

Knowledge Matters Research Compendium:

A Summary of Key Evidence for the Knowledge Matters Review Tool

Prequel: Early Childhood Essentials

- Four fundamental, research-based attributes of curricula that help create rich learning environments rooted in building knowledge, language, and literacy skills for young children include (but are not limited to):
- Routinely focusing content-rich read-alouds on science and social studies to expose young children, including children learning English, to the academic vocabulary, syntax, and content they need to thrive throughout their school years. Informational texts are crucial for emphasizing the development of content knowledge and vocabulary.
- Topically organizing read-alouds from multiple genres, bundled to build rich science and social studies knowledge. These texts are ordered deliberately such that vocabulary and concepts introduced in one are revisited and extended in another.

Neuman, S. B., & Kaefer, T. (2018). Developing low-income children’s vocabulary and content knowledge through a shared book reading program. *Contemporary Educational Psychology*, 53, 15–24. <https://doi.org/10.1016/j.cedpsych.2017.12.001>

Instructional Implications:

This study examined the effects of a science-focused shared-book reading intervention designed to develop low-income children’s oral language vocabulary and content knowledge. The yearlong intervention for PreK-1 classrooms used crosscutting concepts and vocabulary within categories to build knowledge networks. Children in the treatment group learned significantly more words and science concepts than those in the control group, and growth for English learners exceeded that of native English speakers. Authors conclude, “As early as Pre-K, children can profit from systematic and focused instruction that begins the process of building knowledge networks essential for further content learning and comprehension development.”

Neuman, S. B., Kaefer, T., & Pinkham, A. M. (2016). Improving low-income preschoolers’ word and world knowledge: The effects of content-rich instruction. *The Elementary School Journal*, 116(4).

Instructional Implications:

This study examined the efficacy of a content-focused shared-book reading approach in preschool classrooms that integrated life science and literacy instruction, with an emphasis on using informational texts. Significant results were reported for children’s growth in vocabulary and conceptual knowledge compared to their counterparts in “business-as-usual” classrooms. Results included children’s ability to apply their knowledge to an understanding of core themes related to the life sciences. Authors note, “...instructionally, this might imply that teachers need to place greater attention on the vocabulary and conceptual load of texts rather than on generic comprehension strategy instruction.”

Pinkham, A. M., Kaefer, T., & Neuman, S. B. (Eds.). (2012). *Knowledge development in early childhood: Sources of learning and classroom implications*. Guilford Press. <https://eric.ed.gov/?id=ED534267>

Instructional Implications:



- Teaching words, phrases, and concepts essential for understanding the read-alouds bit by bit through multiple exposures as children listen to, interact, and play with oral language. Academic vocabulary about specific topics and terms used across topics are taught in networks of associated words that overlap in meaning or are connected by key ideas.
- Engaging children in individual and small group knowledge-building activities that enhance their read-aloud experiences. This includes frequent opportunities for highly interactive, collaborative discussions focused on the content knowledge and related word meanings in the shared read-alouds to promote social learning and prompt students to draw on their knowledge, use complex language and expression, and explain their thinking.

This book synthesized research from leading early childhood scholars about how preschoolers and primary-grade students acquire knowledge through play and other instructional experiences, including interactions with parents, teachers, and classmates, and learning from storybooks and a range of media. Chapters on exemplary instructional strategies show teachers what they can do to build children's content knowledge while also promoting core literacy skills.

Gonzalez, J. E., Kim, H., Anderson, J., & Pollard-Durodola, S. (2024). The effects of a science and social studies content rich shared reading intervention on the vocabulary learning of preschool dual language learners. *Early Childhood Research Quarterly, 66*, 34–47. <https://doi.org/10.1016/j.ecresq.2023.08.011>

Instructional Implications:

This study examined the effects of a content-based shared-book reading intervention on vocabulary outcomes of dual-language preschool learners. Results revealed significantly positive effects on proximal measures of learners' expressive and receptive vocabulary.

Hadley, E. B., Dickinson, D. K., Hirsh-Pasek, K., & Golinkoff, R. M. (2018). Building semantic networks: The impact of a vocabulary intervention on preschoolers' depth of word knowledge. *Reading Research Quarterly, 54*, 41–61. <https://doi10.1002/rrq.225>

Instructional Implications:

This study examined the impact of a vocabulary intervention for preschool learners that used shared-book reading of informational texts and guided play methods to teach words in conceptually linked categories, such as taxonomic groups. Results suggest that cultivating deep vocabulary knowledge includes not only teaching single words but also introducing systems of conceptually related words to build semantic networks.

Pollard-Durodola, S. D., Gonzalez, J. E., Simmons, D. C., Davis, M. J., Simmons, L., & Nava-Walichowski, M. (2012). Using knowledge networks to develop preschoolers' content vocabulary. *The Reading Teacher, 65*(4), 265–274.

Instructional Implications:

This paper reports on how content-based shared-book reading practices can be used to accelerate preschool children's oral language skills when accompanied by explicit interactive discussions that assist children in making connections between content vocabulary and domain knowledge. Instructional practices also include integrating related informational and narrative texts to provide multiple exposures to words and concepts. Authors note, "...teachers in our study perceived that children increased their word and world knowledge when shared book-reading instruction integrated informational and narrative books, picture/concept cards, and thematic content."



1: Laser-like focus on what matters most for literacy

Curriculum is driven by the integration of five literacy accelerators that have a formidable research base. They include:

- Securing solid foundational reading skills early on (preferably by grade 3, to greatly enhance the likelihood that students are fluent readers at every grade level thereafter);
- Expanding students' vocabulary knowledge through a volume of reading, explicit instruction, and many opportunities to hear and use target words;
- Growing students' general knowledge of the world so they have a trove of knowledge to reference when they read, write, and present;
- Guiding students to marshal evidence and communicate it when speaking and writing about what the text they are reading is communicating; and
- Building solid reading habits and stamina through the regular, close reading of challenging, content-rich texts to develop a standard of coherence—an expectation and ability to have what is read make sense.

