# EL Education

Addressing the Science of Reading

Background

More than 35 years of peer-reviewed research from the fields of educational psychology, cognitive science, and neuroscience contribute to our understanding of the science of reading. Scientific evidence shows that students need strong language-comprehension skills (content knowledge, background knowledge, verbal reasoning, language structure, and theory of mind), word-recognition skills (phonological awareness, phonics knowledge, decoding skills, and sight word recognition), and bridging skills (print-concept knowledge, reading fluency, vocabulary knowledge, morphological awareness, and self-regulation skills) to read successfully (Cantor et al., 2018; Catts et al., 2005; Cutting et al., 2015; Duke & Cartwright, 2021; Gough & Tunmer, 1986; Hoover & Tunmer, 2018; National Institute of Child Health and Human Development [NICHD], 2000; Rayner et al., 2001; Rose, 2006; Scarborough, 2001). Poor skill development in any of these areas creates a breakdown in reading abilities.

Figure 1: *The Science of Reading*
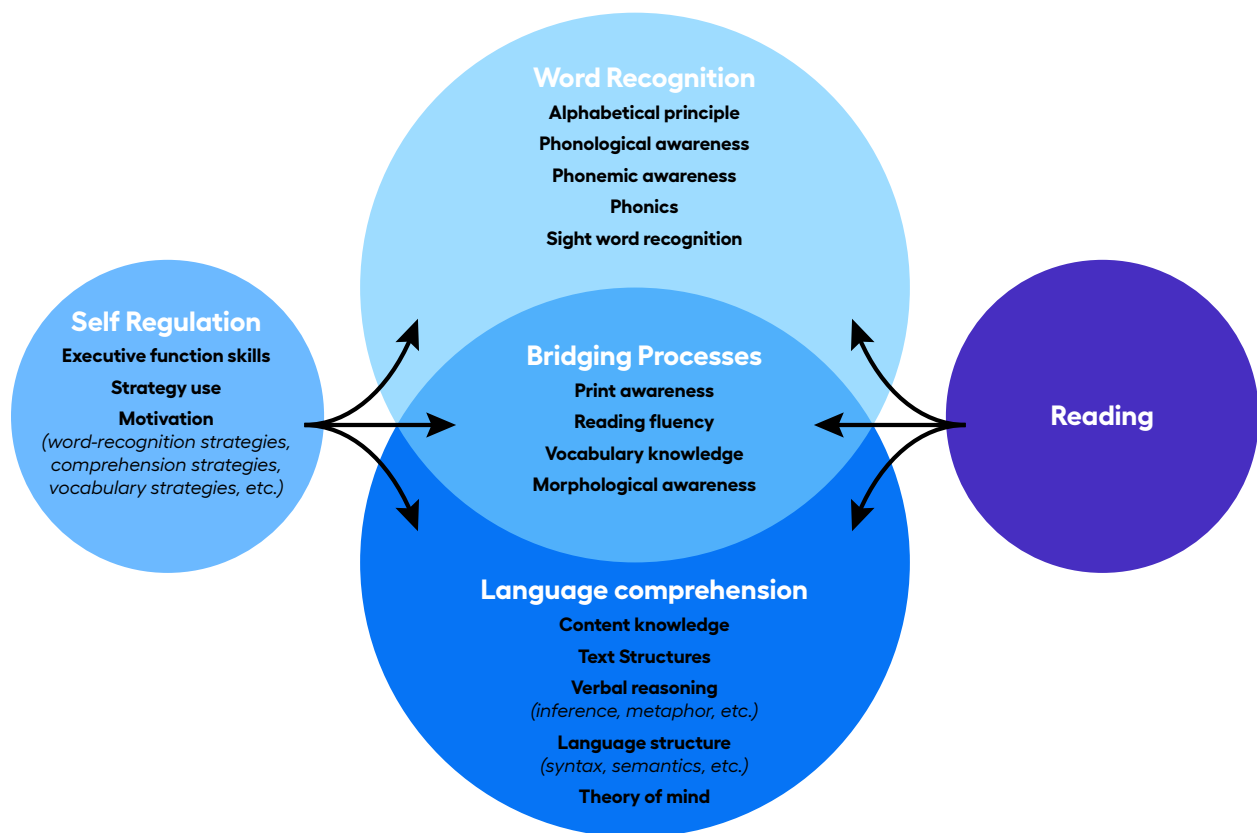
Note: This model is adapted from Duke and Cartwright (2021), Gough and Tunmer (1986), Scarborough (2001), and Cutting et al. (2015) models of reading.

To address this challenge, a growing number of schools turn to digital and blended learning programs that ensure their curricula address the science of reading. Research shows that blending technology with teacher-led instruction can be particularly effective in improving reading achievement (Means et al., 2013). However, simply putting students in front of a computer is not a guarantee of improved reading achievement. To maximize learning, online reading instruction needs to be research-based and practice-tested.

The Imagine Learning EL Education curriculum focuses on the science of reading by explicitly teaching:

- **foundational skills** (alphabetic principle, phonological awareness, decoding, and sight word recognition) that build word recognition;

- **language-comprehension skills** (content knowledge, background knowledge, language structure, verbal reasoning, and theory of mind) that support strategic reading;

- **bridging skills** (print concepts, vocabulary knowledge, morphological awareness, and self-regulation skills) that predict reading; and

- **self-regulation skills** that support fluent, skilled reading.
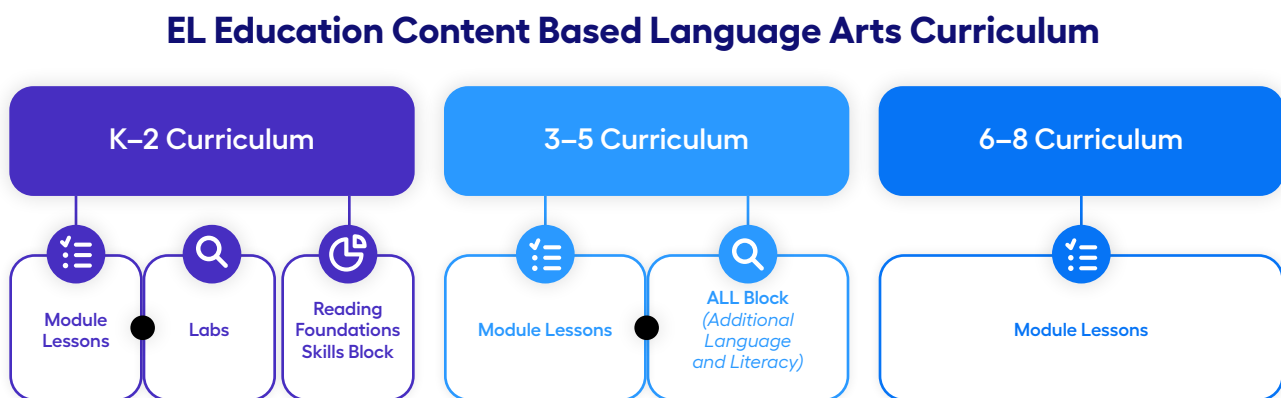
Overview of Imagine Learning EL Education

Imagine Learning EL Education is a comprehensive, digital-first, standards-based, K–8 core language arts program that engages teachers and diverse learners through compelling, real-world content. This content-based curriculum focuses on equity, emphasizes social and emotional learning, and engages students with rich, complex text designed to build deeper literacy skills. Each grade level includes four eight-week modules to help students build content knowledge based on a compelling topic related to science, social studies, or literature. Below is a brief overview of the content covered within each grade band.

The K–2 curricula provide two hours of content-based literacy instruction per day (Module Lessons and Labs) and one hour of structured phonics (the K–2 Reading Foundations Skills Block) per day. Modules explicitly teach oral language development (vocabulary, syntax, and listening skills) and engage students with rich, complex informational and narrative text daily. The K–2 Reading Foundations Skills Block teaches students the building blocks of spoken and written language: letter names, sounds, the ability to break words apart and blend them back together, common spelling patterns, and decoding of words.

The 3–5 curricula provide two hours of content-based literacy and writing instruction per day, grounded in complex informational and narrative text (Module Lessons and the Additional Language and Literacy ALL Block), with an hour of optional Life Science instruction in Module 2. The ALL Block provides additional practice with complex texts through independent reading, speaking fluency (grammar, usage, and mechanics), writing, word study, and vocabulary.

The 6–8 curricula provide 45 minutes of content-based literacy instruction within Module Lessons each day.

