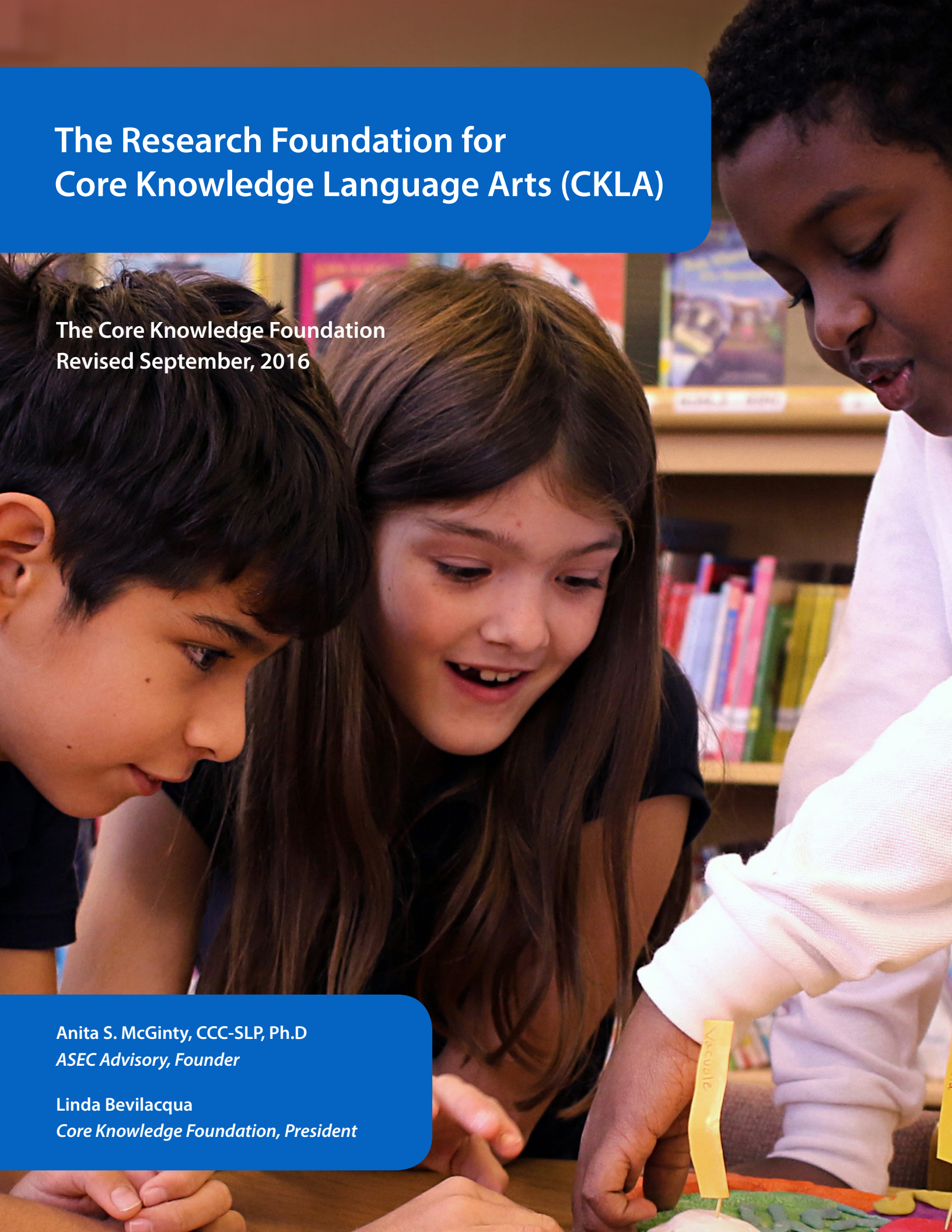
The Research Foundation for Core Knowledge Language Arts (CKLA)



The Core Knowledge Foundation
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Executive Summary

Core Knowledge Language Arts (CKLA) Program: Links to Research on Learning and Teaching