Foundational Reading Skills

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS.

Instructional Implications:

A meta-analysis of multiple studies concluded that guided oral reading and repeated reading procedures (such as those used in close reading) increase both fluency and comprehension.

Cunningham, A. E., & Stanovich, K. E. (1998). The impact of print exposure on word recognition. In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy.* Lawrence Erlbaum Associates.

Instructional Implications:

Orthographic processing ability accounts for word recognition skills independent of phonological processing.

Ehri, L. C. (2014). Orthographic mapping in acquiring sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading, 18(1), 5–21.*

Instructional Implications:

“Orthographic mapping (OM) involves the formation of letter-sound connections to bond the spellings, pronunciations, and meanings of specific words in memory. It explains how children learn to read words by sight, to spell words from memory, and to acquire vocabulary words from print.” OM is critical to students developing accuracy and automaticity in word recognition.

Paige, D. D. (2011). Engaging struggling readers through situational interest: A model proposing the relationships among extrinsic motivation, oral reading fluency, comprehension, and academic achievement. *Reading Psychology, 32(5), 395–425.*

Instructional Implications:

Fluency measures accounted for 50% of the variance in students' reading comprehension.

Growing General Knowledge (See Dimensions 1–6)

Dochy, F., Segers, M., & Buehl, M. M. (1999). The relation between assessment practices and outcomes of studies: The case of research on prior knowledge. *Review of Educational Research, 69(2), 145–186.*



Instructional Implications:

Over a quarter-century of research supports the importance of general knowledge to proficient reading comprehension. A review of 183 articles, books, papers, and research reports related to prior knowledge concluded that “it is difficult to overestimate the contribution of individuals’ prior knowledge to reading comprehension.”

Cervetti, G. N., & Wright, T. S. (2020). The role of knowledge in understanding and learning from text. In E. B. Moje, P. P. Afflerbach, P. Enciso, & N. K. Lesaux (Eds.), *Handbook of reading research* (Vol. 5, pp. 237–260). Routledge.

Instructional Implications:

After sifting through decades of studies, authors conclude, “Knowledge seems to have a greater impact on text comprehension than do general reading comprehension or decoding skills, and knowledge may help to compensate for lower levels of comprehension and decoding skill.”

Catts, H. W. (2021–2022). Rethinking how to promote reading comprehension. *American Educator*, 45(4), 27–33.
<https://www.aft.org/ae/winter2021-2022/catts>

Instructional Implications:

Reading comprehension is unlike other aspects of reading in that it is not a skill that can be reduced to a single score or improved by short-term instruction/intervention. Rather, it is a condition that is created by teaching fundamental reading skills in a content-rich integrated curriculum that provides background and language knowledge.

Willingham, D. T. (2017, November 25). How to get your mind to read. *The New York Times*. <https://www.nytimes.com/2017/11/25/opinion/sunday/how-to-get-your-mind-to-read.html>

Instructional Implications:

Background knowledge is vital for reading comprehension.

Vocabulary Development (See Dimension 3)

Marshal Evidence when Speaking and Writing (See Dimensions 5 & 6)

Close Reading of Complex Text (See Dimension 2)



<p>Curriculum is designed to seamlessly integrate practices from ELA standards in reading, writing, speaking, and listening, as well as facility with language. The standards themselves are not the goal of daily instruction; instead, the goal of instruction is to develop students' ability to understand texts they encounter and to express that understanding in multiple ways. Standards mastery is the end result of, not the organizing force for, reading instruction.</p>	<p>Liben, M., & Pimentel, S. (2018). <i>Placing text at the center of the standards-aligned ELA classroom.</i> Student Achievement Partners. https://achievethecore.org/page/3185/placing-text-at-the-center-of-the-standards-aligned-ela-classroom</p> <p><u>Instructional Implications:</u></p> <p>The ELA standards (reading, writing, speaking and listening, and language) need to be approached holistically, the text itself pointing to what distinct standards arise from its particular demands, placing the text at the center of the standards-aligned classroom.</p> <p>Hwang, H., Cabell, S. Q., & Joyner, R. E. (2022). <i>Effects of integrated literacy and content-area instruction on vocabulary and comprehension in the elementary Years: A meta-analysis.</i> <i>Scientific Studies of Reading</i>, 26(3), 223–249. https://doi.org/10.1080/10888438.2021.1954005</p> <p><u>Instructional Implications:</u></p> <p>Integrated literacy and content-area instruction can enhance vocabulary and comprehension in the elementary years, with the additional benefit of simultaneously cultivating science and social studies knowledge.</p>
<p>Curriculum includes the use of strategies in context and as needed: when students encounter challenging sections of text, encouraging students to engage in mental moves to support their comprehension.¹ As with standards, strategy instruction is not the goal of lessons but a means to build comprehension and knowledge.</p>	<p>Duke, N. K., Ward, A. E., & Pearson, P. D. (2021). <i>The science of reading comprehension instruction.</i> <i>The Reading Teacher</i>, 74(6), 663–672.</p> <p><u>Instructional Implications:</u></p> <p>Reading comprehension is not automatic even when fluency is strong. For example, teaching text structures and features and other strategies foster reading comprehension development.</p> <p>Willingham, D. T. (2023, December 1). <i>Beyond comprehension.</i> <i>ASCD</i>, 81(4). https://www.ascd.org/el/articles/beyond-comprehension</p> <p><u>Instructional Implications:</u></p> <p>A review of 12 meta-analyses showed that while teaching comprehension strategies did improve children's understanding of texts, "existing experimental evidence does not support giving young readers extensive reading strategy instruction; students can gain enough benefit from limited experience with the strategies."</p> <p>McKeown, M. G., Beck, I. L., & Blake, R. G. K. (2009). <i>Rethinking reading comprehension instruction: A comparison of instruction for strategies and content approaches.</i> <i>Reading Research Quarterly</i>, 44(3), 218–253.</p> <p><u>Instructional Implications:</u></p>

¹ Sense-making strategies attend to text structure, common organizational structures, comprehension monitoring, inferencing, and others.