Figure 2: *Imagine Learning EL Education Language Arts Curriculum*

EL Education Content Based Language Arts Curriculum

Translating the Science of Research into Action

Imagine Learning EL Education incorporates four research-based practices into its curriculum, all of which are critical to the science of reading.

1. Explicitly Teach Word-Recognition Skills

To read a text successfully, a reader must accurately and effortlessly pronounce and recognize a word (Scarborough, 2001). This requires the ability to map print to sounds—skills related to knowledge of the alphabetic principle, phonological awareness, decoding, and sight word recognition (Castles et al., 2018). Below is an overview of how the EL Education curricula address these skills.

- The **Alphabetic Principle** refers to the systematic, predictable relationship between sounds and letters in print and spoken words. As Vaughn and Linan-Thompson (2004) note, "Children who understand that the sequence of letters in written words represents the sequence of sounds in spoken words and who know letter-sound correspondences can use this knowledge to decode both familiar and unfamiliar regular words" (p. 33). According to Ehri (2005), the development of the alphabetic principle occurs in four phases:
  - **Pre-alphabetic:** Children can identify a few letters in print, but cannot yet identify letter sounds.
  - **Partial-alphabetic:** Children can identify many upper- and lower-case letters and some letter sounds. Children have weak phonemic awareness (confusing vowels and vowel sounds), decoding, and spelling skills.
  - **Full alphabetic:** Children know all major letter-sound correspondences, can blend and segment sounds in a word, have memorized a growing number of sight words, and can decode and encode one-syllable words.
  - **Consolidated alphabetic:** Children know all major letter-sound correspondences, have a large bank of sight words, and can use affixes, root words, onsets, rimes, context, and syllables to decode multisyllabic and irregularly spelled words.

- **Phonological awareness** is the recognition that spoken words are made up of smaller parts such as words, syllables, onsets, and rimes (Gillon, 2018). For example, the **onset** of a word is the initial consonant or consonant blend before a vowel (e.g., /fr/ in frog), and the rime is the word part that follows (e.g., /og/ in frog). Understanding onset and **rime**, as well as rhyming words (families of words that share the same rime), builds students' awareness of common word parts and helps students decode unfamiliar words (Adams, 1990; Hudson, 1996).

- **Phonemic awareness** is the ability to hear, identify, and manipulate the individual sounds in words (Bowey, 2005; Ehri et al., 2001; Gillon, 2018; Hulme et al., 2012). Phonological and phonemic awareness helps readers decode words (Ehri, 1992; Ehri, 2005; Yopp, 1992) and significantly predict word recognition, reading comprehension, and spelling performance (Bradley & Bryant, 1983; Gillon, 2018). Research suggests that effective phonological-awareness instruction should be explicit and systematic, prioritize teaching letter-sound correspondences, and capitalize on interactive word-building activities (Foorman et al., 2016; NICHD, 2000). According to the National Reading Panel (NICHD, 2000), phoneme manipulation, which includes isolating phonemes in words, segmenting words into phonemes, blending and adding phonemes to form words, deleting phonemes from words, and manipulating onsets and rimes is critical to building students' word recognition (Schuele & Boudreau, 2008).

- **Phonics** explicitly highlights the relationship between letter symbols and sounds. **Decoding** is the process of seeing a written symbol and being able to say what sound it represents (Adams, 1990; NICHD, 2000). A large body of research indicates that phonics is the most efficient and effective way to teach the alphabetic principle (NICHD, 2000; Rose, 2006; Rowe, 2005). Effective phonics instruction should explicitly and systematically teach: letter identification, letter-sound correspondence, blending, sound-spelling patterns, word recognition, and encoding (the ability to determine the spelling of a word based on the sounds in the word) (Castles et al., 2018; Foorman et al., 2016; Hudson et al., 2012; NICHD, 2000). The progression should start with major sound-spelling correspondences of consonants, short and long vowels, and vowel and consonant digraphs, and then progress to blends (NICHD, 2000).

- **Sight Word Recognition**—the ability to fluently read irregularly spelled words or words that frequently appear in the English language—is critical to fluent reading (Ehri, 2014; Paige et al., 2019). As Ehri (2005) notes, if readers use all their working memory to "attempt to decode words, to analogize, or to predict words, their attention is shifted from the text to the word itself to identify it, and this disrupts comprehension" (p. 170).

Our Solution: Imagine Learning EL Education's K–2 Skills Block explicitly teaches the alphabetic principle, phonological awareness, phonemic awareness, decoding, and sight word recognition based on Ehri's (2005) developmental phases of reading development. The program systematically progresses from easier phonics skills to more complex skills to ensure students develop a strong foundation before moving on to more difficult concepts.

- In the **Pre-alphabetic Phase**, students identify letters (uppercase and lowercase) and letter-sound correspondence through oral and written texts. An introductory text, titled *Jeffi and the Search for Names*, teaches the most common consonant and vowel sounds (/a/, /t/, /h/, /p/, /n/, /c/, /m/, /r/, /v/, /s/, /g/, /i/, /l/, /d/, /f/, /k/, /y/, /x/, /q/, /u/, /b/, /o/, /w/, /j/, /e/, and /z/). As students hear the names of creatures and objects the story characters encounter, students practice letter mnemonics, phoneme identification, letter name, sound formation,

and rhythm of speech. Feel the Beats lessons focus on letters. Students practice counting, pronouncing, identifying, segmenting, and manipulating first, last, and middle syllables in these lessons. To help them learn about word families and recognize chunks of words, students play multisensory rhyming games, in which they learn to attend to onsets and rimes. For example, in *Color-Coded Rhymes* and *Rhyme a-Lot-Bot*, students identify, sort, and color pictures that rhyme with each other. They also practice blending onsets with rimes to determine whether the blends make real words.

- In the **Partial-alphabetic Phase**, students learn how the 44 speech sounds of English can be written with graphemes. Students learn consonant digraphs (ch, sh, th, wh, ck, and ng), spoken short vowels (/a/, /i/, /u/, /o/, and /e/), long vowels sounds, r-controlled vowels, –ank and –ink, initial/consonant blends (–bl, –br, –cl, –cr, –dr, –fr, –tr, –fl, –gl, –gr, –pl, –pr, –sl, –sm, –sp, and –st), and consonant clusters (–st, –nt, –nd, –nk, –ng, –ll, –ss, –ff, and –zz) in spoken words. As students progress through modules, they encounter more complex sound-spelling patterns, such as –nch, –ang, –ing, –ung, –ong, –ank, –ink, –unk, and –onk, and learn to use suffixes (e.g.,. –s, –ing, –ed, and –es) to identify word parts. Broader phonological-awareness instruction then shifts to phonemic awareness, where students learn to segment and blend phonemes to decode and encode VC (vowel consonants), CVC (consonant vowel consonant), and CVCC (consonant vowel consonant consonant) words. For example:

- In the Reading Foundations Skills Block Grade 1, Module 1, students listen as the teacher reads the poem, *Open a Book, Unlock a Door*. The teacher asks what vowel sound is heard in the word "lands." This process is repeated throughout the poem. Next, students have the option to complete a short vowel picture sort found on the Activity Bank page. Students sort twelve pictures by the long and short vowel sounds, with two, three, and four phonemes.

  ○ In the Reading Foundations Skills Block Grade 1, Module 1, students segment words before writing the words. The teacher says the words "van, path, math." Students segment each word by pronouncing the phonemes. Students receive ample opportunities to practice foundational reading skills, including deleting phonemes within words.

  ○ In Skills Block Kindergarten, Module 4, students explore phonemic substitution in –ink words including pink, wink, etc. Lessons provide engaging realia (images and multimedia). Teachers use sample phrases such as, "Did you know that we can make new words by switching one of the letter sounds with a different letter sound?" to help students attend to word parts. In addition to clear instructional materials and student-facing materials, teachers have access to additional reference materials like Articulatory Gestures Charts to explicitly teach students proper mouth positioning with letter and sound formation.

Figure 3: *Kindergarten Phonemic Substitution Activity*

Let's Work with Words! ˅

Teaching notes

Suggested Pacing: 4 minutes

Directions:

Begin the Phoneme Blending and Segmentation Instructional Practice:

1. Say:

- *"Did you know that we can make new words by switching one of the letter sounds with a different letter sound?*
- *So if we start with a word we know, we can make some new words just by changing one letter sound.*
- *Let's start with the word 'pink'. We'll make new words by changing just the first sound."*

2. Say: *"pink,"* and students repeat.

3. Say:

- *"I know the first sound in the word 'pink' is …"* (Wait for students to reply with /p/.)