The Common Core State Standards (CCSS) establish an ambitious vision for the K–12 education system. The standards demand that educational experiences, at every point along the developmental continuum, transparently and intentionally point children toward becoming "college and career ready." Embedded within the language arts standards is a shift in how to approach reading and writing as developmental processes. The standards move away from reading and writing as discrete skills and toward reading and writing as language-based, lifelong developments that are tightly interwoven with children's growing knowledge. Indeed, language arts in the context of the CCSS puts knowledge first, with a call for curricula that is "intentionally and coherently structured to develop rich content knowledge within and across grades (NGA Center for Best Practices and CCSS, 2010, p. 10, as quoted in Cervetti & Hiebert, 2015). A major shift within the CCSS is the emphasis on "developing knowledge for and through reading" (Cervetti & Hiebert, 2015). This makes the *content* of texts as important as other more traditional factors considered within the ELA blocks of young children, such as text levels or decodability.

Although the CCSS establish a common focus on the integration of language arts instruction and knowledge building, common standards are not a guarantee that each effort at implementation will be equally effective. Important to the reform effort is the recognition that guidance on the goals of instruction (i.e., the standards) does not direct or demand consistency in the quality of curriculum, materials, or methods. The Core Knowledge Language Arts (CKLA) program meets the CCSS in ways that are consistent with the research on how children learn and on effective pedagogy. This paper establishes the links among the design of CKLA and research on children's learning and development, as well as research on effective teaching practices. To do this, the paper examines research-based rationales guiding the three major dimensions of the CKLA program: (1) the two-strand approach to instruction in K–3; (2) the language-based and knowledge-driven approach to building children's capacity with complex text; (3) and the importance of explicit and systematic instruction to build automaticity with the written code.

In this executive summary we provide the highlights, or general implications of the research reviewed within the paper, and the links between these research-based implications and the CKLA design. For a more detailed discussion of the research, please see the full paper.

A TWO-STRAND MODEL IS ESSENTIAL FOR DEVELOPING SKILLS AND COMPREHENSION IN K–3

The Research Highlights: A seminal reading theory—the Simple View of Reading (Hoover and Gough, 1990)—points to the importance of a reading curriculum that supports children's decoding development (i.e., ability to sound out and recognize words) and comprehension development (i.e., ability to understand what is written). Developmental research, however, demonstrates that there is a trade-off between how much a child focuses on decoding versus comprehension when reading, and this balance shifts as a child moves from learning to read to reading to learn (Kendeou, van den Broek, White, and Lynch, 2009; Vellutino, Tunmer, Jaccard, and Chen, 2007). The skilled reader (typically Grade 4 and above) has largely mastered decoding. As such, the skilled reader's primary task during reading is comprehension, which involves the ongoing, and often automatic, connecting of information and events within the text and between the text and background knowledge to form a coherent mental understanding (Gernsbacher, 1990; Graesser, Millis, and Graesser, 2011; Kintsch, 1994, 1998; Zwaan and Radvansky, 1998). For a child just learning to read, however, the task of reading largely emphasizes the process of decoding the words on the page (Vellutino et al., 2007). Indeed, cognitive research shows that young children make fewer connections than adults do (van den Broek, Kendeou, Kremer, Lynch, Butler, White, & Lorch, 2005). Notably, however, young children actually show the use of more adult-like, or sophisticated, comprehension skills during **listening** activities, and listening comprehension skills appear to set the pace for reading comprehension abilities through elementary school (Biemiller, 2003; van den Broek, et al., 2005).

CKLA's two-strand approach was designed in consideration of the theoretical premise of the Simple View of Reading, as well as the empirical research on reading development. The result is a program in which decoding and comprehension are given equal weight, and equal time, within the ELA block, and teachers are provided two complementary sets of materials designed for daily use and for intentional support of each aspect of reading development.