	<p>Students receiving content-based instructional approaches outperformed students receiving strategies-based instruction on various comprehension measures. Content-based instruction focuses student attention on the content of the text through open, meaning-based questions about the text.</p>
<p>Text selection shows evidence of curation. Lessons: 1) are well-paced, 2) dive deeply into content and the core texts, spending at least two or three weeks on a topic, 3) can reasonably be completed within the school year, and 4) avoid bulk and bloat by ensuring there is a strong rationale for each component of the curriculum.</p>	<p>Cabell, S., Goldenberg, C., Griffin, A., Paige, D. D., & Fillmore, L. W. (2020) <i>Comparing reading research to program design: An examination of McGraw Hill Education’s Wonders, an elementary literacy curriculum</i>. Student Achievement Partners. https://achievethecore.org/page/3364/comparing-reading-research-to-program-design-an-examination-of-mcgraw-hill-education-s-wonders-an-elementary-literacy-curriculum</p> <p><u>Instructional Implications:</u></p> <p>When a curriculum is loaded with so many bells, whistles, and options—particularly when they are of varied quality and relevance—a teacher can easily wind up teaching the weak stuff and miss what’s strong and aligned.</p> <p>May, H., Strong, J. Z., & Walpole, S. (2023). The effects of Bookworms literacy curriculum on student achievement in grades 2–5. <i>Scientific Studies of Reading</i>. https://doi.org/10.1080/10888438.2023.2284811</p> <p><u>Instructional Implications:</u></p> <p>This study provides evidence that a comprehensive literacy curriculum emphasizing high-volume reading of grade-level texts, the use of evidence-based instructional practices, and repetitive instructional routines for reading and writing—as Bookworms exemplifies—produces a significant positive effect on student achievement for students with a range of initial reading achievement.</p>



2: Communal close reading of content-rich, challenging texts

Curriculum includes regular communal practice for all students with high-quality, complex texts that anchor each unit. These texts are at students' grade level, as defined by quantitative and qualitative analyses.² In K-2, interactive read-alouds that are two to three years above what children are able to read themselves are a staple. Read-alouds are interactive with specific instructional goals and continue to contribute to knowledge-building well into adolescence.

ACT. (2006). *Reading between the lines: What the ACT reveals about college readiness in reading.*

Instructional Implications:

The ability to comprehend complex text is the factor that differentiates college-ready readers.

Stenner, A. J., Sanford-Moore, E., & Williamson, G. L. (2012). *The Lexile® Framework for Reading quantifies the reading ability needed for "College & Career Readiness."* MetaMetrics.

Instructional Implications:

This study showed that college- and career-readiness texts had a median complexity of 1300L while the measured median complexity of 12th-grade texts was only 1130L. Putting students on a college- and career-ready trajectory requires closing the vast gap in text complexity, K-12.

Fillmore, L. W., & Fillmore, C. J. (2012). *What does text complexity mean for English learners and language minority students?* [Paper presentation]. Understanding Language Conference, Stanford, CA.

Instructional Implications:

When English learners are provided access to a range of authentic texts embodying various elements of complexity, they achieve at higher levels on both language development and standards-based assessments.

Adams, M. J. (2011). *Advancing our students' language and literacy: The challenge of complex texts.* *American Educator*, 34(4), 4–11, 53.

Instructional Implications:

There are challenges and many benefits to students understanding complex text. The piece discusses ways to meet those challenges so all students can be prepared for advanced reading and learning.

Fisher, D., & Frey, N. (2023). *Five peer tutoring strategies for the classroom.* *ASCD*, 81(2).

Instructional Implications:

Students' academic and social outcomes improve when they teach and learn from each other. Doing so transforms a classroom into a hub of peer-to-peer learning and can support all students reading more challenging texts.

² The curriculum rejects the leveled-reader approach that denies many students access to rigorous texts in favor of providing universal student access to rigorous texts. See <https://bit.ly/SAP-grade-level-chart>



	<p>Goldenberg, C. (1991). <i>Instructional conversations and their classroom applications</i>. Center for Research on Education, Diversity and Excellence. https://escholarship.org/uc/item/6q72k3k9</p> <p><u>Instructional Implications:</u></p> <p>Instructional conversations are discussion-based lessons that create opportunities for students' conceptual and linguistic development. They are intended to help students use knowledge and skills to understand, appreciate, and grapple with important and challenging ideas.</p> <p>Sticht, T. G., & James, J. H. (1984). Listening and reading. In P. D. Pearson (Ed.), <i>Handbook of reading research</i> (1st ed., pp. 293–317).</p> <p><u>Instructional Implications:</u></p> <p>Read-alouds are a powerful tool for teachers to foster literacy development. They expose students to vocabulary, syntax, and content that is more sophisticated than what they can read on their own. For most students, listening comprehension far outpaces reading comprehension and only catches up to listening comprehension in middle school.</p>
<p>Curriculum provides repeated encounters with each challenging, content-rich complex text to allow students to grapple with high-quality, text-specific questions and build their understanding.³ Discussions are a regular dimension of these sense-making encounters.</p>	<p>August, D., & Shanahan, T. (2008). <i>Developing reading and writing in second-language learners</i>. Routledge.</p> <p><u>Instructional Implications:</u></p> <p>In addition to a variety of other findings, multiday readings of complex texts—each with a different focus and purpose—are a more robust way to scaffold the reading experience for students and provide them with productive exposure to rich text.</p> <p>National Reading Panel. (2000). <i>Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction</i>. Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS.</p> <p><u>Instructional Implications:</u></p> <p>A meta-analysis of multiple studies concluded that guided oral reading and repeated reading procedures (such as those used in close reading) increase both fluency and comprehension.</p>
<p>Culminating assignments regularly reflect what is essential for students to learn from the text(s), including the information contained within them; offer practice using more</p>	<p>Intersegmental Committee of the Academic Senates (ICAS) of the California Community Colleges, the California State University, and the University of California. (2002). <i>Academic literacy: A statement of competencies expected of students entering California's public colleges and universities</i>.</p>