Students learn high-frequency words from the Dolch and Fry word lists (high-frequency sight words), including regularly and irregularly spelled words. They practice identifying and decoding sight words through engaging, interactive activities:

- Students play a game in *Sight Word Parking Lot* that requires reading a word correctly to successfully "park" their car in a parking space.
- In *Clothes Pin Match*, students match and read the letters on a popsicle stick by matching clothespin letters to the sight word written on each stick (e.g., the, of, to, you, she, my, is, are, do, and does).
- In *Fishing for Sight Words*, sight words are written on cutout paper fish. Each child is given a "fishing pole" with a string and a magnet on the end. Students go fishing for sight word fish and keep them if they are read correctly.
- In *Sight Word Hopscotch*, students demonstrate their ability to read high-frequency words while playing digital hopscotch.

Imagine Learning EL Education Language Arts Kindergarten Phonemic Substitution Activity

- In the **Full Alphabetic Phase**, students learn to identify and use closed syllables (a syllable that has a short vowel ending in a consonant), open syllables (a syllable that ends with a vowel sound that is spelled with a single vowel letter), CVC spelling patterns (consonant, vowel, consonant, and then the letter e), r-controlled sounds (e.g., /ar/, /or/, and /er/) and vowel teams ("ai," "ea," "oa," "ay," "ow," "ee," "-y," "igh," and "ie") to decode and encode one-syllable and then two-syllable words. For example, in one lesson, students learn that the consonant -le syllable is a final syllable with one consonant followed by l and a silent e. These syllables occur at the end of the word and have no vowel sound. In Grade 2, Word Workout: Same Sounds, students work with a partner to complete exercises with C-le endings and decide if each word is spelled with the following endings: –dle, –ble, –fle, –ple.

  Students also learn that different graphemes and letter combinations can make up the same sounds. In Grade 2, Cycle 3, Lesson 13, teachers use the Word Rules instructional practice to review /ē/ words spelled with "ee," "ea," and "y." To begin, the teacher reads /ē/ words in random order: "need," "squeeze," "peach," "dream," "party," and "happy." Next, students work with a partner to review the /ē/ word rules (in "ee" and "ea" words, the vowel sound is in the middle of the syllable and followed by a consonant sound). They also review the "y" sound at the end of words. Finally, students take turns reading the words and then writing the words they hear using the Word Rules Word Cards and whiteboards.

- In the **Consolidated Phase**, students engage in deep word analysis. They learn spelling rules to help them generalize spelling patterns for vowel teams and affixes, and that there are many words in English for which rules do not apply (e.g., "turn," "her," and "bird" all have the /er/ sound but are all spelled with different vowels). Students also apply new spelling patterns ("oi," "oy," "ou," and "ow"), common prefixes (re–, un-, and–, pre–), suffixes (–ed, –ing, and –er), contractions, and word endings such as –tion and –sion to decode words. They also spell words from dictation and practice using encoding strategies while writing words (e.g., using sound-letter-sound relationships, applying spelling rules and conventions, capitalizing on knowledge of root words and affixes, and utilizing word parts to spell words).

2. Explicitly Teach Language-Comprehension Skills

In addition to word-recognition skills, a reader needs "fluent execution and coordination of language comprehension skills (content knowledge, text structures, verbal reasoning, language structure, and theory of mind) to make meaning from a text" (Scarborough, 2001, p. 98).

- **Content Knowledge:** Cognitive psychologists and reading researchers agree that readers need to integrate text information with prior content knowledge to successfully understand text (Adams, 2009; Cabell & Hwang, 2020; Lee & Spratley, 2010; Torgesen et al., 2007). In fact, decades of research show that content knowledge significantly contributes to reading comprehension (e.g., Cabell & Hwang, 2020; Recht & Lesley, 1988; Smith et al., 2020). Cabell and Hwang (2020) note content knowledge is predictive of reading comprehension because it helps students connect ideas across sentences and make inferences about missing information in passages. According to Adams (2009), knowledge builds knowledge—that is, the more one knows about a topic, the more one can read and understand about the topic. In fact, weaker readers with strong content knowledge could compensate for generally poor comprehension skills (Recht & Leslie, 1988). However, content knowledge is only useful when it can be organized into a schema, contextualized, and transferred to other contexts (National Research Council, 2000).

Our Solution: Imagine Learning EL Education intentionally builds student content knowledge through the program's Module Lessons, Labs, and ALL Block lessons. The program's foundation is hour-long Module Lessons that expose students to authentic texts related to a diverse array of science, social studies, and literature. For example, Grades K–5 passages' range of age-appropriate topics includes toys and play, birds and plants, frogs, and human-rights stories.

Within each grade level, students complete four modules per year. There are three units within each module. In the K–5 materials, the first unit activates students' prior knowledge to help them connect new knowledge to known knowledge by asking students to recall and verify prior learning. This prompts thinking about a subject, connects a topic to students' own lives, challenges students to reflect on a new idea,

Figure 4: *Grade 7 Harlem Renaissance Lesson*

or poses a compelling problem. For Example, in a lesson on the Harlem Renaissance, the teacher asks why a 1914 magazine by a Black American would portray justice as blind (Figure 4). The 6–8 materials are connected and organized into modules with grade-level-appropriate topics. At the beginning of each module, guiding questions and big ideas are presented to build content knowledge and thematically tie anchor texts together.

The K–2 program contains a third instructional block, focusing on Labs, facilitating knowledge transfer to new contexts. For example, in Grade 2, Module 1, students study schools and why they are important. They read the anchor text *Off to Class: Incredible and Unusual Schools Around the World* by Susan Hughes to learn about various international schools and the challenges some communities face sending their students to school. In the Module 1 Performance Task, students create an informative book about the most important elements of a school. The four Labs for Module 1 provide additional opportunities to apply content knowledge in new settings. For example:

- In the **Create Lab**, students draw portraits of important school community members as they learn how to use artistic skills and concepts such as features of a face, shapes, and details.

- In the **Engineer Lab**, students think creatively to design an ideal space for their school. Then, as students learn what makes schools important in the Module Lessons, they can apply that learning to their reasons for designing their school space.

- As students learn about the similarities and differences among schools across the globe, they use the **Imagine Lab** to act out and understand the critical parts of schools, no matter where they are.

- The **Research Lab** allows students to learn more about their school community by conducting surveys of the people in their schools.

The Grade 3–5 ALL Block further facilitates content literacy through reading. For example, in Grade 4, Module 1, students read texts about how monarch butterfly, armadillo, ostrich, springbok, and robin bodies and behaviors help the animals survive. During the corresponding ALL Block lessons, students read three additional engaging texts about animal defense mechanisms: *Animal Behavior: Animal Defenses* by Christina Wilsdon, *Venom* by Marilyn Singer, and *Can You Survive the Wilderness?* by Matt Doeden. They also read free-choice texts on any topic of their interest. They log their reading, respond to reading prompts in independent-reading journals, and share their learning from reading in a group discussion. These activities facilitate vocabulary development and the expansion of content knowledge.

- **Text Structures:** Text structure refers to the way authors organize words, pictures, and ideas within a text. Because text structures follow a predictable format, understanding text structure can help students more quickly organize the information and details they are learning, identify the important elements in a passage, show how parts of a text relate to each other, make logical predictions, and monitor comprehension (Zimmerman et al., 2018). Research shows that explicitly teaching text features for narrative texts (e.g., characters, setting, conflict, plot, resolution, and theme) and informational texts (e.g., description, chronology, comparison, problem/solution, and cause/effect) improves reading compre-hension and recall from texts (Hebert et al., 2016; NICHD, 2000).

Our Solution: Imagine Learning EL Education teaches students the structural features and conventions of informational texts (e.g., biographies, news articles, essays, speeches, technical writing, and other forms of expository writing) and literary texts (e.g., children's adventure stories, folktales, historical fiction, legends, mysteries, fables, fantasy, poetry, and realistic fiction). For example:

- ○ In Grade 2, Module 3, an informational-text lesson teaches students to use a table of contents, headings, captions, diagrams, labels, bold print, glossaries, and photographs to locate information about plants and pollinators (see Figure 5).

