are teachers of reading.”

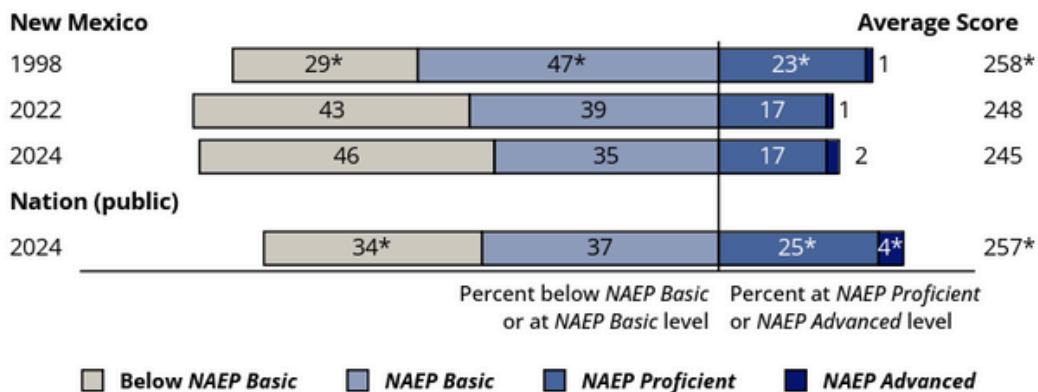
Content area literacy vs. Disciplinary literacy

Content area literacy focuses on general study strategies to comprehend and retain subject-specific texts, while disciplinary literacy highlights the unique methods experts use to create, communicate, and analyze knowledge within their fields. Unlike content literacy, which assumes uniform cognitive strategies across subjects, disciplinary literacy recognizes the distinct purposes, genres, and communication styles of each discipline. For example, paraphrasing may aid understanding broadly but lacks discipline-specific relevance. Research increasingly shows that disciplines differ fundamentally in their language, conventions, and evaluative criteria (Shanahan & Shanahan, 2012).

2024 READING STATE SNAPSHOT REPORT

NEW MEXICO ■ GRADE 8 ■ PUBLIC SCHOOLS

NAEP ACHIEVEMENT-LEVEL PERCENTAGES AND AVERAGE SCORE RESULTS



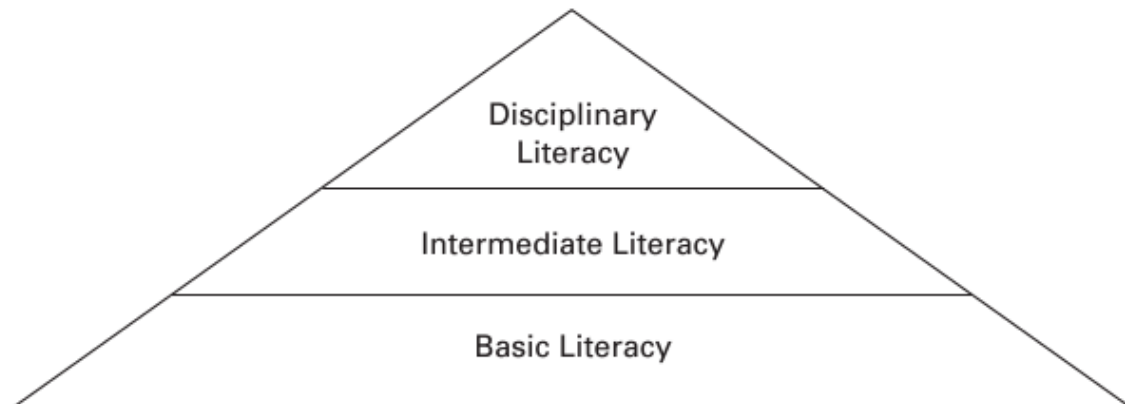
What data are telling us

The National Assessment of Educational Progress (NAEP, 2024) data shows that 19% of NM 8th graders are reading at or above proficiency. This included 46% of 8th grade students scoring below basic in reading. This data suggests that the achievement gap is widening. In 2024, nationally, 29% of 8th graders were at or above proficiency in reading and 34% nationally below basic.

Literacy as a Social Issue

Studies show that individuals with limited literacy skills are disproportionately represented in the incarcerated population. According to a report from the National Center for Education Statistics (NCES, 2007), nearly 70% of incarcerated individuals in the United States score at the lowest levels of literacy, significantly hindering their ability to understand legal proceedings, access rehabilitation programs, or secure stable employment upon release. However, literacy programs in correctional facilities have been shown to reduce recidivism. A meta-analysis by the RAND Corporation (Davis et al., 2013) found that inmates who participated in educational programs, including literacy development, were 43% less likely to return to prison than those who did not. These programs equip individuals with the skills needed to reintegrate into society successfully, including navigating job applications, understanding contracts, and engaging with civic responsibilities.