³ Lesson focus is expressly on students securing specific knowledge about the content and structure of the text, not on single skills or isolated standards (like “find the main idea” or “find the key details”) that employ texts and topics as their vehicles for discrete skills attainment.



sophisticated vocabulary and syntax; and address several grade-level (or above) standards.

Instructional Implications:

Capturing learning in writing is an effective way for students to solidify what they have learned. Presenting that collected evidence effectively, whether by summarizing its essence, responding to questions posed on an assignment, or developing a well-reasoned formal argument, cements understanding that too often remains nebulous unless written down.



3: Systematic development of high-value academic language to support building knowledge

Curriculum provides robust vocabulary and syntax routines both in context (through text-based questions and tasks) and out of context (through games, exercises, etc.). These routines are designed to strengthen verbal reasoning as well as knowledge of morphology.

Anderson, R. C., & Nagy, W. E. (1993). *The vocabulary conundrum* (Technical Report No. 570). Center for the Study of Reading.

Instructional Implications:

Proficient students learn two to three thousand words a year—too many to be learned just through direct instruction. Indirect instruction refers to learning the meaning of words from context while reading. The context is the other words in the texts students know and the topic or any references that students are familiar with.

Cervetti, G. N., Wright, T. S., & Hwang, H. (2016). Conceptual coherence, comprehension, and vocabulary acquisition: A knowledge effect? *Reading and Writing* 29(4), 761–779.

Instructional Implications:

Students reading a set of connected texts on one topic gained significantly more Tier Two vocabulary compared to reading the same number of texts on diverse topics.

Nagy, W., Anderson, R. C., Schommer, M., Scott, J. A., & Stallman, A. C. (1989). Morphological families in the internal lexicon. *Reading Research Quarterly*, 24(3), 262–282.

Instructional Implications:

In the middle grades and beyond, estimates are that "more than 60 percent of the new words that readers encounter have relatively transparent morphological structure—that is, they can be broken down into parts." Cultivating awareness and understanding of morphology supports the independent acquisition of new words.

Nation, K., & Snowling, M. J. (2000). Factors influencing syntactic awareness skills in normal readers and poor comprehenders. *Applied Psycholinguistics*, 21(2), 229–241. <https://doi.org/10.1017/S0142716400002046>

Instructional Implications:

This study found that children with comprehension impairments have weak syntactic awareness skills, adding to the "body of evidence showing that poor comprehenders' difficulties extend beyond problems with reading comprehension to more general weaknesses with language processing."



<p>Words chosen for extended study in context are generally 1) essential to understanding, 2) more abstract, 3) part of a semantic word family (words related by meaning or concept), and 4) likely to appear in other complex texts students will read.</p>	<p>Hiebert, E. H., & Kamil, M. (Eds.). (2005). <i>Teaching and learning vocabulary: Bringing scientific research to practice</i>. Routledge, Taylor, and Francis Group.</p> <p><u>Instructional Implications:</u></p> <p>This study recommends three general criteria for determining which words to choose for intensive teaching: 1) words needed to comprehend the text fully, 2) words likely to appear in future texts from any discipline, and 3) words that are part of a word family or semantic network.</p>
<p>Curriculum revisits newly learned words and phrases in multiple contexts, including encouraging students to use them in their discussions and speaking and writing activities.</p>	<p>Neuman, S. B., Samudra, P., & Wong, K. M. (2021). <i>Two may be better than one: Promoting incidental word learning through multiple media</i>. <i>Journal of Applied Developmental Psychology</i>, 73, 10152.</p> <p><u>Instructional Implications:</u></p> <p>Students don't learn a word or concept with just one exposure. In addition to providing a brief explanation of keywords as they are encountered in a text, students need to revisit and use the words after reading.</p> <p>Beck, I. L., McKeown, M. G., & Kucan, L. (2008). <i>Creating robust vocabulary: Frequently asked questions and extended examples</i>. Guilford.</p> <p><u>Instructional Implications:</u></p> <p>Students need plentiful opportunities to use and respond to the words they learn through playful informal talk, discussion, and responding to what is read. This book provides numerous research-based methods for teachers to use.</p>



4: A volume of reading organized around conceptually coherent text sets to build knowledge

Curriculum is intentionally designed to give students grounding in a diverse range of topics in history, social studies, science, the arts, and literature by providing enough time (at least two to three weeks) to explore topics to allow for knowledge and vocabulary growth.⁴

Hwang, H., Lupo, S. M., Cabell, S. Q., & Wang, S. (2021). What research says about leveraging the literacy block for learning. *Reading In Virginia, XLII (2020-2021)*, 35–48.

Instructional Implications:

There are four high-impact knowledge-building practices that effectively infuse science and social studies content into ELA instruction: 1) planning units around content concepts, 2) using conceptually coherent text sets, 3) designing hands-on activities in connection with reading, writing, and discussion, and 4) teaching vocabulary using relations among words.