Overview of CKLA's Two-Strand Model

CKLA has two strands: the Listening and Learning strand and the Skills strand. The **Listening and Learning** strand emphasizes comprehension skill development in a language- and knowledge-rich context. The primary instructional activity is a read-aloud that exposes children to **complex texts** (beyond most children's reading levels), related to a systematically ordered set of topics, or domains. The materials are designed to build **knowledge** in areas of history, science, literature, and geography. The lesson activities emphasize **vocabulary** acquisition, build comprehension skills through interactive discussions during and after reading, and use writing to extend and explore the texts and their content. Although many ELA programs do involve the use of a teacher read-aloud and include activities for oral language development, classrooms continue to fall short with respect to the commitment of time and instructional support for oral language skills. For example, a recent study of twenty-seven third grade classrooms found that students received an average of two minutes a day of small group instruction in which teachers supported vocabulary and four minutes per day in support of comprehension-related instruction (Connor, et al., 2014, JEP). In contrast, the CKLA program involves forty-five to sixty minutes of instruction *daily* in which there is a read-aloud, discussions emphasizing text recall and higher order thinking about text, writing activities to extend understanding of the text, and explicit vocabulary instruction.

The **Skills** strand is a comprehensive, explicit, and systematic phonics program designed to build decoding, fluency, and writing/spelling skills. The Skills strand involves sixty minutes of daily instruction in which children are taught a specific set of letter-sound patterns within a unit of instruction (typically one to three weeks) and are given opportunities to practice and use these in word-, sentence-, and text-reading tasks, as well as within writing tasks. Unique to these materials are fully decodable books that still reflect grade-appropriate text complexity metrics (MetaMetrics Lexile Ratings, 2014). Children will read books ranging from fifty to one hundred pages (on average) that utilize only the sound-spelling patterns taught to date. Unlike many basal readers, which similarly seek to control or restrict the sound-spelling patterns presented in a book, the CKLA readers were developed to be authentic texts exploring interesting topics—such as travel, friendship, and cultural customs—as well as experiences to which young children can relate (e.g., pets, family routines, etc.). Thus children are engaged in decoding practice within an authentic book

that fosters comprehension skills. This was achieved through the use of a unique database of words created specifically for the design of these readers.

The subsequent two sections of the paper examine specific features of each of these strands of the CKLA program, the Listening and Learning strand and the Skills strand, as well as the empirical and theoretical grounds for the program's design. The executive summary presents the research in brief. For a more thorough discussion of the relevant research, see the full-length paper.

THE LISTENING AND LEARNING STRAND: A LANGUAGE-BASED, KNOWLEDGE-DRIVEN APPROACH INCREASES COMPREHENSION

The Research Highlights: There are two key lines of research relevant to the design of the Listening and Learning strand. The first relates the importance of language-based classroom experiences to children's reading development. Indeed, developmental perspectives emphasize the important relationship between early language skills and later reading abilities (Hogan, Adlof, and Alonzo, 2014; Lonigan and Shanahan, 2009; Vellutino, et al., 2007). However, the classroom, and its instructional materials, have not consistently mirrored this understanding (Pianta, Belsky, Houts, and Morrison, 2007). Studies looking at how instructional time is spent moment by moment find that classroom instruction under-emphasizes robust language and listening skills known to be linked to later reading ability (Connor, Spencer, Day, Guiliani, Ingebrand, McLean, and Morrison, 2014). This lack of support for oral language development in early childhood classrooms is not benign; it may be directly implicated in maintaining and even in entrenching inequalities in reading achievement (Wright & Neuman, 2014).

The second relevant line of research shows that vocabulary development, comprehension development, and knowledge development are interrelated. Cognitive perspectives on reading show that knowledge is necessary for comprehension. Indeed, knowledge—both general world knowledge and specific domain knowledge relevant to a text—is considered critical to memory for text, the ability to relate events and ideas across various parts of a text, the capacity to fill in knowledge authors assume is known, and the engagement in higher-order inference generation and thinking about a text (Kintsch, 1998; see also Cervetti and Hiebert, 2015, for an overview of this research). Empirical studies have found background knowledge relates to differences in comprehension and also in vocabulary learning (Kaefer, Neuman, and Pinkham,

2015) and suggest benefits to vocabulary learning within a content-, or knowledge-oriented, context (Neuman, Newman, and Dwyer, 2010; Pollard-Durodola, Gonzalez, Simmons, Davis, Simmons, and Nava-Walichowski, 2011; Spycher, 2009).