FIGURE 1 *The Increasing Specialization of Literacy Development*



(Shanahan & Shanahan, 2008)

Three Levels of Literacy

Basic Literacy:

- Involves foundational reading skills like decoding and recognizing high-frequency words.
- Supports virtually all reading tasks and is typically mastered in primary grades.

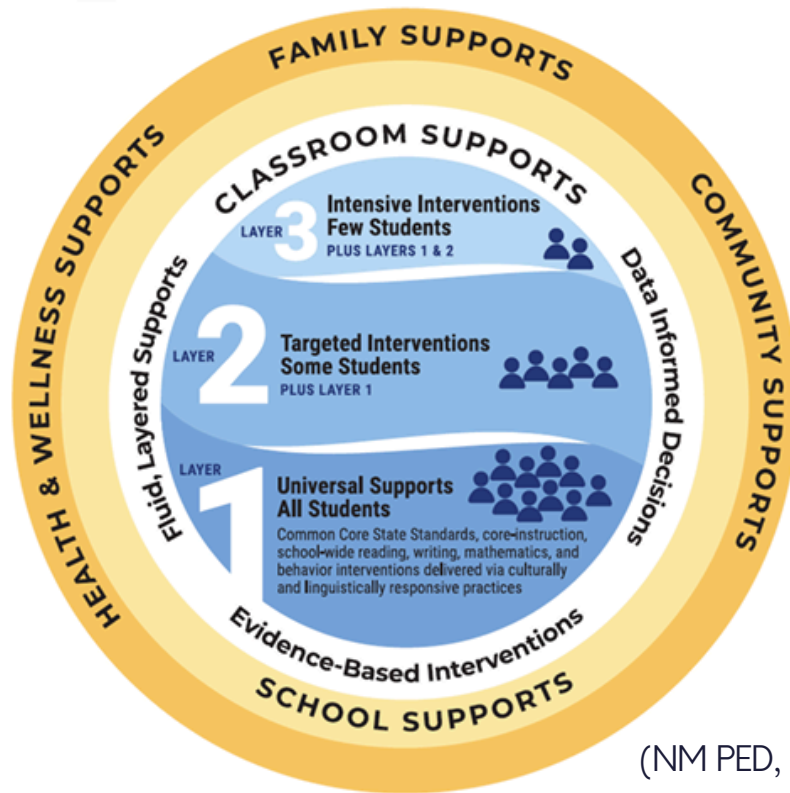
Intermediate Literacy:

- Covers general comprehension strategies, fluency, and understanding of less common vocabulary and text structures.
- Includes skills like paraphrasing, interpreting punctuation, and recognizing organizational patterns.
- Mastery occurs by late middle school for most students.

Disciplinary Literacy:

- Focuses on advanced, subject-specific reading and communication strategies.
- Reflects the specialized conventions and methods used in disciplines like science, math, or history.
- Skills are less generalizable and often not taught explicitly in secondary education, though it should be.

(Shanahan & Shanahan, 2008)



(NM PED, 2021)

Multi-Layered Systems of Support Layers of Instruction

Layer 1:

- **Disciplinary Literacy:** Reading strategies that are specialized and unique to subject areas, provided with scaffolds and supports to ensure access to materials for all students.
- **Intermediate (Content) Literacy:** Strategies for vocabulary, comprehension, and writing used within all subject areas, provided with scaffolds and supports to ensure access to materials for all students.

Layers 2 & 3:

- **Basic Literacy:** Taught as interventions to close foundational skill gaps in decoding or word study, as well as fluency, vocabulary, comprehension and writing.

(Sedita, 2021)

Each discipline has unique methods for creating, communicating, and evaluating knowledge, which are reflected in their literacy practices. Below, you will find a summary of teaching practices for math, science, history, and literature, as shared by Shanahan (2015). Implementing these discipline-specific teaching practices can enhance students' comprehension and engagement by aligning learning strategies with the authentic practices of each field.

Mathematics

- **Precision and Logic:** Emphasize the importance of precise definitions, logical reasoning, and the structured progression of ideas.
- **Symbolic Representation:** Teach students to interpret and use mathematical symbols and notations accurately.
- **Problem-Solving Strategies:** Encourage multiple approaches to solving problems and the ability to justify solutions.