Kim, J. S., Gilbert, J. B., Relyea, J. E., Rich, P., Scherer, E., Burkhauser, M. A., & Tvedt, J. N. (2023). *Time to transfer: Long-term effects of a sustained and spiraled content literacy intervention in the elementary grades* (EdWorkingPaper No. 23-769). Annenberg Institute at Brown University. <https://doi.org/10.26300/t3c6-xh48>

Instructional Implications:

Sustained and spiraled content literacy intervention that emphasizes building domain and topic knowledge schemas and vocabulary for elementary-grade students improves students' long-term academic achievement outcomes.

Gray, A. M., Sirinides, P. M., Fink, R. E., & Bowden, A. B. (2022). Integrating literacy and science instruction in kindergarten: Results from the efficacy study of Zoology One. *Journal of Research on Educational Effectiveness*, 15(1), 1–21. <https://www.tandfonline.com/doi/full/10.1080/19345747.2021.1938313>

Instructional Implications:

Students whose teachers implemented this treatment with fidelity performed statistically significantly better in writing and decoding. Teachers also reported positive effects from the integrated curriculum on student engagement, learning, and behavior.

Cabell, S. Q., & Hwang, H. J. (2020). Building content knowledge to boost comprehension in the primary grades. *Reading Research Quarterly*, 55(1), 99–107.

Instructional Implications:

⁴ Units or modules are largely focused on topics rather than broadly drawn themes.



	<p>Based on theoretical arguments and empirical studies, knowledge building in English language arts instruction (i.e., content-rich instruction) can support language and content knowledge, leading to better linguistic and reading comprehension.</p>
<p>Curriculum provides a series of conceptually coherent text sets (or relies on full-length books) organized around topics of study available at various complexity levels, with less complex texts supporting access to more complex texts to build knowledge. These texts offer a range of different knowledge-building resources with a substantial number of nonfiction texts represented.</p>	<p>Lupo, S. M., Strong, J. Z., Lewis, W., Walpole, S., & McKenna, M. C. (2018). Building background knowledge through reading: Rethinking text sets. <i>Journal of Adolescent & Adult Literacy</i>, 61(4), 433–444.</p> <p><u>Instructional Implications:</u></p> <p>Success with the first text in a set facilitates students’ comprehension of subsequent texts. Using text sets changed teacher mindsets about students, especially those who tested below grade level. They were able to access grade-level content. It also increased the time students spent reading in the classroom and increased student motivation. Importantly, high school students were the subject of their study.</p> <p>Cervetti, G. N., Wright, T .S., & Hwang, H. (2016). Conceptual coherence, comprehension, and vocabulary acquisition: A knowledge effect? <i>Reading and Writing</i>, 29(4), 761–779.</p> <p><u>Instructional Implications:</u></p> <p>The single most robust method for rapidly growing students' vocabulary is to read conceptually related texts that cohere together to create a picture of a topic.</p> <p>August, D., Fenner, D. S., & Snyder, S. (2014). <i>Scaffolding instruction for English language learners: A resource guide for English Language Arts</i>. American Institutes for Research.</p> <p><u>Instructional Implications:</u></p> <p>If the text contains cultural, historical, or thematic information English learners are unlikely to have acquired, they can read short supplementary texts to help them acquire such knowledge. This extensive overview provides a number of research-based English learner scaffolds for teachers to use.</p> <p>Cunningham, A. E., & Stanovich, K. E. (1998). What reading does for the mind. <i>American Educator</i>, 22, 8–17. https://www.aft.org/sites/default/files/cunningham.pdf</p> <p><u>Instructional Implications:</u></p> <p>Exposure to print (reading volume) has long-term cumulative effects beyond its immediate task of gaining meaning from a particular passage. The subsequent cognitive consequences of differences in the accumulated volume of reading among individuals are profound.</p>



Curriculum expects students to regularly engage in a volume of reading of materials of their choice related to the topics being studied. The curriculum includes teacher and student scaffolds and structures, including lightweight student accountability (e.g., book talks, journals) to foster productive use of the reading time.

International Literacy Association. (2019) *Creating passionate readers through independent reading* [Literacy leadership brief].

Instructional Implications:

There are strong associations between independent reading and reading achievement when done right. Independent reading cannot substitute for teaching decoding, but it can improve reading comprehension. Here's what's been shown to work:

- “Boost student interest in and engagement with books through book tastings, new book displays, classroom blog posts, or Flipgrid or other video discussion platforms, where teachers can make connections between books and make recommendations to similar titles.
- Foster self-selected reading by providing books that reflect topics of interest and stories that are representative of all students in your classroom.
- Encourage and allow time for student discussion on favorite books through face-to-face conversations or through online chat platforms or apps.”

Toboada Barber, A., & Klauda, S. L. (2020). How reading motivation and engagement enable reading achievement: Policy implications. *Policy Insights from the Behavioral and Brain Sciences*, 7(1), 27–34.

Instructional Implications:

Reading motivation and engagement are malleable and shaped by children's environments at school and at home. Affording students choice and opportunities to follow their interests or “choose books that relate to their mores, countries, and communities” bolsters students' intrinsic motivation to read.



5: Regular discussions grounded in texts and topics to build knowledge

The curriculum provides guidance on engaging learners in productive and sustained academic discussions through thought-provoking questions that develop both a literal and deep understanding of the texts and content being studied, including cultivating students' abstract reasoning and analytical thinking. When students answer questions, they are consistently required to provide evidence for their responses.

Beck, I. L. & McKeown, M. G. (2006). *Improving comprehension with Questioning the Author: A fresh and expanded view of a powerful approach.* Scholastic.