THE LISTENING AND LEARNING STRAND REFLECTS TWO SPECIFIC DESIGN PRINCIPLES THAT ARE GROUNDED IN THE BODIES OF RESEARCH JUST HIGHLIGHTED

Design Principle 1: *A read-aloud lesson format designed to support language skills is critical to later reading comprehension.*

CKLA's Listening and Learning strand prioritizes development of reading-related oral language skills through daily read-alouds. The structure of the read-aloud lessons reflects an emphasis on oral language development through vocabulary work, question asking and answering, open-ended discussions, and integration of oral and written language. Indeed, the read-aloud structure emphasizes talk before, during, and after the reading, which is consistent with most effective read-aloud programs. At the same time, the content of the read-aloud texts is used to build knowledge—a point that will be discussed further in subsequent sections of the paper.

Read-aloud lessons typically begin with "Introducing the Read-Aloud," a ten-minute section that starts with a discussion of the upcoming text and ends with the teacher helping students set a specific purpose for listening. "Presenting the Read-Aloud" is the ten- to fifteen-minute section in which the teacher actually reads the text. The read-aloud is conducted in an interactive manner (with comments and short questions interspersed throughout), and each chunk of text has accompanying visuals to support understanding and implicit vocabulary learning (displayed in a large flip book or on a smart board). Following the read-aloud are "Comprehension Questions" (ten to fifteen minutes), which include structured literal and inferential questions about the read-aloud. The order and type of these questions are designed to scaffold children's oral expression and participation (e.g., by balancing the nature and type of questions and priming children

to build up to more difficult questions), while also reinforcing content. The final discussion question typically provides an opportunity for a peer-sharing routine, such as "Think-Pair-Share" or "Question-Pair-Share." Lessons also include a short, explicit focus on language and/or vocabulary with structured Word Work activities (i.e., explicit instruction on one or two key words from the lesson) or syntax activities provided at the end of the lesson.

Design Principle 2: *A knowledge-oriented approach to text selection within a read-aloud program may enhance vocabulary acquisition and comprehension skill development, both of which are critical to later reading achievement.*

The organizing framework of the read-aloud component of CKLA's Listening and Learning strand consists of domains or topics of study. This creates a context in which knowledge, vocabulary, and comprehension skill development are built hand-in-hand. The domains of CKLA expose children to a broad array of topics related to literature (e.g., classic genres such as Greek myths or tall tales), science (e.g., astronomy, the human body, insects), and American and world history (e.g., ancient civilizations, the War of 1812). Within the academic year, domains are ordered intentionally, or systematically, to build on one another (see the *CKLA Program Guide* at https://s3.amazonaws.com/amplify-assets/pdf/ckla-program-guide.pdf for a grade-level list of domains). For example, ideas introduced by domains early in the kindergarten year (e.g., nursery rhymes, such as "Little Bo Peep" and "Baa, Baa Black Sheep," and content from the *Plants* and *Farms* domains) show up later in the year (e.g., when the *Colonial Towns and Townspeople* domain covers how tradespeople saved farming families time and effort and how cloth was made from cotton, flax, or wool), thus allowing children to return to previously learned knowledge in a new way. The CKLA instructional apparatus explicitly points teachers toward these sorts of connections and primes them to bring up previously taught information as it becomes relevant within new domains.

Domains are also organized across years (e.g., K through 5) to reflect a coherent, spiraling approach to knowledge building. For example, topics are sometimes expanded (e.g., the Kindergarten *Plants* domain is expanded on in the Grade 2 *Cycles in Nature* domain); refined (e.g., content introduced in the Kindergarten *Colonial Towns and Townspeople* domain is refined in the Grade 1 *A New Nation* domain, the Grade 3 *Colonial*

America domain, and the Grade 4 *American Revolution* domain); or grow in complexity (e.g., the complexity of the relationships between plants and animals intentionally grows from the Kindergarten *Plants* domain, to the Grade 1 *Animals and Habitats* domain, to the Grade 3 *Ecology* domain).