Science

- **Empirical Evidence:** Focus on understanding and evaluating data, experiments, and observational studies.
- **Scientific Method:** Teach the processes of hypothesizing, experimenting, observing, and concluding.
- **Technical Vocabulary:** Develop students' understanding of specialized terminology used in scientific contexts.

History

- **Source Analysis:** Instruct students on how to analyze primary and secondary sources, considering authorship, context, and perspective.
- **Chronological Reasoning:** Teach the ability to understand and construct timelines and the cause-and-effect relationships between historical events.
- **Argumentation:** Encourage the development of coherent historical arguments supported by evidence.

Literature

- **Critical Analysis:** Guide students in interpreting themes, motifs, and literary devices within texts.
- **Contextual Understanding:** Teach the importance of historical, cultural, and biographical contexts in interpreting literature.
- **Comparative Reading:** Encourage comparing and contrasting different texts and genres to deepen understanding.

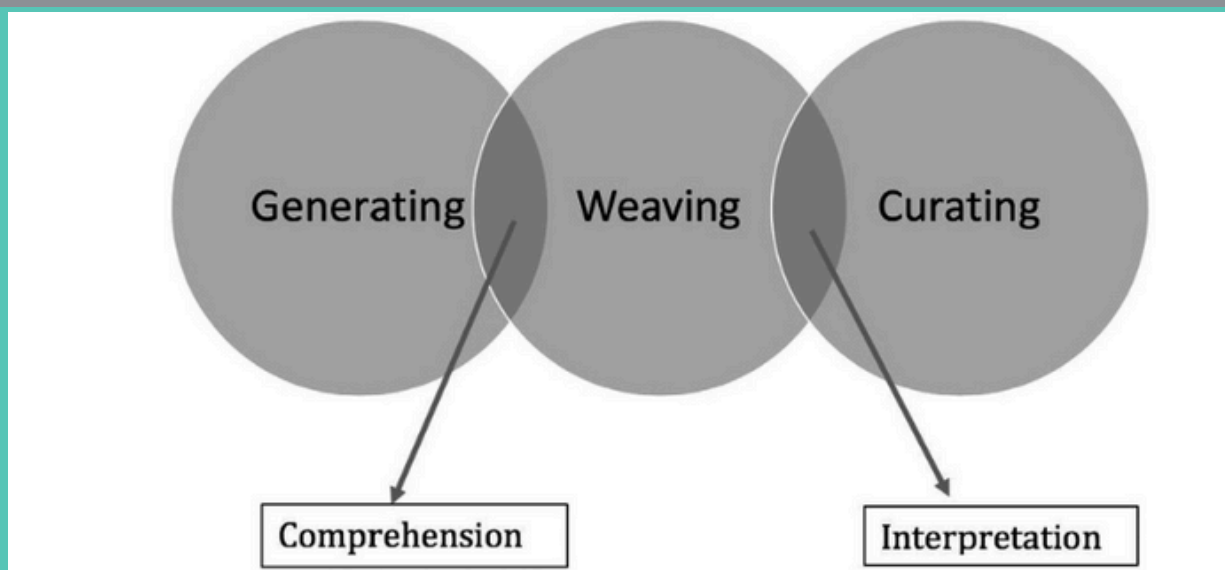
How Writing Supports Disciplinary Literacy

Although reading and writing are complementary, they are not synonymous. Many adolescents who are proficient readers struggle significantly with writing. Improving reading does not necessarily improve writing (Biancarosa & Snow, 2004). A significant portion of students perform poorly in writing, with 70% of 4th–12th graders identified as low-achieving writers (Persky et al., 2003). Only a small percentage of students score proficient or advanced on the NAEP writing exam. Many students do not meet readiness benchmarks for college-level writing, with a quarter of community college students requiring remedial writing courses (National Center for Education Statistics, 2003). Writing skills are critical for both professional and academic success. Employers report that writing proficiency affects hiring and promotion decisions, and companies spend billions annually on remediation (National Commission on Writing, 2004). Writing is essential not only for academic success but also for functioning in the workplace and daily life. Instruction should target both the development of writing as a skill and as a tool for learning subject matter.

Key Strategies for Writing Instruction

- **Writing Strategies:** Teach students strategies for planning, drafting, and revising.
- **Summarization:** Incorporate summarizing exercises to enhance comprehension and writing.
- **Collaborative Writing:** Encourage students to work together on writing tasks.
- **Specific Product Goals:** Set clear and specific writing goals.
- **Word Processing:** Use technology, especially word processing, to support writing.
- **Sentence Combining:** Teach students to combine sentences to improve complexity.
- **Prewriting:** Promote activities that organize thoughts before writing.
- **Inquiry Activities:** Use research-based activities to stimulate writing.
- **Writing to Learn:** Incorporate writing in other subjects to help learning.
- **Feedback:** Provide regular feedback on students' writing.
- **Time for Writing:** Ensure students have dedicated time to write regularly.