Instructional Implications:

Providing effective questioning engages students and gives all students access to content and textual knowledge.

Beck, I. L., McKeown, M. G., & Sandora, C. A. (2021). *Robust comprehension instruction with Questioning the Author: 15 years smarter.* Guilford Press.

Instructional Implications:

A revised version of the earlier work based on a number of studies conducted by the authors and feedback from teachers around the country shows that active processing and questioning engage students in the reading process.

Chi, M. T. H., De Leeuw, N., Chiu, M., & LaVancher, C. (1994). Eliciting self-explanations improves understanding. *Cognitive Science, 18(3), 439–477.*

Instructional Implications:

Getting students to explain their thinking about what they've read to themselves and/or others boosts comprehension.

Murphy, K. P., Soter, A. O., Wilkinson, I. A. G., & Hennessee, M. N. (2009). Examining the effects of classroom discussion on students' comprehension of text: A meta-analysis. *Journal of Educational Psychology, 101(3), 740–764.*

Instructional Implications:

Decades of research findings identified several high-quality discussion approaches with positive impacts on student learning. Effective approaches typically involve students and teachers questioning the meaning of a text and mining evidence from that text to support their interpretation.

Goldenberg, C. (1991). *Instructional conversations and their classroom applications.* Center for Research on Education, Diversity and Excellence. <https://escholarship.org/uc/item/6q72k3k9>

Instructional Implications:

Instructional conversations are discussion-based lessons that create opportunities for students' conceptual and linguistic development. They are intended to help students use knowledge and skills to understand, appreciate, and grapple with important and challenging ideas.



<p>Collaboration is part and parcel of the curriculum, which establishes a relevance for the learning and seeks to build a community that processes, understands, and interprets content together.</p>	<p>Applebee, A., Langer, J., Nystrand, M., & Gamoran, A. (2003). Discussion-based approaches to developing understanding: Classroom instruction and student performance in middle and high school English. <i>American Education Research Journal</i>, 40(3), 685–730.</p> <p><u>Instructional Implications:</u></p> <p>Students whose classroom literacy experiences emphasize discussion-based approaches internalize the knowledge and skills necessary to independently engage in challenging literacy tasks.</p>
<p>Peer-to-peer discussions are threaded throughout instruction to make classrooms vibrant centers of intellectual exchange and co-learning.</p>	<p>Fisher, D., & Frey, N. (2023). <i>Five peer tutoring strategies for the classroom</i>. ASCD, 81(2).</p> <p><u>Instructional Implications:</u></p> <p>When students teach and learn from each other, their academic and social outcomes improve. They transform a classroom into a hub of peer-to-peer learning.</p>



6: A volume of writing to build knowledge

Curriculum includes frequent writing opportunities that are evidence-based and anchored in the content students are studying to extend and solidify their learning. Writing also includes regular use of short, focused research projects with teacher support appropriate to the grade level, again anchored in the assigned content.

Reither, J. A. (2000). Writing and knowing: Toward redefining the writing process. In E.P. J. Corbett, N. Myers, & G. Tate (Eds.), *The writing teacher's sourcebook* (pp. 286–293). Oxford University Press.

Instructional Implications:

Using evidence is not merely at the core of each academic discipline but is the glue that inseparably connects the foundational academic activities of writing, reading, and inquiry. "All three are learned not by doing any one alone, but by doing them all at the same time..." or, in other words, "ground[ing] writing in reading and inquiry."

Graham, S., & Hebert, M. (2010). *Writing to read: Evidence for how writing can improve reading*. Carnegie Corporation Time to Act Report. Alliance for Excellent Education.

Instructional Implications:

While citing evidence makes student writing richer and more engaging (and proves what they are claiming), there are numerous other benefits. Asking students to write about what they read simultaneously improves their expressive skills, comprehension, and ability to learn deeply from text(s).

Intersegmental Committee of the Academic Senates (ICAS) of the California Community Colleges, the California State University, and the University of California. (2002). *Academic literacy: A statement of competencies expected of students entering California's public colleges and universities*.

Instructional Implications:

The cognitive benefits of writing with text evidence are not just deep but also broad. Reading to comprehend with the goal of setting that understanding down in writing grows the domain knowledge of students and aids in their comprehension of future texts.

Wallace, R., Pearman, C., Hail, C., & Hurst, B. (2007). Writing for comprehension. *Reading Horizons: A Journal of Literacy and Language Arts*, 48(1).

Instructional Implications:

Considering a topic under study and then writing about it requires deeper processing than reading alone provides.

Curriculum includes writing assignments that vary in purpose, audience, genre, length, and duration. Composition instruction

Graham, S., Bruch, J., Fitzgerald, J., Friedrich, L., Furgeson, J., Greene, K., Kim, J., Lyskawa, J., Olson, C. B., & Wulsin, C. S. (2016). *Teaching secondary students to write effectively* (NCEE 2017-4002). National Center for Education Evaluation and Regional Assistance