- ○ When fifth-grade students read *The Most Beautiful Roof in the World* by Kathryn Lasky in Module 2, they learn to look for signal words for a problem-solution text (e.g., the problem is, the dilemma is, solved, one challenge, and this led to). Then, after filling out a graphic organizer, they note that while the rainforest is difficult to study, skilled scientists developed new technology and ways to study the canopy (Figure 6). Additional passages provide practice analyzing descriptive, chronological, comparison, and cause-and-effect text formats.

- ○ Lessons also explore features of literary and narrative texts, including story elements (character, setting, and major events), characterization, conflict, theme, voice, point-of-view, figurative language, and poetic structure. For example, in Grade 6, Module 3, students read the anchor text, *Two Roads* by Joseph Bruchac, and analyze the main character's response to prejudice and privilege at a Native American boarding school and what that reveals about his character.

Figure 5: *Grade 2 Informational Text Lesson*

Let's Discuss! ⌄

Text Features

Text Feature	How It Helps the Reader Find Information Efficiently
Table of Contents	Helps you find where to read
Headings	Tells you what a section of text is about
Captions	Gives information about a photograph, illustration, or diagram
Diagram	A picture that shows the parts of something or how it works
Label	Names a part of something
Glossary	Tells what a word means

Teaching notes

Suggested Pacing: 2 minutes

Directions:

- Direct students' attention to the **Text Features Anchor Chart** and briefly review it.
- Share that today, they will continue using text features efficiently to learn new information about plants. They will also discover the meaning of unknown words and think about how different information in the text is connected.

Figure 6: *Problem and Solution Text Structure Lesson*

Problem and Solution Structure: *The Most Beautiful Roof in the World*, Pages 9–10 Graphic Organizer

*How does the way a text is structured support our understanding of complex ideas?

Text:

PROBLEM

SOLUTION

Evidence that explains at least two ways scientists overcome the problem:

- What is the problem?

- Complete the solution box on your graphic organizer with your partner.

- Explain that in this box, they should write ways scientists have solved or overcome the problem, according to the text.
- Circulate to support students as they work.
- Refocus whole group and select volunteers to share solutions they recorded with the group.

Possible Student Responses:

- The rainforest canopy is difficult to study.
- Refer to the **Problem and Solution Structure:** *The Most Beautiful Roof in the World*, **Pages 9–10 Graphic Organizer (Answers, for Teacher Reference)** as necessary.

‹ Previous   Next ›

- **Verbal Reasoning:** Verbal-reasoning skills—drawing conclusions based on information that has been implied rather than stated—predicts reading comprehension (Elleman, 2017). Research shows that effective verbal-reasoning instructional techniques include teaching students to interpret the nonliteral meanings of metaphors and figurative speech (Duke & Cartwright, 2021) as well as instructing students to "use their background knowledge and integrate it with the information in the text, self-generated elaborations, graphic organizers that connect concepts, and text clues" (Elleman & Oslund, 2019, p. 5).

Our solution: Imagine Learning EL Education explicitly teaches verbal-reasoning skills. Students learn to make inferences about the meaning of words, ideas within sentences, and ideas within and outside texts. At the beginning of each unit, students use the Infer the Topic Protocol that links what they already know about a text and what images or words help them gain new information about a module topic. The program shows how to use linguistic cues and facts stated in a text to uncover the meaning of unfamiliar words. Students learn to make global inferences based on ideas expressed in different sentences or passages in a text. For example, in Grade 8, Module 4, students make connections among—and distinctions be-tween—individuals, ideas, and events in the book *Farewell to Manzanar*. Sixth-grade students read excerpts from *The Lost Garden and Dragon Wings* to infer Laurence Yep's perspective on the police. In a Grade 5, Module 1 lesson, students make connections between the books *Esperanza Rising, The Universal Declaration of Human Rights,* and *A Life Like Mine*.

Imagine Learning EL Education also teaches students to identify and interpret figurative language (idioms, metaphors, and similes) in context (Figure 7).

- In Grade 4, students explore how authors use idioms (expressions whose meanings are not predictable from words) by analyzing phrases such as "drop like flies" or "to add insult to injury."

- They investigate how authors use metaphors to communicate their message more clearly and vividly. For instance, a Grade 5, Module 1 lesson introduces metaphors by discussing the phrase "the elephant in the room." Students learn that the elephant refers to a large, conspicuous problem no one wants to talk about because it is too uncomfortable. They then analyze metaphors in books such as *Esperanza Rising* by Pam Muñoz Ryan, *The Great Kapok Tree* by Lynne Cherry, and *Eight Days: A Story of Haiti* by Edwidge Danticat.

- In Grade 4, Module 4, students explore how the simile, "I was sold and willed and bartered about like so much livestock", in the book *Hope Chest* by Karen Schwabach, means the character was treated badly (sold like a farm animal rather than treated like a human).

Figure 7: *Figurative Language and Inferences*

- Language Structure: To read successfully, readers need to understand how language is organized to convey meaning (Duke & Cartwright, 2021). Research shows that syntactic awareness (awareness of the grammatical structures of a sentence) and pragmatics (communicative competence) significantly contribute to reading proficiency (Mokhtari & Niederhauser, 2013)

Our Solution: Imgagine Learning EL Education develops students' understanding of how syntax and semantics dictate sentence meaning. The K–2 Module Lessons explicitly teach the function of nouns, pronouns, verbs, adjectives, conjunctions, prepositions, and adverbs, and students analyze these parts of speech in sentences, songs, and poems. In the Grades 3–5 ALL Block lessons, students practice conventions of written English, including usage, mechanics, capitalization, and punctuation. Knowledge of standard writing conventions and spelling is deepened through short and fully developed writing assignments.

Teacher-facilitated Language Dives help students analyze the meaning, purpose, and language structure of a compelling sentence from a complex text. These structures within the sentence help students learn grammar, syntactical constructions, word groupings, and idiomatic expressions. For example, a Grade 3, Module 4, Language Dive helps students better understand the role of conjunctions and adverbs. Students learn that conjunctions are parts of speech that join two words or phrases together. They also learn that adverbs are words that can modify a verb, adjective, or another adverb, and that they tell us how, when, where, why, how often, or how much the action is performed. Students then read the sentence, "Because water is not evenly distributed across the globe, nearly one-fifth of the world's population does not have access to

enough water." They explore what would happen if the words *because, evenly,* and *nearly* were removed. For instance, if the word *because* were removed, the sentence would not make sense; students separate the first and second parts into two distinct sentences. Without the word *evenly,* the sentence implies that water is not distributed globally (which does not make sense because water is everywhere). Students then replace the words *evenly* and *nearly* with other adverbs without changing the meaning of the sentence: *Because water is not _____ distributed across the globe, _____ one-fifth of the world's population does not have access to enough water.* During the Language Dives, teachers help students notice effective communication, and common grammar mistakes and errors that interfere with speech and writing.

The program also builds students' social-language skills through texts they are reading and materials they are learning. Because each lesson requires conversation with peers, students get practice narrating a story, explaining an event, giving directions, or persuading someone in an argument. In addition, students learn to consider context and culture to have productive and equitable conversations with peers.

- **Theory of Mind:** In addition to word-recognition and language-comprehension skills, "understanding a text requires that we put ourselves in the mindset of the [text's] characters" (Dore et al., 2018). This necessitates having a theory of mind, or an understanding that other people have different mental states that drive their actions. It also requires the knowledge that others may have beliefs or perspectives that differ from one's own (Premack & Woodruff, 1978). Being able to make social inferences about characters' thoughts, feelings, and intentions contributes to reading (Guajardo & Cartwright, 2016).

Our Solution: Imagine Learning EL Education teaches students that individuals have their own diverse thoughts and beliefs, and that these perspectives could be different from their own. Through the instruction, students are given opportunities to explore diverse perspectives and how their perspectives might change after reading a text or discussing a topic with their peers. For example, in Kindergarten, Module 1, students explore how people have varying toy and game preferences (Figure 8).

Figure 8: *Kindergarten Theory of Mind Lesson*

In Grade 6, Module 3, students analyze characters' thoughts, feelings, actions, and reactions (and why they have them) while reading the compelling text, *Two Roads* (Figure 10). Learners make predictions and then read on to see if those predictions were correct. They also dissect how characters' actions contribute to events in texts and how these behaviors impact others around them.

Figure 9: *Grade 6 Theory of Mind Lesson*

Analyze Character: Two Roads Note-Catcher

Directions: Track the challenges Cal faces and how he responds and changes as a result.