What Expert Readers Do When Reading Literary Texts



Generating involves recognizing patterns, using familiar strategies, noticing unfamiliar elements, and beginning to make sense of the text

Curating involves selecting, revisiting, and refining ideas to transform text into advanced interpretations, setting experts apart from novices.

Weaving combines background knowledge and textual information, forming connections and hypotheses about meaning.

(Reynolds et al., 2020)

What does this look like in a secondary classroom?

- **Encourage Pattern Recognition:** Guide students to notice text patterns (e.g., word choice, punctuation) and use them as entry points for generating ideas.
- **Foster Connections:** Help students weave information by connecting textual details with prior knowledge, themes, or related texts.
- **Promote Critical Questioning:** Encourage students to revisit initial ideas, test them, and refine their interpretations through evidence-based discussions.
- **Model Interpretive Thinking:** Use think-alouds to demonstrate how to probe text meanings and adjust interpretations.
- **Provide Scaffolded Curation Opportunities:** Allow students to develop and refine interpretations through projects like creating thematic presentations or writing analytical responses.

(Reynolds et al., 2020)

Before Reading

Organize students into pairs and discuss the concept of interpretation as a reading objective for a short literary piece, like a poem. Explain that interpretation involves making predictions and gathering evidence from the text to create their own understanding.

During Reading

Have student pairs read a short segment of the text, pausing often to interpret. Encourage them to notice patterns, make predictions, collect evidence from the text, and explore potential meanings through discussion.

After Reading

Lead a class discussion where students share their interpretations and reflect on how they determined which interpretations were supported by the text. Ask students to evaluate the effectiveness of the "Say Something Interpretive" strategy and consider how they might apply it when reading independently.

(Reynolds et al., 2020)