<p>is generally directly or indirectly linked to the curriculum content.</p>	<p>(NCEE), Institute of Education Sciences, U.S. Department of Education. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/508_WWCPG_SecondaryWriting_122719.pdf</p> <p><u>Instructional Implications:</u></p> <p>Improving students’ writing skills helps them succeed across academic and vocational disciplines. Writing for different purposes, audiences, and with different goals is a vital component of students’ literacy achievement, and writing is a critical communication tool for students to convey a range of thoughts and opinions, describe ideas and events, and analyze information.</p> <p>Graham, S., Kihara, S. A., & MacKay, M. (2020). The effects of writing on learning in science, social studies, and mathematics: A meta-analysis. <i>Review of Educational Research</i>, 90(2), 179–226. https://doi.org/10.3102/0034654320914744</p> <p><u>Instructional Implications:</u></p> <p>Writing about content reliably enhanced learning (effect size = 0.30) across subjects and across grade levels.</p> <p>Graham, S., & Hebert, M. (2010). <i>Writing to read: Evidence for how writing can improve reading</i>. Carnegie Corporation Time to Act Report. Alliance for Excellent Education.</p> <p><u>Instructional Implications:</u></p> <p>Teaching students explicitly how to write about the texts they read (not just assigning writing) matters: writing instruction paves the way for improved reading fluency, comprehension, and learning.</p>
<p>Curriculum includes explicit instruction in the fundamentals of writing, including sentence construction and the planning, drafting, and writing of paragraphs and essays, as well as grammar and usage instruction in the context of students’ writing. This includes explicit instruction on how to convey knowledge through specific text genres and features.</p>	<p>Hochman, J. C., & Wexler, N. (2019). The connections between writing, knowledge acquisition, and reading comprehension. <i>Perspectives on Language and Literacy</i>, 45(4), 25–29. https://dyslexialibrary.org/wp-content/uploads/file-manager/public/1/Judith%20C.%20Hochman%20and%20Natalie%20Wexler.pdf</p> <p><u>Instructional Implications:</u></p> <p>Writing is best taught explicitly beginning at the sentence level, teaching linear outlines, and embedding writing in curriculum content.</p> <p>Graham, S., & Perin, D. (2007). <i>Writing next: Effective strategies to improve writing of adolescents in middle and high schools</i>. A report to Carnegie Corporation of New York. Alliance for Excellent Education. https://www.carnegie.org/publications/writing-next-effective-strategies-to-improve-writing-of-adolescents-in-middle-and-high-schools/</p> <p><u>Instructional Implications:</u></p> <p>Instructional methods such as sentence-combining and practical application of grammar in the context of students’ own writing are more effective than traditional instruction in syntax and parts of speech.</p>



Saddler, B., & Graham, S. (2005). The effects of peer-assisted sentence-combining instruction on the writing performance of more and less skilled young writers. *Journal of Educational Psychology, 97*(1), 43–54. <https://doi.org/10.1037/0022-0663.97.1.43>

Instructional Implications:

Sentence-combining instruction was significantly more effective for low-achieving writers than traditional grammar instruction.

Weaver, C. (1996). Teaching grammar in the context of writing. *The English Journal, 85*(7), 15–24.

Instructional Implications:

Grammar instruction must be contextualized and meaningful within students' reading and writing.

Myhill, D., Jones, S. M., Lines, H., & Watson, A. (2012). Re-thinking grammar: The impact of embedded grammar teaching on students' metalinguistic understanding. *Research Papers in Education, 27*(2), 139–166.

Instructional Implications:

Embedding grammar instruction into the writing process promotes students' understanding of their grammatical choices and their effect on a text's rhetorical purpose.



7: Targeted supports to ensure all students have access to challenging, grade-level content

<p>Curriculum provides the means to ensure all students work with and can meet grade-level standards. The curriculum provides both the systematic guidance and resources required for building in time and support for students reading below grade level, and/or students learning English, so that they can access the text and learn alongside peers.</p>	<p>National Academies of Sciences, Engineering, and Medicine. (2017). <i>Promoting the educational success of children and youth learning English: Promising futures</i>. The National Academies Press. https://doi.org/10.17226/24677</p> <p><u>Instructional Implications:</u></p> <p>English learners bring considerable resources, including knowledge of home language(s) and culture(s), that should be leveraged for English acquisition, learning more broadly, and graduating fully functional bilingual students. Several critical literacy supports have proved effective in providing English learners with productive opportunities to access grade-level content across the curriculum and develop academic English as part of subject-matter learning.</p> <p>Paunesku, D. (2019, July 9). <i>The deficit lens of the “achievement gap” needs to be flipped. Here’s how</i>. Education Week. https://www.edweek.org/leadership/opinion-the-deficit-lens-of-the-achievement-gap-needs-to-be-flipped-heres-how/2019/07</p> <p><u>Instructional Implications:</u></p> <p>If students aren’t learning at grade level, the approach to teaching them needs to change. To thrive, students need a sense of belonging and safety—a rapport and bond with their teacher(s) and peers. They need teachers who believe they can learn at high levels and literacy work that honors their cultures and communities while opening the door to the wide world. Equity can’t work as an afterthought or superficial gesture. It must be baked into instruction.</p>
<p>Curriculum includes strong representation of authors and illustrators of color in the texts children read, abundant opportunities to read how people from a range of historically underrepresented social groups have contributed to knowledge, and guidance on how to implement the curriculum in a manner that promotes equity and elevates student assets.</p>	<p>Bishop, R. S. (1990). <i>Mirrors, windows, and sliding glass doors. Perspectives: Choosing and Using Books for the Classroom, 6(3)</i>.</p> <p><u>Instructional Implications:</u></p> <p>Children need to see themselves reflected in the books they read lest they feel devalued. All children from all the cultures that make up American society need their mirrors. Children also need books that will help them understand the multicultural nature of the world in which they live and their connections to all other humans.</p> <p>Bell, Y. R., & Clark, T. R. (1998). <i>Culturally relevant reading material as related to comprehension and recall in African American children. Journal of Black Psychology, 24(4), 455–475</i>.</p> <p><u>Instructional Implications:</u></p>