The content-focused organization of the read-alouds reflects a situation in which all children have a shared and relevant base of knowledge that they can use to support their comprehension of new and increasingly complex text. The domain approach mirrors what we understand of reading, from a cognitive perspective, because it prioritizes the use of comprehension skills in contextually meaningful situations. Similarly the domain structure serves to scaffold children's vocabulary in important ways. For each domain, children are exposed to vocabulary that reflects *networks* of words—or words related to a single topic—as categories and exemplars of ideas relevant to the topic. Having children hear structured vocabulary is an important way to facilitate children's vocabulary learning (Neuman, 2009). Of course, the repetition of core vocabulary in these focused domains also means that core concepts and facts are repeated. So children are acquiring vocabulary and knowledge, giving them a rich understanding of the domain.

Conclusion to Listening and Learning Strand Design Principles

CKLA Listening and Learning read-alouds are an important tool used across grades to build children's independent capacity for reading and analyzing complex text. The read-aloud experience is specifically designed to integrate key messages about successful reading from cognitive, developmental, and applied research bases. The interactive lesson format prioritizes the language basis of strong reading, while the knowledge-driven domain organization supports vocabulary acquisition, knowledge building, and comprehension development. In the next section of the paper, the focus turns to the second key idea around which the CKLA program is built: the importance of systematic and explicit instruction in supporting children's acquisition and fluency with the written code of English.

THE SKILLS STRAND: EXPLICIT AND SYSTEMATIC INSTRUCTION IS CRITICAL TO BUILDING EFFICIENT WORD-LEVEL SKILLS

Summary of Research Reviewed in This Section: There are three key lines of research relevant to the design of the Skills strand. The first is research showing the value of explicit and systematic teaching of phonics to early reading. Research consistently demonstrates that explicit phonics instruction has important, lasting benefits to children's reading accuracy, and this is one of the most emphasized aspects of phonics instruction for English language learners, as well as for children struggling to learn reading (August, Carlo, Dressler, and Snow, 2005; Brady, 2011; DeGraaff, Bosman, Hasselman, and Verhoeven, 2009; Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, and Shanahan, 2001; Torgesen, 2006; Torgesen, Alexander, Wagner, Rashotte, Voeller, and Conway, et al., 2001; Vaughn, 2007). An assumption of explicit phonics instruction is that there is value in maximizing children's knowledge about letter-sound correspondences as they begin to read and that such knowledge leads to efficiency and accuracy in reading. This assumption is well-grounded in empirical research (e.g., Share, 1995; Torgesen, et al., 2001; Vellutino, Scanlon, Sipay, Small, Pratt, Chen, and Denckla 1996; Ziegler and Goswami, 2005) and in developmental theories of how children learn to read (Ehri, 2005). Indeed, reading developmental theory suggests that "readers learn . . . by forming connections between letters in spellings and sounds in pronunciations of the words . . . The connections are formed out of readers' knowledge of the alphabetic system. This includes knowledge of grapheme–phoneme relations and phonemic awareness, that is, knowing how to distinguish the separate phonemes in pronunciations of words." (p. 170, Ehri, 2005). As children begin to consolidate this grapheme-phoneme information into word patterns, these larger units of words play a role in word reading. However, the basis for this learning is the alphabetic code. Collectively the research base suggests that explicit and systematic phonics instruction is most effective and that, among explicit phonics programs, those which foster children's knowledge of connections between letters and individual sounds in words are most consistent with developmental theory.

The second relevant line of research points to the importance of practice in building automaticity. In reading-skill acquisition, the end goal of practice is to achieve fluent, automatic reading, which is defined as "efficient, effective word-recognition skills that permit a reader to construct the meaning of text" (Pikulski and Chard, 2005, p. 510). To build such automaticity, practice is a necessary component (Willingham, 2009). For example, research finds that children's literacy and language learning can be influenced by the actual

number of exposures a child is given over the course of a long instructional period to specific targets, suggesting that practice which is focused on intentionally building exposure to specific sound-spelling patterns may be critical for supporting all learners (McGinty, Breit-Smith, Fan, Justice, and Kaderavek, 2011; Proctor-Williams, 2009; DeGraaff, et al., 2009). Yet, research also finds that simple drilling is not an effective approach to supporting children's long-term acquisition of information (Cepeda, Pashler, Vul, Wixted, and Rohre, 2006). The research on learning and memory tends to point to three key components of effective practice that are important for reading programs to consider: 1) motivation and attention, 2) understanding basic skills, and 3) extended practice. The primary link among these ideas is that each is seen as a strategy that can facilitate memory for information (Baker and Wigfield, 1999; Bandura, 1997; Cepeda, et al., 2006; Willingham, 2009).