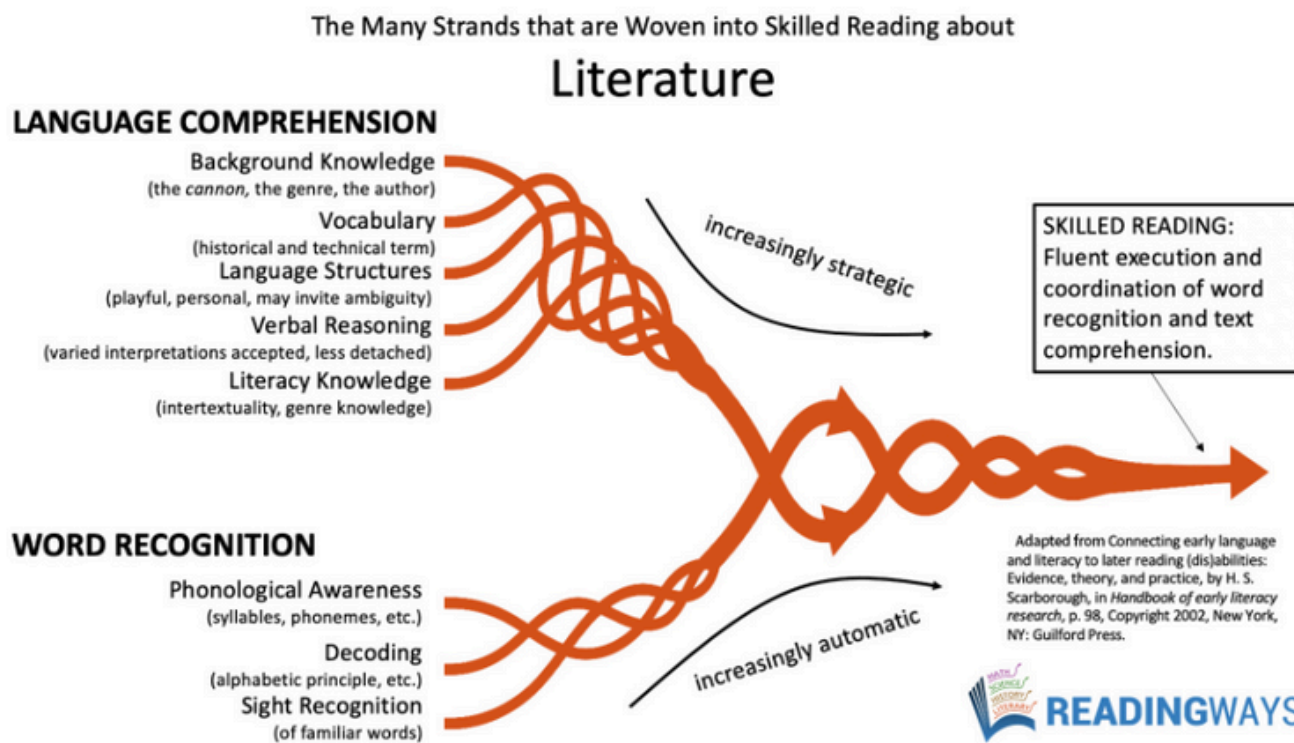


(Rainey & Moje, 2012; Reynolds & Rush, 2017)

Questions to Consider for ELA Instruction

- What is the genre or text type (text structure)?
- How is human agency involved?
- Is knowing about the author important for understanding the text?
- What is the author's purpose?
- What is the author's point of view?
- What are the important elements of the narrative?
 - Who? What? Where? When? Why?
- What is the theme? Where in the text is the theme made evident?
- What is the literal meaning and implied meaning of the text?

(CEEDAR Center, n.d.)



(Lawrence, 2024)

Scarborough's Reading Rope (Scarborough, 2001) is a metaphor for how students develop as skilled readers. The bottom portion of the rope model focuses on word recognition skills. Ideally, these skills are mastered in elementary school (by 3rd or 4th grade); however, often, students need additional interventions with this into middle and/or high school. Evidence-based interventions should be provided in layers 2 or 3 of MLSS by a trained interventionist. The visual above was adapted to show how the upper strands, which focus on language comprehension, apply to literature and secondary teachers of ELA.

Key Literacy Practices for Math

- **Reread:** Rereading helps mathematicians understand complex problems, and students should use it as a problem-solving strategy.
- **Learn Variable Names:** Knowing what variables represent improves equation comprehension.
- **Read Equations Correctly:** Equations follow specific reading rules that reinforce proper order of operations.
- **Learn Precise Definitions:** Mathematical terms have exact meanings, so students should memorize definitions and study examples.
- **Detect Errors:** Identifying errors in equations sharpens critical thinking and accuracy.
- **Filter Important Information:** Students must distinguish key math content from unnecessary details in textbooks and word problems.

(Shanahan, 2015)

Mathematical literacy emphasizes reasoning and communication, requiring students to construct arguments and critique others' reasoning with instruction focusing on reasoning processes (Hillman, 2013).

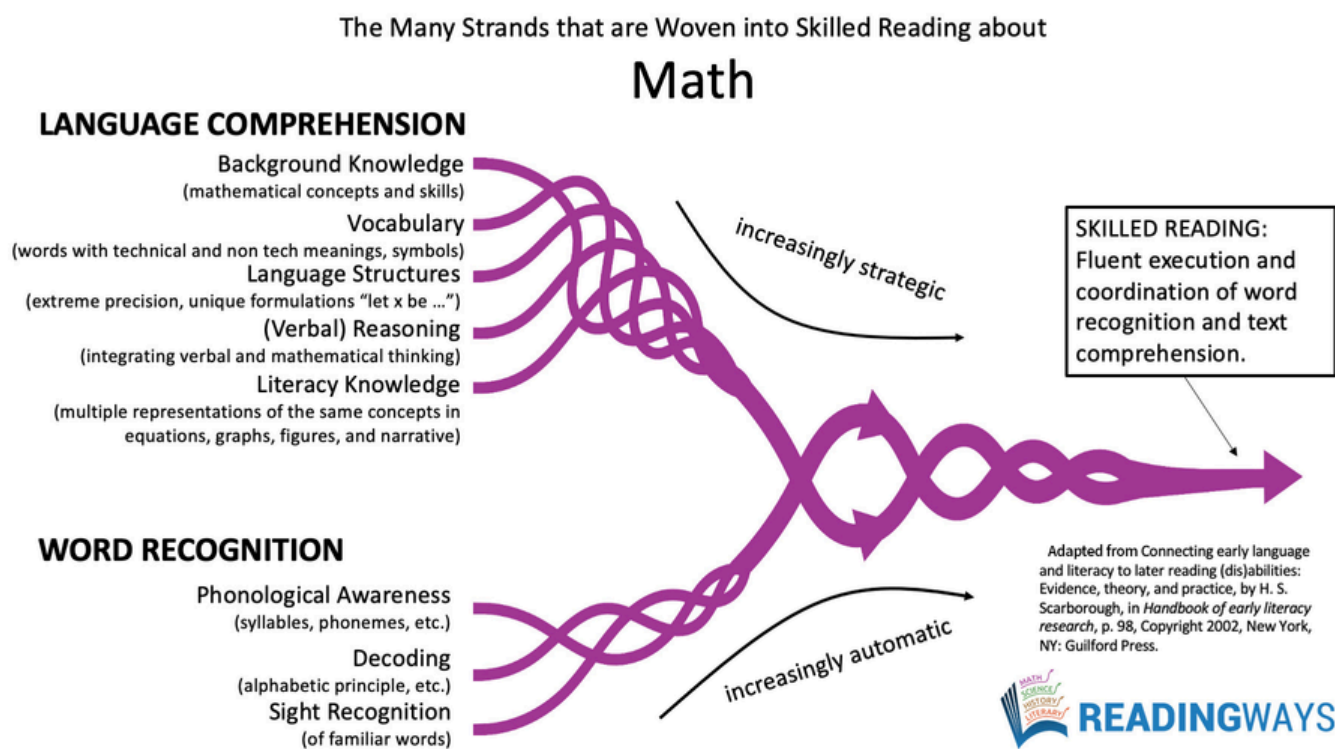
What is unique about math texts?