Chapter(s)	What challenges does Cal face in this chapter?	How does Cal respond to or change as a result of those challenges?	What do those responses or changes reveal about his character?
4-5			

3. Explicitly Teach Bridging Skills

Duke and Cartwright's (2021) synthesis of reading research indicates that four constructs—print awareness, reading fluency, vocabulary knowledge, and morphological awareness—make a direct and large contribution to reading comprehension by themselves, and directly contribute to word recognition and language comprehension. Because these bridging skills are malleable and have been implicated in reading difficulty, experts agree they should be explicitly taught (Duke & Cartwright, 2021).

- **Print Awareness:** Research indicates that print awareness—having a basic understanding of how letters, words, sentences, and books function—is highly predictive of language comprehension, word recognition, and reading achievement (Adams, 1990; Clay, 2005; National Early Literacy Panel, 2008; Scarborough, 1998; Teale & Sulzby, 1986; Wagner et al., 1997). Yet, many students do not come to school with an understanding of basic print concepts (Clay, 1985). As such, experts recommend explicitly teaching struggling students the conventions of printed language, such as how to locate the front and back of a book, identify letters and words, notice when words and letters are out of order, and recognize sentence punctuation (NICHD, 2000).

Our Solution: Imagine Learning EL Education teaches students concepts of print, such as left-to-right directionality, through various stories, poems, and other shared texts. They learn that written sentences start with capital letters and end with full stops, and that the spacings between words, sentences, lines of print, and paragraphs follow a meaningful pattern.

- **Reading Fluency:** The National Reading Panel defines fluency as the ability to read words and text "with speed, accuracy, and proper expression" and phrasing (NICHD, 2000, p. 3-1). Reading fluency facilitates word recognition and reading comprehension because "it releases a reader's cognitive resources (e.g., working memory) to focus on meaning" (Duke & Cartwright, 2021). Effective fluency strategies include modeling fluent oral reading, asking students to read a text aloud and having a teacher provide feedback, and engaging in repeated oral readings of text (Hudson et al., 2005; Marshall & Campbell, 2005; NICHD, 2000; Rasinski, 2004).

Our Solution: Imagine Learning EL Education teaches students to decode and read texts with automaticity and fluency. As students progress through the program, they interact with increasingly difficult text and read complex and decodable passages multiple times (reading themselves or hearing them read aloud). Students learn specific criteria for reading fluency by watching teachers read connected text out loud. Educators model reading text smoothly, with meaning, and at the right speed, as well as making corrections as they read (Figure 11). Students read with a partner or practice reading in small groups where they receive peer and teacher critiques. K–2 students recite poems and songs across multiple lessons. In Grades 3–5, students self-assess their fluency skills during ALL Block (Figure 12). Students

in Grades 6–8 read as part of a performance (e.g., podcasts, documentary voiceover, audio museum). The program capitalizes on assisted reading, choral reading, shared reading, and paired reading to improve prosody and expression. In K–2, the Skills Block program includes benchmark, cycle, and snapshot assessments that measure students' fluency and reading comprehension.

Figure 10: *Grade 2 Reading Fluency Lesson*

Figure 11: *Grade 3-5 Fluency Self-Assessment Checklist*

Reading Fluency Self Assessment Checklist

Directions: Self-assess where you are with each of the criteria on your checklist by tapping the appropriate column.

	4 Advanced	3 Proficient	2 Developing	1 Beginning
I can read all/almost all of the words correctly.	○	○	○	○
I can correct myself and reread when what I read was wrong or didn't make sense.	○	○	○	○
I can read at a speed that is appropriate for the piece.	○	○	○	○
I can read smoothly without many breaks.	○	○	○	○
I can read groups of related words and phrases together.	○	○	○	○
I can notice and read				

- **Vocabulary Knowledge:** Research shows that vocabulary predicts decoding, listening comprehension, and reading comprehension (Cunningham & Stanovich, 1997; Duke & Cartwright, 2020; Elleman et al., 2009; Perfetti, 2010; Stahl & Fairbanks, 1986; Tunmer & Chapman, 2012; Wagner & Meros, 2010). Beck et al. (2013) found that effective vocabulary instruction: (a) teaches Tier 2 high-utility academic words and Tier 3 content-specific words; (b) introduces words using everyday language and avoids dictionary definitions; (c) presents words in multiple contexts; (d) provides multiple exposures; and (e) teaches word-learning strategies. Students who read a series of texts on the same topic demonstrate greater vocabulary growth than those who read the same amount of texts on different topics (Cervetti et al., 2015; Landauer & Dumais, 1997; Pimentel & Liben, 2021).

Our Solution: Imagine Learning EL Education builds academic and content-specific words throughout lessons and multiple reads of compelling text. For example:

- At the start of all lessons, educators explicitly teach students academic vocabulary words while unpacking learning targets related to standards (e.g., *determine* the main idea and *build* on another's idea).

- Interactive word walls, word maps, vocabulary logs, graphic organizers, illustrations, and Frayer Models enhance student understanding through examples and non-examples of critical words. For example, in a Grade 8 lesson, students learn the meaning of the word *infer*. The program provides visuals and asks students to make an inference about them. Examples include a broken window with a baseball next to it (someone threw a baseball and shattered the glass) and a dog covered in mud (the dog played in the mud and got dirty).

- Students have opportunities to work with words through various learning formats (e.g., text, poems, plays, artwork, and songs).

- Students apply newly learned word knowledge in writing assignments.

- During close reading of texts, students explore and write their own definitions of words within a text's context. Text-dependent questions ask students about the meaning of words and how the words convey the author's point of view.

- The program intentionally teaches students to become "word detectives" and apply strategies (e.g., using contexts, past learning, or word parts such as word roots and affixes) to uncover the meanings of unknown words and multiple-meaning words.

- Collaborative conversations and K-2 Labs provide opportunities for students to use content-specific and academic vocabulary while applying speaking and listening skills taught in the lesson.

- The K-2 Skills Block curriculum includes word inventories that can assess students' knowledge of spelling patterns and high-frequency words for grouping and differentiation of instruction.

- Vocabulary protocols and routines make domain-specific and general academic words come alive for students through creating meaningful context, connecting new words to the previous schema, and repeating shared use of the words. Vocabulary protocols and strategies also help students understand that acquiring new words is an active process requiring interaction and application.

- **Morphological Awareness:** A large body of research shows that morphological awareness—the ability to recognize and manipulate words into smaller parts such as prefixes, suffixes, roots, or base words—directly facilitates vocabulary development, word recognition, and reading comprehension (Bowers et al., 2010; Duke & Cartwright, 2021; Goodwin & Ahn, 2013; NICHD, 2000; Tighe & Binder, 2015; Zhang & Ke, 2020).

Our Solution: Imagine Learning EL Education explicitly teaches students how to use roots, prefixes, and suffixes as a strategy to uncover the meaning of unfamiliar words across all grade

levels. For example, students in Grades K–2 participate in the interactive *Base Word Bingo* activity, in which they demonstrate the ability to match inflectional endings with base words to make new words. In *Inflection Match-Up,* students practice creating and reading words with inflectional endings by blending base words with various inflectional endings. Students then determine if a word is real and, if so, record that word. In *Find the Ending*, they circle the suffixes and underline the base words in words provided by the teacher. During the Grades 3–5 ALL Block, students participate in context-driven Word Study four times a week, every other week. For example, in Grade 3, Module 2, students learn that their conclusion paragraph must include a restated focus statement. The teacher writes "restate" on the board, points to the prefix "re-," and asks students to read other words with the same prefix. The teacher then asks: "What do you think re– means based on how it is used in each of these words?"

4. Explicitly Teach Self-Regulation Skills

In addition to word-reading and language-comprehension knowledge and skills, skilled reading requires readers "to regulate themselves, actively coordinate the various processes and text elements necessary for successful reading, deploy strategies to ensure reading processes go smoothly, maintain motivation, and actively engage with text" (Duke & Cartwright, 2021, p. 520). Furthermore, a large body of research shows that self-regulation skills such as executive functioning, motivation, and strategy use help explain differences in reading abilities (Liew et al., 2020).

- **Executive Function:** Studies show that executive functioning skills—working memory, cognitive flexibility, and self-control—directly predict reading comprehension. Working memory is the limited-capacity "brain system that provides temporary storage and manipulation of the information necessary" to remember and execute "complex cognitive tasks" (Baddeley, 1992, p. 556). Cognitive flexibility is the ability to adapt thoughts or actions as demanded by the situation (Cragg & Nation, 2010). Inhibitory control is the ability to filter out distracting information irrelevant to a task (Kieffer et al., 2013). These factors contribute to reading competence "because reading requires the ability to direct attention to particular aspects of text (attentional control), build and maintain a model of text meaning while decoding the words in the text (working memory), suppress distracting information (inhibitory control), shift continuously between key processes (cognitive flexibility), and plan and manage one's progression toward the goal of a reading task (planning)" (Duke & Cartwright, 2021, p. 530).