	<p>Results showed that for Black students, stories depicting Black characters and themes consistent with their sociocultural experiences facilitated more efficient recall and comprehension than stories depicting White characters.</p> <p>Taboada Barber, A., & Klauda, S. L. (2020). How reading motivation and engagement enable reading achievement: Policy implications. <i>Policy Insights from the Behavioral and Brain Sciences</i>, 7(1), 27–34.</p> <p><u>Instructional Implications:</u></p> <p>Making meaning from text depends on students exercising complex cognitive skills. Therefore, paying attention to motivating and engaging students in what they are reading plays an important role in improving their reading skills and achievement. Educators need to devote time to figuring out how to incorporate the principles of reading motivation for particular students in particular classrooms, including drawing on specific practices aimed at motivating and engaging students of diverse language and ethnic backgrounds.</p>
<p>Curriculum provides a range of supports designed to address results from informal and more formal assessments (gathered from observations, assignments, and test questions), and promotes timely and concrete feedback to students.</p>	<p>Cole, R. W. (Ed.). (2008). <i>Educating everybody’s children: Diverse teaching strategies for diverse learners (2nd. ed.)</i>. ASCD.</p> <p><u>Instructional Implications:</u></p> <p>Care must be taken not to deem a certain segment of students deficient based on quantitative metrics—often a single test score. “The power of tests to translate difference into disadvantage” is borne most sharply by the students themselves. Such scores can condemn them to months of low-level, dead-end work with little regard to whether the test could even diagnose such a thing.</p> <p>TNTP. (2018). <i>The opportunity myth: What students can show us about how we are letting them down—and how to fix it</i>. https://tntp.org/assets/documents/TNTP_The-Opportunity-Myth_Web.pdf</p> <p>“Every student should have access to grade-appropriate assignments, strong instruction, deep engagement, and teachers with high expectations, every day, in every class, regardless of their race, ethnicity, or any other part of their identity.” Access to grade-appropriate assignments is an urgent priority for all students—especially those who are behind grade level. Access to instruction that asks them to think and engage deeply with challenging material is vital.</p>



8: Ease of enacting curriculum

<p>Curriculum is purposeful in its design, including many regular, predictable instructional routines that teachers and students can rely on from the moment the new program is enacted.</p>	<p>Colvin, G., & Lazar, M. (1995). Establishing classroom routines. In A. Deffenbaugh, G. Sugai, & G. Tindal (Eds.), <i>The Oregon Conference Monograph</i> (vol. 7, pp. 209–212). University of Oregon.</p> <p><u>Instructional Implications:</u></p> <p>Routines help to simplify a classroom environment and inform students precisely what to expect and what is expected of them; they also allow teachers to devote more time to instruction.</p> <p>May, H., Strong, J. Z., & Walpole, S. (2023). The effects of Bookworms literacy curriculum on student achievement in grades 2-5. <i>Scientific Studies of Reading</i>. https://doi.org/10.1080/10888438.2023.2284811</p> <p><u>Instructional Implications:</u></p> <p>This study provides evidence that a comprehensive literacy curriculum emphasizing high-volume reading of grade-level texts, the use of evidence-based instructional practices, and repetitive instructional routines for reading and writing—as Bookworms exemplifies—produces a significant positive effect on student achievement for students with a range of initial reading achievement. Especially important, the authors note, “Students who began third grade with relatively weaker achievement experienced more growth than those with average achievement.”</p>
<p>Curriculum is designed not only to advance student learning but also to help educators understand the “why” of included approaches and components. It incorporates educative dimensions (explanations designed explicitly to support teachers in effective implementation). Examples of such dimensions might include:</p> <ul style="list-style-type: none"> ● Explanations of how program elements facilitate student learning; ● Sample student responses; ● Tips for effective feedback; 	<p>Davis, E. A., & Krajcik, J. S. (2005). Designing educative curriculum materials to promote teacher learning. <i>Educational Researcher</i>, 34(3), 3–14.</p> <p><u>Instructional Implications:</u></p> <p>Educative design principles can impact student learning and change teacher practice with educative resources. Authors note that while illustrations and examples are taken from science curricula and materials, “The principles and processes applied generalize to the design of educative features across subject-matter areas.”</p>



<ul style="list-style-type: none"> • Models of exemplary practice; and • Discussions of why suggested pedagogical moves are useful. 	
<p>Teacher-facing materials are explicit and concrete about what program elements are essential for the core instruction and which are “nice to have” additional dimensions. This clarity extends to communicating high-level program dimensions for caregivers and community stakeholders.</p>	<p>Cabell, S., Goldenberg, C., Griffin, A., Paige, D. D., & Fillmore, L. W. (2020) <i>Comparing reading research to program design: An examination of McGraw Hill Education’s Wonders, an elementary literacy curriculum</i>. Student Achievement Partners. https://achievethecore.org/page/3364/comparing-reading-research-to-program-design-an-examination-of-mcgraw-hill-education-s-wonders-an-elementary-literacy-curriculum</p> <p><u>Instructional Implications</u></p> <p>When a curriculum is loaded with so many bells, whistles, and options—particularly when they are of varied quality and relevance—a teacher can easily wind up teaching the weak stuff and miss what’s strong and aligned.</p>
<p>Curriculum encourages professional learning that deals concretely with how the materials can be effectively implemented and supports ongoing and systematic work in teacher study groups and professional learning communities. (This is in contrast with one- or two-day “unpack the boxes and organize the materials” training sessions.) Professional learning should offer aligned sessions for teachers, coaches, and administrators.</p>	<p>Gulamhussein, A. (2013). <i>Teaching the teachers: Effective professional development in an era of high stakes accountability</i>. The Center for Public Education and the National School Boards Association.</p> <p><u>Instructional Implications:</u></p> <p>Aggregated data from dozens of studies uncovered the principles of effective professional development. Namely, professional learning should be ongoing, proceed over time for a significant duration, and with discipline-specific coaching focused on addressing classroom practice. They also found that the one-off sessions offered to most teachers don’t support them in implementation.</p>