Math texts are dense and require students to interpret technical vocabulary, symbols, and visuals alongside natural language to construct meaning effectively. Unlike traditional reading, mathematical reading involves rereading, recognizing variable names, and understanding equations' directional flow to grasp the problem structure. Mathematical terms often have specific meanings that differ from everyday usage (e.g., "prime"), requiring precise definitions and structured vocabulary learning. Encouraging students to find and correct errors in mathematical reasoning helps them develop deeper conceptual understanding. Math texts can include extraneous or distracting information, so students should be guided to focus on essential problem-solving elements. Mathematical understanding requires translating between different representations, such as words, equations, graphs, and diagrams, to fully grasp concepts (Fang & Schleppegrell, 2008).

Questions to Consider for Math Instruction

- How is the information presented?
- Can I interpret the information?
- What is the specialized meaning of the vocabulary in mathematics?
- Can I explain what all the symbols mean, including the symbols from the Greek alphabet?
- What is the underlying logic of the theorem?
- What is the correct form of mathematical communication?
- How can I map mathematical representations against explanations in the text?
- Where are the errors?

(CEEDAR Center, n.d.)



(Lawrence, 2024)

Notation in mathematics and language structures is unique, requiring students to integrate literacy and numeric skills to comprehend equations, symbols, and technical explanations. Supporting students in reading like mathematicians involves guiding their attention to key information while balancing the cognitive demands of computation and language comprehension (Lawrence, 2024).

Key Literacy Practices for History

- **Source and Contextualize:** Historians analyze the author, context, and purpose of a text before reading to understand biases and influences.
- **Corroborate:** Trustworthy historical information is supported by multiple sources, so students should compare texts to evaluate reliability.
- **Analyze Relationships Among Events:** Historians determine cause-and-effect relationships by studying timelines and using tools like cause-effect diagrams.
- **Read Multiple Genres:** Studying history requires reading various sources, like political cartoons, photographs, and primary documents, for deeper insight.
- **Understand the Language of History:** Historical writing often uses complex sentences with cause-and-effect transitions, requiring explicit instruction in text analysis.

(Shanahan, 2015)

Historians classify, source, and interpret texts using historical theory, while students need scaffolding to develop similar strategies (Leinhardt & Young, 1996).