- **Motivation:** Research shows that motivation predicts variance in reading ability, above and beyond academic and cognitive skills, among Grades K–12 students (Guthrie et al., 2012; Ryan & Deci, 2002; Toste et al., 2020). As Brandt and colleagues (2021) note, "When students have little motivation to read, they read less, spend less time with texts, and are slower to develop early skills such as decoding and fluency" (p. 723). Students who are motivated demonstrate greater conceptual understanding, exhibit higher satisfaction with school, and have more confidence than unmotivated students (Guthrie, 2002; Schunk &

Zimmerman, 2012). Experts have identified several practices that promote students' reading motivation (Brand et al., 2021; Gambrell, 2011; McRae & Guthrie, 2009; Ryan & Deci, 2017). These include presenting students with reading activities that are authentic and relevant, offering meaningful choices to students, fostering students' feelings of competence and self-efficacy, promoting relatedness (relationships with students and teaches), emphasizing mastery goals, and strengthening student autonomy. More specifically, choosing high-interest texts that build upon students' interests can also foster a value for reading (Guthrie et al., 2007). Moreover, setting achievable goals and monitoring progress can increase motivation (Dignath & Büttner, 2008).

- **Strategy Use:** Duke and Cartwright's (2021) synthesis of research suggests that training students to use vocabulary strategies (Wright & Cervetti, 2017), word-learning strategies such as decoding (Lovett et al., 2000), and comprehension strategies (Okkinga et al., 2018) can help students attain higher levels of reading comprehension. To facilitate self-regulated learning and reading comprehension, research suggests teaching students to identify the main idea of a passage, and monitoring their comprehension and ability to visualize, make inferences, summarize, self-explain, self-evaluate, and answer questions about the text (Duke et al., 2011; Marchand-Martella et al., 2013; Okkinga et al., 2018). In addition, engaging students in multiple reads of short, complex texts, facilitating rich discussions based on worthy text-dependent questions, and revisiting and annotating the text all help students learn to extract meaning from text (Fisher & Frey, 2015).

Our Solution: Imagine Learning EL Education engages students in activities that are designed to build self-regulation skills. For example:

- **Executive Function:** Imagine Learning EL Education's curricula include activities that build students' working memory, promote cognitive flexibility, and teach self-control. The program deliberately breaks new information into smaller pieces to help boost students' working memory. Teachers use checklists and routines that foster fluent, automatic reading, and students have multiple opportunities to apply flexible thinking and adapt their behavior or reasoning to tasks in various contexts. The program promotes inhibitory control by teaching students different ways to stay focused when they need to be productive. Techniques include creating a calendar and deciding which assignments are most pressing, completing tasks when energy levels are highest, setting a timer, and doing something active when distracted.

- **Motivation:** Imagine Learning EL Education's curricula help motivates students to engage in reading and comprehend texts.
  - The program optimizes relevance with various informational and literary text sets that reflect genres, including literary texts, mythology, speeches, informational articles, primary-source accounts of historical events, and other historical documents. These texts feature diverse authors, time periods, and characters to meet the goal of attending to students' diverse cultural and experiential backgrounds. For example, texts focus on past and

relevant issues, including gender roles, working conditions, refugee experiences, and access to schooling and education around the world. In addition, the representation of diverse characters means that students see themselves and the perspectives of others in the texts they read. In Grade 7, Module 1, for example, students explore the experiences of people of South Sudan during and after the Second Sudanese Civil War, building practice using textual evidence to support ideas in their writing. The unit assessment asks students to demonstrate their ability to cite textual evidence that articulates perspective in an informational text, specifically regarding how history and culture affect social identity. Similarly, in one Kindergarten, Module 4, students build on their scientific knowledge of trees from the previous module by exploring the importance of trees to people in various communities. Students learn how different people, both real and imaginary, enjoy and appreciate trees, and consider how real people and characters have used trees to fill a need in their community. They read and analyze the texts, *A Tree for Emmy* by Mary Ann Rodman, *Mama Miti: Wangari Maathai and the Trees of Kenya* by Donna Jo Napoli, and *Oliver's Tree* by Kit. Students also write about the different ways trees can be enjoyed in their Enjoying Trees Journal, Part I.

○ Student choice is emphasized throughout the lessons. Students are given multiple opportunities to independently select and read books of their choosing. They also study how characters' decisions and their own choices have consequences. For example, after reading The *Omnivore's Dilemma*, Grade 8, Module 2, students study how their choices about food contribute to a better world.

○ Imagine Learning EL Education builds student competency and relatedness through engaging in group discussions and projects. Lesson notes provide guidance on how teachers can provide explanatory feedback that encourages persistence, resilience, and a learning growth mindset.

○ The curriculum emphasizes mastery, from the learning targets that start every lesson to protocols that engage students in academic discourse, to debriefs that ask students to reflect on their learning and habits of character. In addition, the program teaches students to set goals, control attention, self-monitor, organize, and reflect.

○ The curriculum strengthens student autonomy by providing multiple practice opportunities, and provides teachers with suggestions for scaffolds to support students as they learn new content (these scaffolds can be found in the Teaching Notes of each lesson). The program also teaches students strategies for approaching passages, such as identifying the passage's structure by determining how the key ideas connect or, when reading an informational text, determining what the headings tell the reader about each section.

• **Strategy Use:** Imagine Learning EL Education teaches students vocabulary strategies (e.g., breaking down sentences and using word parts and context clues to find the meaning of words), decoding, and a wide variety of comprehension strategies. For example, students are taught pre-reading strategies (previewing the text, accessing prior knowledge,

formulating questions, clarifying understanding, setting a purpose, and making predictions), during-reading strategies (visualizing, making connections, monitoring understanding, making inferences, rereading, questioning, and summarizing), and after-reading strategies (comparing, synthesizing, and drawing conclusions). Throughout lessons, students engage in a structured, close reading process that requires them to read passages multiple times and answer text-dependent questions about what the text says, how it works, and what it means. During the first read, students determine the gist (their initial sense of what the text is mostly about) and then focus on key vocabulary (e.g., focusing on the prefix "un" in the word "unemployment" and using dictionaries and their Affix List to help them determine the meaning of "favorable" in this context). Students then read, think, talk, and write about a text with a partner and then share to check for and deepen understanding. Along the way, students learn to underline key ideas, circle confusing or unclear words, and create margin notes. Lessons that include close reading feature Close Read-Aloud Guides (Grades K–2) or Close Reading Guides (Grades 3–8).

Conclusion

Imagine Learning EL Education's content-based curriculum was built on best research practices, including well-accepted research from cognitive science and the science of reading. In addition, the program explicitly teaches students word recognition, language-comprehension skills, bridging skills, and self-regulation skills to ensure reading success.

References

Adams, M. J. (1990). *Beginning to read: Thinking and learning about print.* MIT Press.

Adams, M. J. (2009). The challenge of advanced texts: The interdependence of reading and learning. In E. H. Hiebert (Ed.), *Reading more, reading better* (pp. 163–189). Guilford Press.

Baddeley, A. (1992). Working memory. *Science*, 255(5044), 556–559. https://doi.org/10.1126/science.1736359

Beck, I. L., McKeown, M. G., & Kucan, L. (2013). *Bringing words to life robust vocabulary instruction, 2nd Ed.* Guilford Press.

Bowey, J. A. (2005). Predicting individual differences in learning to read. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 155–172). Blackwell Publishing. https://doi.org/10.1002/9780470757642.ch9

Bowers, P. N., Kirby, J. R., & Deacon, S. H. (2010). Effects of morphological instruction on literacy skills: A systematic review of the literature. *Review of Educational Research, 80*(2), 144–179.

Bradley, L., & Bryant, P. (1983). Categorizing sounds and learning to read: A causal connection. *Nature, 301,* 419–421.