The third relevant line of research comprises studies pointing to the critical importance of progress monitoring and instructional planning for instructional differentiation. Research shows that young children show significant variability in their acquisition of reading skills. Early recognition of differences in learning rates and trajectories, combined with adjustments to instruction that allow for different rates and types of learning, provide a powerful combination for preventing reading difficulties. Such intervention is essential before difficulties become pronounced and eventually intractable (e.g., Fletcher and Vaughn, 2009; Fuchs, Fuchs, and Compton, 2012; Vellutino, et al., 1996).

THE SKILLS STRAND REFLECTS THREE KEY DESIGN PRINCIPLES THAT ARE GROUNDED IN THE RESEARCH REVIEWED

Design Principle 1: *Blending a synthetic phonics approach with support for word patterns and high-frequency word learning reflects a powerful model of explicit and systematic phonics instruction.*

The CKLA program (particularly within Grades K–3) is a systematic phonics approach that teaches children phoneme-letter patterns and word patterns and seeks to build sight words. (*Sight words, as used in this paper, include words with known spelling patterns and high frequency words, as both tend to be read quickly and*

automatically (Ehri, 2005)). In CKLA, children are first taught to relate a single spelling to each of the forty-four sounds of English. CKLA seeks to minimize the challenges of this approach (i.e., that children will encounter exceptions to what they know) by teaching children the *most common and least ambiguous spelling for each sound* of English (e.g., a_e is taught for a long "a" sound because there are few exceptions). Thus, in Kindergarten, children learn to read the most frequent spellings for the sounds of English and learn sound-letter patterns that are likely to follow the rules (as the spellings taught first are also the least ambiguous). As with classic synthetic-phonics programs, CKLA also places an emphasis on phonemic-awareness skills in Kindergarten (i.e., blending/segmenting), which research has shown to be critical to supporting many young readers, particularly in early reading instruction (Torgesen, et al., 2001; Blachman, 1997). The instructional approach taken in Grades 1–3 is blended: children are still given information in single sound-letter patterns, but this information is introduced in ways that also build their understanding of larger-grained units of words (e.g., syllables, rimes). This approach is not only consistent with empirical studies showing the value of children having a strong grounding in letter-sound relations for *individual sounds in words,* but also reflects developmental theory that shows children begin to use larger word units for reading as they gain experience and skill (e.g., see Ehri, 2005).

Design Principle 2: *Combining word-level instruction with engaging text (and writing activities) that reinforce letter-sound targets creates a mastery oriented and motivating approach to building strong readers.*

Collectively, research points to practice experiences that are successful (thus motivating), that allow for the building of automaticity within basic skills (thus intense and consistent), and that build capacity to extend skills into varied contexts. The CKLA phonics program was uniquely designed with the cognitive science of practice in mind: it explicitly weaves in all three dimensions of systematic practice across lessons, units, and grades. In K–3, the program teaches children 150 spellings for the 44 sounds of English. It introduces an average of 5–10 letter-sound relationships within each unit of instruction; each unit lasts approximately 2–3 weeks. The program provides daily lessons during those 2–3 weeks in the 5–10 letter-sound relationships of focus, thus organizing lessons to maximize practice. Further, each day, children are given the chance for extended practice in those same letter-sound relationships through independent and/or small group

reading or writing activities. These opportunities for extended practice reflect naturalistic activities through which children are building other skills, such as grammatical skills related to sentence activities, genre writing, or reading and reading comprehension.