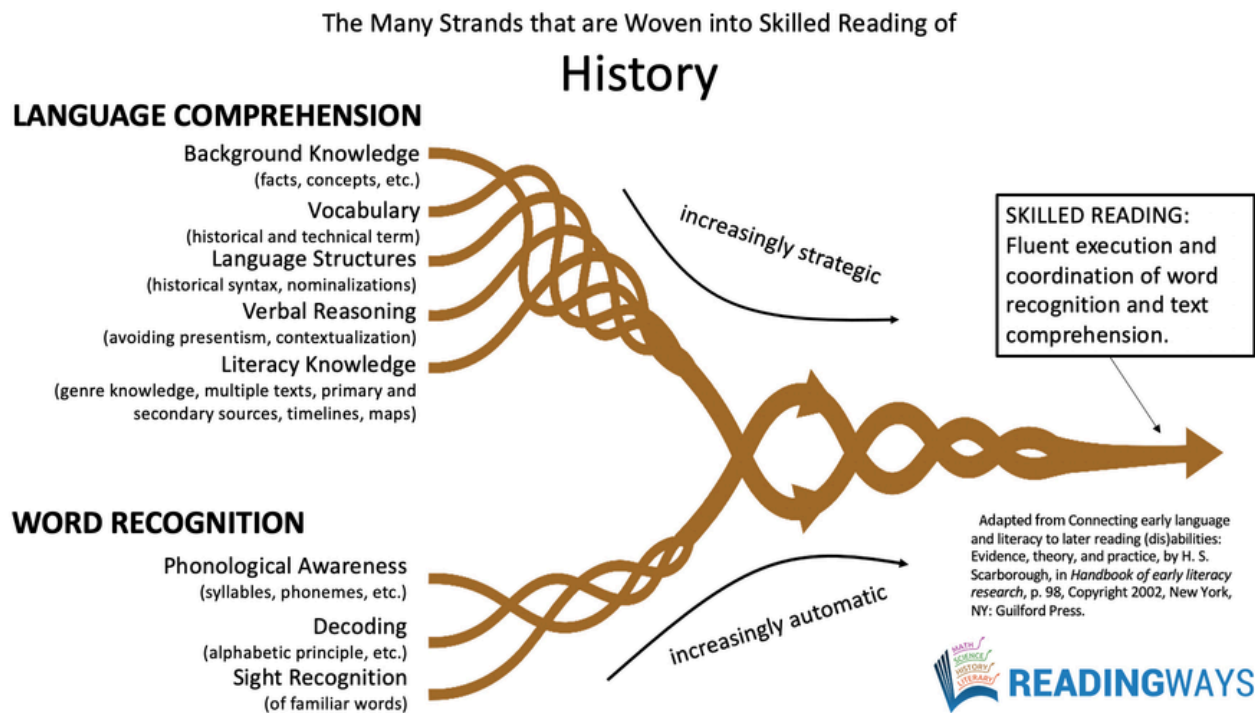
What is unique about history texts?

Historians evaluate an author's perspective, purpose, and historical context before analyzing a text. Students should be taught to critically examine sources using explicitly taught strategies. Historical claims gain credibility through multiple sources. Students should compare accounts with differing perspectives and use tools like comparison charts to assess reliability. Historians examine patterns and relationships between events to determine causation. Students can use graphic organizers, such as cause-effect charts, to analyze historical trends. Understanding history requires analyzing events through political, social, economic, and cultural lenses. Students can use frameworks like G-SPRITE to categorize and interpret historical developments. History requires reading primary sources, political cartoons, and photographs. Exposure to diverse text types strengthens students' ability to analyze historical narratives. Historians use specialized language to express causality and chronology. Students should practice writing both historical narratives and arguments based on corroborated evidence (Fang & Schleppegrell, 2008).

Questions to Consider for History Instruction

- Who wrote this? What is the author's bias?
- What did the author know? When did he/she know that information?
- When was this written?
- Who is the audience?
- What is the author's purpose?
- What was going on at this time?
- What were people thinking and doing?
- What did people believe?
- Who or what is this about?
- Do the documents agree? Do they tell the same or different stories?

(CEEDAR Center, n.d.)



(Lawrence, 2024)

Historians construct accounts of the past by analyzing multiple sources, valuing corroboration while presenting subjective evaluations in an objective tone (Wineburg, 1991; Schleppegrell, 2004; Galloway et al., 2013). To help students read like historians, educators must scaffold background knowledge and support the interpretation of complex primary sources with language differences (Lawrence, 2024).

Key Literacy Practices for Science

- **Transforming Information:** Scientists interpret concepts by shifting between prose, diagrams, and equations, and students can practice this to deepen understanding.
- **Writing for Audiences:** Scientists write differently for peers and general audiences, and students can develop these skills through varied writing assignments.
- **Learning Vocabulary:** Scientific terms often use Greek and Latin roots, and vocabulary notebooks help students track meanings, roots, and connections.
- **Note-Taking:** Structured note-taking templates guide students in organizing key scientific information like properties and processes.
- **Language of Science:** Students can analyze sentences to understand the precise, technical language used in scientific texts.

(Shanahan, 2015)

Science literacy involves understanding scientific processes and terminology, while disciplinary literacy emphasizes using reading, writing, and analytical thinking in scientific contexts (Norris & Phillips, 2003; Cervetti & Pearson, 2012).