Brandt, L., Sharp, A.C., & Gardner, D.S. (2021). Examination of teacher practices on student motivation for reading. *Reading Teacher, 74*(6), 723–731. https://doi.org/10.1002/trtr.1999

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

Cantor, P., Osher, D., Berg, J., Steyer, L., & Rose, T. (2018). Malleability, plasticity, and individuality: How children learn and develop in context. *Applied Developmental Science, 23*(4), 307–337. https://doi.org/10.1080/10888691.2017.1398649

Castles, A., Rastle, K., & Nation, K. (2018). Ending the reading wars: reading acquisition from novice to expert. *Psychological Science in the Public Interest, 19*(1), 5–51. https://doi.org/10.1177/1529100618772271

Catts, H. W., Hogan, T. P., & Adlof, S. M. (2005). Developmental changes in reading and reading disabilities. In H. W. Catts & A. G. Kamhi (Eds.), *The connections between language and reading disabilities* (pp. 25–40). Lawrence Erlbaum Associates Publishers.

Cervetti, G. N., Wright, T. S., & Hwang, H. (2015). The impact of thematic coherence in reading on the quality of student discussions. Paper presented at the annual meeting of the Literacy Research Association, Carlsbad, CA.

Clay, M. (1985). Engaging with the school system: A study of interaction in new entrant classrooms. *New Zealand Journal of Educational Studies, 221*(1), 20–38.

Clay, M. (2005). *An observation survey of early literacy achievement* (2nd ed.). Heinemann.

Cragg, L. and Nation, K. (2010), Language and the development of cognitive control. *Topics in Cognitive Science, 2*, 631–642. https://doi.org/10.1111/j.1756-8765.2009.01080

Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology, 33*(6), 934–945. https://doi.org/10.1037/0012-1649.33.6.934

Cutting, L. E., Bailey, S.K., Barquero, L.A., & Aboud, K. (2015). Neurobiological bases of word recognition and reading comprehension. In C.M. Connor & P.M McCardle (Eds.), *Advances in reading intervention: Research to practice to research* (pp. 73–84). Paul H. Brookes.

Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning, 3,* 231–264. https://doi.org/10.1007/s11409-008-9029-x

Dore, R. A., Amendum, S. J., Golinkoff, R. M., & Hirsh-Pasek, K. (2018). Theory of mind: A hidden factor in reading comprehension? *Educational Psychology Review, 30*(3), 1067–1089. https://doi.org/10.1007/s10648-018-9443-9

Duke, N. K., & Cartwright, K.B. (2021). The science of reading progresses: Communicating advances beyond the simple view of reading. *Read Research Quarterly, 56*(S1), S25–S44. https://doi.org/10.1002/rrq.411

Duke, N. K., Pearson, D., Strachan, S. L., & Billman, A.K. (2011). Essential elements of fostering and teaching reading comprehension. In A. E. Farstrup & S. J. Samuels (Eds.), *What Research Has to Say About Reading Instruction,* (4th ed.) (pp. 51–93). International Reading Association, Inc.

Ehri, L. C. (1992). Reconceptualizing the development of sight word reading and its relationship to recoding. In P. Gough, L. Ehri & R. Treiman (Eds.), *Reading acquisition* (pp. 107–143). Lawrence Erlbaum.

Ehri, L. C. (2005). Learning to read words: theory, findings, and issues. *Scientific Studies of Reading, 9*(2), 167–188. https://doi.org/10.1207/s1532799xssr0902_4

Ehri, L., Nunes, S., Willows, D., Schuster, B., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly, 36*, 250–287. https://doi.org/10.1598/RRQ.36.3.2

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

Elleman, A. M. (2017). Examining the impact of inference instruction on the literal and inferential comprehension of skilled and less skilled readers: A meta-analytic review. *Journal of Educational Psychology, 109*(6), 761–781. https://doi.org/10.1037/edu0000180

Elleman, A. M., Lindo, E. J., Morphy, P., & Compton, D.L. (2009). The impact of vocabulary instruction on passage-level comprehension of school-age children: A meta-analysis. *Journal of Research on Educational Effectiveness, 2*(1), 1–44.

Elleman, A. M., & Oslund, E. L. (2019). Reading comprehension research: implications for practice and policy. *Policy Insights from the Behavioral and Brain Sciences, 6*(1), 3–11. https://doi.org/10.1177/2372732218816339

Elleman, A. M. (2017). Examining the impact of inference instruction on the literal and inferential comprehension of skilled and less skilled readers: A meta-analytic review. *Journal of Educational Psychology, 109*(6), 761–781. https://doi.org/10.1037/edu0000180

Fisher, D., & Frey, N. (2015). Improve reading with complex texts. *Phi Delta Kappan, 96*(5), 56–61. https://doi.org/10.1177/0031721715569472

Gambrell, L. B. (2011). Seven rules of engagement: What's most important to know about motivation to read. *Reading Teacher, 65,* 172–178. https://doi.org/10.1002/TRTR.01024

Gillon, G. T. (2018). *Phonological awareness: from research to practice.* Guilford Press.

Goodwin, A. P., & Ahn, S. (2013). A meta-analysis of morphological interventions in English: Effects on literacy outcomes for school-age children. *Scientific Studies of Reading, 17*(4), 257–285.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6–10. https://doi.org/10.1177/074193258600700104

Guajardo, N. R., & Cartwright, K. B. (2016). The contribution of theory of mind, counterfactual reasoning, and executive function to pre-readers' language comprehension and later reading awareness and comprehension in elementary school. *Journal of Experimental Child Psychology, 144*, 27–45. https://doi.org/10.1016/j.jecp.2015.11.004

Guthrie, J. T. (2002). Preparing students for high-stakes test taking in reading. In A. E. Farstrup & S. J. Samuels (Eds.), *What research has to say about reading instruction* (pp. 370–391). International Reading Association.

Guthrie, J. T., Wigfield, A., & You, W. (2012). Instructional contexts for engagement and achievement in reading. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 601–634). Springer Science + Business Media. https://doi.org/10.1007/978-1-4614-2018-7_29

Guthrie, J. T., Hoa, A. L. W., Wigfield, A., Tonks, S. M., Humenick, N. M., & Littles, E. (2007). Reading motivation and reading comprehension growth in the later elementary years. *Contemporary Educational Psychology, 32*(3), 282–313.

Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2017). *Foundational skills to support reading for understanding in kindergarten through 3rd grade* (NCEE 2016-4008). National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from http://whatworks.ed.gov

Hebert, M., Bohaty, J. J., Nelson, J. R., & Brown, J. (2016). The effects of text structure instruction on expository reading comprehension: A meta-analysis. *Journal of Educational Psychology, 108*, 609. https://doi.org/10.1037/edu0000082

Hoover, W. A., & Tunmer, W. E. (2018). The simple view of reading: three assessments of its adequacy. *Remedial and Special Education, 39*(5), 304–312.

Hudson, K. (1996). Onsets and rimes: An emphasis on onset-rime awareness as a critical necessity for teaching the dyslexic (or poor reader) to read and spell. *Australian Journal of Learning Disabilities, 1*(3), 18–21, https://doi.org/10.1080/19404159609546511

Hudson, R.F., Lane, H.B., & Pullen, P.C. (2005). Reading fluency assessment and instruction: What, why, and how? *The Reading Teacher, 58*(8), 702–714.

Hudson, R. F., Torgesen, J. K., Lane, H. B., & Turner, S. J. (2012). Relations among reading skills and sub-skills and text-level reading proficiency in developing readers. *Reading and Writing, 25*, 483–507. https://doi.org/10.1007/s11145-010-9283-6

Hulme, C., Bowyer-Crane, C., Carroll, J. M., Duff, F. J., & Snowling, M. J. (2012). The causal role of phoneme awareness and letter-sound knowledge in learning to read: Combining intervention studies with mediation analyses. *Psychological Science, 23*(6), 572–577. https://doi.org/10.1177/0956797611435921

Kieffer, M. J., Vukovic, R. K., & Berry, D. (2013). Roles of attention shifting and inhibitory control in fourth-grade reading comprehension. *Reading Research Quarterly, 48*(4), 333–348. https://ila.onlinelibrary.wiley.com/doi/10.1002/rrq.54

Landauer, T. K., & Dumais, S. T. (1997). A solution to Plato's problem: The latent semantic analysis theory of acquisition, induction, and representation of knowledge. *Psychological Review, 104*(2), 211.

Liew, J., Erbeli, F., Nyanamba, J., & Li, D. (2020). Pathways to reading competence: Emotional self-regulation, literacy contexts, and embodied learning processes. *Reading Psychology, 41*, 633–659. https://doi.org/10.1080/02702711.2020.1783145

Linan-Thompson, S., & Vaughn, S. V. (2004). *Research-Based Methods of Reading Instruction,* Grades K–3. ASCD.