One of the unique aspects of extended practice afforded by CKLA is through the use of original, completely decodable student readers. In K–3, children read chapter books that are 100 percent decodable because they correspond to the unit of phonetic instruction in which they are placed. CKLA's developers designed their own books because they wanted to create texts that offered children extended reading practice that was both mastery oriented *and* engaging. In traditional leveled readers, the emphasis is on engaging and authentic texts, but these texts tend to only be loosely related to the phonetic code children know (e.g., leveled along varied parameters of language and vocabulary but not by phonetic patterns; see Nelson, et al., 2012; Shanahan, 1983). Basal readers—in which the code is tightly controlled within a text—have typically failed to represent authentic literature, having only simplified story structure, vocabulary, and repetitive sentences. CKLA seeks to balance the strengths of both these types of readers. To achieve this, the books are phonetically controlled, meaning that the words used contain only the sound-spelling patterns and sight words taught to date. However, CKLA's developers created a database that provided every single English word that adhered to the sound-spelling patterns taught to date in each unit of instruction. This provided a wealth of words that the authors could draw upon, which helped them craft chapter books on interesting topics, such as travel, friendship, and geography (e.g., in Grade 1, there is a book about a young girl who travels to Mexico and visits the Aztec ruins and another about a family on a sightseeing trip in London), while also building in practice with target sound-spelling patterns. For example, a reader from early in Grade 1 targets the "ee" spelling of the long /e/ sound (among other letter-sound patterns). The reader is one hundred pages and focuses on the interactions among a grandmother and her two grandchildren as she relays stories from her past, including trips to Hong Kong, the Barrier Reef, and a ranch out West. The book has seventeen short stories/chapters and across this content offers children seventy-one opportunities to practice the "ee" spelling pattern across thirty-three unique words (e.g., *keep, three, green, deep, cheer*). It is also important to note that the texts are appropriately complex (i.e., Lexiles on the books reflect grade-appropriate levels; see the *CKLA Program Guide* at https://s3.amazonaws.com/amplify-assets/pdf/ckla-program-guide.pdf and thus do not reflect the typical controlled basal reader in which language is often simplified and repetitive across the book.

Design Principle 3: *An aligned system of progress monitoring and instructional planning is critical to effective instructional differentiation.*

The CKLA approach to teaching phonics and reading/writing fundamentals is that of an integrated system of assessment, general curriculum, and supplementary curricular materials to be used for differentiation. Children are given assessments of their code knowledge each year as an initial placement process. From that, children are placed into a unit of instruction and, if this unit is below grade level, are given recommended added or supplementary differentiated instruction through the use of the *Assessment and Remediation Guide* (A&R Guide). The A&R Guide tracks to each specific unit of instruction and provides ideas for added or differentiated instructional activities around all key skills areas within kindergarten and first grade. In second grade, the remediation materials emphasize activities to focus on automaticity with the code and fluency in later grades. Further, the A&R Guide provides specific progress-monitoring tools to allow teachers to consider children's broader progress and response to the curriculum (with, again, suggestions and guidance on differentiation, depending on the results of these tools). Teachers can use these monitoring tools as needed. However, all children are given the curricular-based measures embedded into the general curricular materials. These unit-level assessments, designed as quick checks to ascertain how well children are learning within each unit of instruction, are accompanied by guidance about how to review and/or weave in individualized support from the A&R Guide when children fall below expected levels within these measures.

Summary and Closing

The key premise of the CKLA program is that it reflects three primary ideas: (1) the two-strand approach to ELA instruction in K–3, which is grounded in the Simple View of Reading theory; (2) the language-based and knowledge-driven approach to building children's capacity with complex text; and (3) the importance of explicit and systematic instruction to build automaticity with the written code. The two-strand approach to language arts within CKLA is grounded in the empirically supported theory that reading comprises skills in decoding and in listening comprehension. The result is a program in which decoding and comprehension

are given equal weight, and equal time, within the ELA block, and teachers are provided two complementary sets of materials designed for daily use and for intentional support of each aspect of reading development.

The first set of materials, the Listening and Learning strand, is a daily read-aloud program that approaches comprehension skill development, vocabulary acquisition, and knowledge-building as interrelated developmental processes that grow hand-in-hand. Lessons within the Listening and Learning strand involve forty-five to sixty minutes, *daily,* of oral language-based instruction, including a read-aloud, discussions emphasizing text recall and higher order thinking about text, writing activities to extend understanding of the text, and explicit vocabulary instruction. Unique to the program is the fact that these language and comprehension activities are conducted within a content-oriented context.