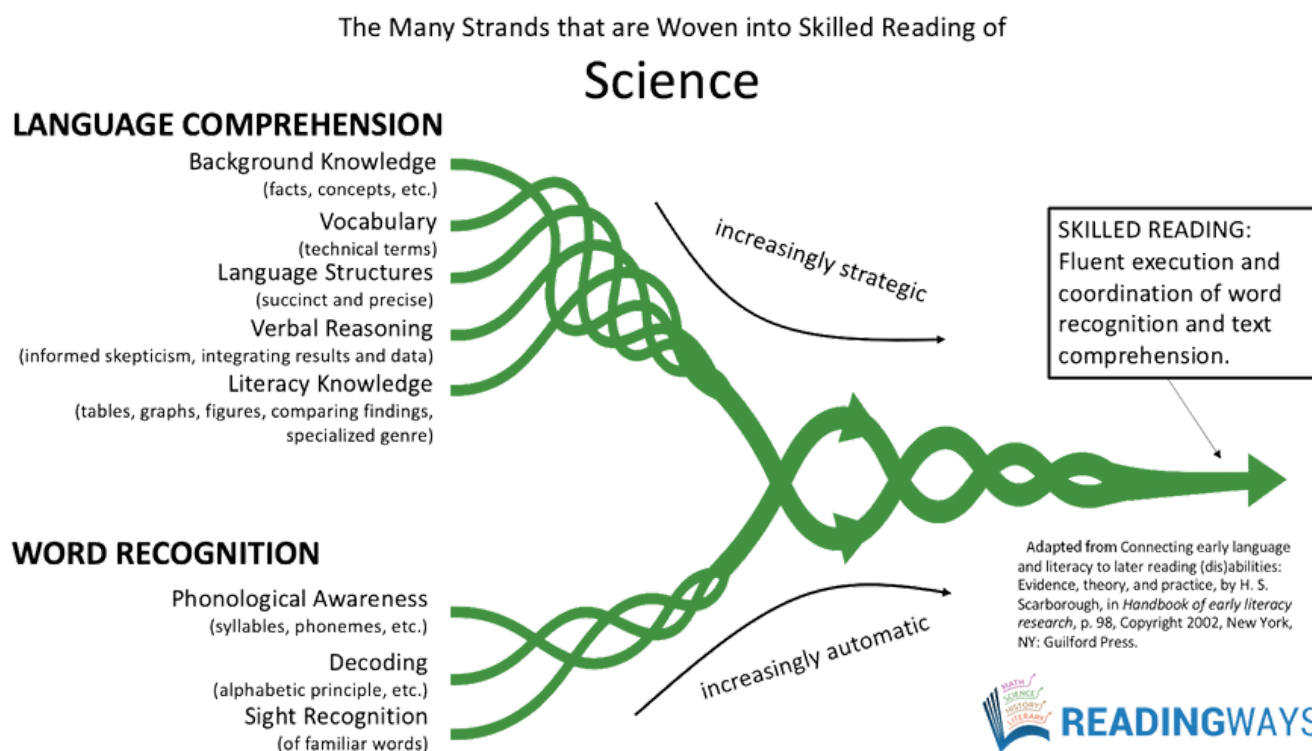
What is unique about science texts?

Secondary science texts are technical, dense, and abstract, requiring students to develop specialized literacy skills to engage with content effectively. Teachers need to explicitly teach how language constructs scientific knowledge and integrates technical terms and complex syntax unique to science texts. Students must be able to deconstruct dense scientific language and better understand concepts. To support students, teachers can model close reading of science texts, emphasizing how authors structure and present information. Teachers should also help students grasp the relationship between processes and the organization of content, improving comprehension and critical thinking. The analysis of scientific texts encourages students not just to comprehend but also to critique and question the information presented, enabling them to engage more deeply with scientific practices and reasoning (Fang & Schleppegrell, 2008).

Questions to Consider for Science Instruction

- What are the Latin & Greek roots of the vocabulary?
- What is the meaning of the prefixes & suffixes?
- What are the relationships among concepts?
- What is the scientific meaning of the vocabulary?
- How is nominalization used?
- What are the processes discussed?
- What are the facts I need to note?
- What is the interpretation of the graphs, charts, and formulas?
- What are the functions of the investigation?
- Have the conclusions been corroborated? How does this information transform our knowledge?
- What is the meaning of the scientific signs & symbols?

(CEEDAR Center, n.d.)



(Lawrence, 2024)

Science teachers should strategically integrate multiple sources of information, such as technical language, data visualizations, and written interpretations. Since scientific texts use precise language, hedging, and complex structures, teachers must explicitly teach students how to navigate and critically analyze these features to become skilled scientific readers (Lawrence, 2024).

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