Lovett, M. W., Lacerenza, L., & Borden, S. L. (2000). Putting struggling readers on the PHAST track: a program to integrate phonological and strategy-based remedial reading instruction and maximize outcomes. *Journal of Learning Disabilities, 33*(5), 458–476. https://doi.org/10.1177/002221940003300507

Marshall, J. C., & Campbell, Y.C. (2006). Practice makes permanent: Working toward fluency. In J. S. Schumm (Ed.), *Reading assessment and instruction for all learners: A comprehensive guide for classroom and resource setting* (pp. 190–121). Guilford Press.

Means, B., Toyama, Y., Murphy, R. F., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record, 115*(3), 1–47.

Mokhtari, K., & Niederhauser, D.S. (2013). Vocabulary and syntactic knowledge factors in 5th grade students' reading comprehension. *International Electronic Journal of Elementary Education, 5*(20), 157–170. Retrieved from https://www.iejee/com/index.php/IEJEE/article/view/18

National Early Literacy Panel (2008). *Developing early literacy: Report of the National Early Literacy Panel.* National Institute for Literacy. Retrieved from http://www.nifl.gov/earlychildhood/NELP/ NELPreport.html

National Research Council. (2000). *How people learn: Brain, mind, experience, and school* (expanded ed.). Committee on Developments in the Science of Learning and Committee on Learning Research and Educational Practice. J. D. Bransford, A. Brown, & R. R. Cocking (Eds.). Commission on Behavioral and Social Sciences and Education. National Academy Press.

Okkinga, M., van Steensel, R., van Gelderen, A. J. S. et al. (2018). Effectiveness of reading-strategy interventions in whole classrooms: A meta-analysis. *Educational Psychology Review, 30*, 1215–1239. https://doi.org/10.1007/s10648-018-9445-7

Paige, D. D., Smith, G. S., Rasinski, T. V., Rupley, W. H., Magpuri-Lavell, T., & Nichols, W. D. (2019). A path analytic model linking foundational skills to Grade 3 state reading achievement. *The Journal of Educational Research, 112*(1), 110–120.

Perfetti, C. (2010). Decoding, vocabulary, and comprehension. The golden triangle of reading skill. In M. G. McKeown, & L. Kucan (Eds.), *Bringing Reading Research to Life* (pp. 291–302). Guilford Press.

Pimentel, S., & Liben, M. (2021). Reading as liberation—an examination of the research base: How equity, acceleration, and personalization improve student learning. *Student Achievement Partners.* https://achievethecore.org/content/upload/EquityAccelerationPersonalizationFullReport.pdf

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences, 1*(4), 515–526. https://doi.org/10.1017/S0140525X00076512

Marchand-Martella, N. E., Martella, R. C., Modderman, S. L., Petersen, H. M., & Pan, S. (2013). Key areas of effective adolescent literacy programs. *Education & Treatment of Children, 36*(1), 161–184.

McRae, A., & Guthrie, J. T. (2009). *Promoting reasons for reading: Teacher practices that impact motivation.* In E. H. Hiebert (Ed.), Reading more, reading better (pp. 55–76). Guilford Press.

National Institute of Child Health and Human Development (NICHD). (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Pub No. 00–4754). National Institute of Child Health and Human Development.

Rayner, K., Foorman, B. R., Perfetti, C. A., Pesetsky, D., & Seidenberg, M. S. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest, 2*(2), 31–74. https://doi.org/10.1111/1529-1006.00004

Rasinski, T (2004). Creating fluent readers. *Educational Leadership.* 61(6), 46–51.

Recht, D. R., & Leslie, L. (1988). Effect of prior knowledge on good and poor readers' memory of text. *Journal of Educational Psychology, 80*(1), 16–20. https://doi.org/10.1037/0022-0663.80.1.16

Rose, J. (2006). *Independent review of the teaching of early reading: Final report.* Department for Education and Skills.

Rowe, K. (2005). Teaching reading: national inquiry into the teaching of literacy. Department of Education, Science and Training, Australian Council for Educational Research. Retrieved from https://research.acer.edu.au/tll_misc/5/.

Ryan, R. M., & Deci, E. L. (2002). Overview of self-determination theory: An organismic-dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3–33). University of Rochester Press.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness.* Guilford Press. https://doi.org/10.1521/978.14625/28806

Scarborough, H. (1998). Early identification of children at risk for reading disabilities: phonological awareness and some other promising predictors. In B. K. Shapiro, P. Accardo, & A. J. Capute (Eds.), *Specific reading disability: A view of the spectrum* (pp. 75–119). York Press.

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). Guilford Press.

Schuele, C. M., & Boudreau, D. (2008). Phonological awareness intervention: Beyond the basics. *Language, Speech, and Hearing Services in Schools, 39*(1), 3–20. https://doi.org/10.1044/0161-1461(2008/002)

Schunk, D. H., & Zimmerman, B. J. (2012). Self-regulation and learning. In I. Weiner, W. M. Reynolds, and G.E. Miller (Eds.) *Handbook of Psychology* (2nd ed.). https://doi.org/10.1002/9781118133880.hop207003

See, B. H., Gorard, S., & Siddiqui, N. (2017). Can explicit teaching of knowledge improve reading attainment? An evaluation of the Core Knowledge curriculum. *British Educational Research Journal, 43*(2), 372–393.

Sherwood, R. D., Kinzer, C. K., Hasselbring, T. S., & Branford, J. D. (1987). Macro-contexts for learning: Initial findings and issues. *Applied Cognitive Psychology, 1*, 93–108.

Smith, R., Snow, P., Serry, T., Hammond, L. (2021). The role of background knowledge in reading comprehension: a critical review. *Reading Psychology, 42*(3), 214–240.

Stahl, S., & Fairbanks, M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. *Review of Educational Research, 56*(1), 72–110.

Stevens, E. A., Walker, M. A., & Vaughn, S. (2017). The effects of reading fluency interventions on the reading fluency and reading comprehension performance of elementary students with learning disabilities: a synthesis of the research from 2001 to 2014. *Journal of Learning Disabilities, 50*(5), 576–590. https://doi.org/10.1017/S0142716413000222

Teale, W. H., & Sulzby, E. (1986). *Emergent literacy: Writing and reading.* Ablex.

Tighe, E. L., and Binder, K. S. (2015). An investigation of morphological awareness and processing in adults with low literacy. *Applied Psycholinguist, 36*, 245–273.

Torppa, M., Niemi, P., Vasalampi, K., Lerkkanen, M., Tolvanen, A., & Poikkeus, A. (2019). Leisure reading (but not any kind) and reading comprehension support each other—a longitudinal study across grades 1 and 9. *Child Development, 91*(3), 876–900.

Toste, J. R., Didion, L., Peng, P., Filderman, M. J., & McClelland, A. M. (2020). A meta-analytic review of the relations between motivation and reading achievement for K–12 students. *Review of Educational Research.*

Tunmer, W. E., & Chapman, J. W. (2012). The simple view of reading redux: vocabulary knowledge and the independent components hypothesis. *Journal of Learning Disabilities, 45*(5), 453–466. https://doi.org/10.1177/0022219411432685

Wagner, R. K., & Meros, D. (2010). Vocabulary and reading comprehension: direct, indirect, and reciprocal influences. *Focus on Exceptional Children, 2010*(1), 1–17.

Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., Burgess, S. R., Donahue, J., & Garon, T. (1997). Changing relations between phonological 46 processing abilities and word-level reading as children develop from beginning to skilled readers: A 5-year longitudinal study. *Developmental Psychology, 33*, 468–479.

Wright, T. S., & Cervetti, G. N. (2017). A Systematic Review of the Research on Vocabulary Instruction That Impacts Text Comprehension. *Reading Research Quarterly, 52*(2), 203–226. https://doi.org/10.1002/rrq.163

Yopp, H. K. (1992). Developing phonemic awareness in young children. *Reading Teacher, 45*(9) 696–703.

Zhang, D., & Ke, S (2020). The simple view of reading made complex by morphological decoding fluency in bilingual fourth-grade readers of English. *Reading Research Quarterly, 55*(2), 311–329. https://doi.org/10.1002/rrq.287

Zimmermann, L., Reed, D. K., & Gibbs, A. (2018). Text structure mapping: a strategy to improve reading comprehension of informational texts. *Iowa Reading Research Center.* https://iowareadingresearch.org/blog/text-structure-mapping.

772479576 21X8