The second set of materials, the Skills strand, is a comprehensive, explicit, and systematic phonics program designed to build decoding, fluency, and writing/spelling skills. The Skills strand involves sixty minutes of daily instruction, in which children are taught a specific set of letter-sound patterns within a unit of instruction (typically one to three weeks) and are given opportunities to practice and use these in word-, sentence-, and text-reading tasks as well as within writing tasks. One of the unique aspects of extended practice afforded by CKLA is through the use of original, completely decodable student readers. CKLA's developers designed their own books because they wanted to create texts that offer children extended reading practice that is both mastery oriented *and* engaging. Although readers only present sound-spelling patterns that children have been taught, CKLA's unique database was used to provide authors a complete look at all the words available in English that children would know how to decode at any point within the curricular pathway. The result is a set of chapter books that correspond to each unit of instruction and are on interesting topics such as travel, friendship, and geography (e.g., in Grade 1, there is a book about a young girl who travels to Mexico and visits the Aztec ruins and another about a family on a sightseeing trip in London). Lastly, the Skills strand involves a system of progress monitoring and aligned differentiation activities to provide a comprehensive set of tools for effective instructional planning.

In closing, this paper has intended to highlight critical features of the CKLA program and to demonstrate the research foundations for the design principles that guided its development. This paper is not an exhaustive review of the literature related to reading and reading instruction, nor does it fully present the extensive

instructional materials available through the CKLA program. However, the information included in this paper shows that CKLA goes far beyond simple CCSS alignment. Rather, the CKLA program reflects what is known from research—though often poorly represented in classrooms—about children's learning and development related to both oral and written language. As such, the program reflects an aligned system that addresses the standards and, more importantly, equates what science says to what is done in the classroom.

Full Report

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Although the CCSS establish a common vision for the integration of language arts instruction and knowledge building, common standards are not a guarantee that each effort at implementation will be equally effective. Important to the reform effort is the recognition that guidance on the goals of instruction (i.e., the standards) does not direct or demand consistency in the quality of curriculum, materials, or methods. The Core Knowledge Language Arts (CKLA) program meets the CCSS in ways that are consistent with the research on how children learn and on effective pedagogy. This paper establishes the links among the design of CKLA and research on children's learning and development, as well as research on effective teaching practices. To do this, the paper examines research-based rationales guiding the three major dimensions of the CKLA program: (1) the two-strand approach to instruction in K–3; (2) the language-based and knowledge-driven approach to building children's capacity with complex text and vocabulary; and (3) the importance of explicit and systematic instruction to build automaticity with the written code.

A TWO-STRAND MODEL IS ESSENTIAL FOR DEVELOPING READING SKILLS AND COMPREHENSION IN K–3

The Research Highlights: A seminal reading theory—the Simple View of Reading (Hoover and Gough, 1990)—points to the importance of a reading curriculum that supports children's decoding development (i.e., ability to sound out and recognize words) and comprehension development (i.e., ability to understand what is written). Developmental research, however, demonstrates that there is a trade-off between how much a child focuses on decoding versus comprehension when reading, and this balance shifts as a child moves from learning to read to reading to learn (Kendeou, van den Broek, White, and Lynch, 2009; Vellutino, Tunmer, Jaccard, and Chen, 2007). The skilled reader (typically Grade 4 and above) has largely mastered decoding. As such, the skilled reader's primary task during reading is comprehension, which involves the ongoing, and often automatic, connecting of information and events within the text and between the text and background knowledge to form a coherent mental understanding (Gernsbacher, 1990; Graesser, Millis, and Graesser, 2011; Kintsch, 1994, 1998; Zwaan and Radvansky, 1998). For a child just learning to read, however, the task of reading largely emphasizes the process of decoding the words on the page (Vellutino et al., 2007). Indeed, cognitive research shows that young children make fewer connections than adults do (van den Broek, Kendeou, Kremer, Lynch, Butler, White, and Lorch, 2005). Notably, however, young children actually show the use of more adult-like, or sophisticated, comprehension skills during listening activities, and listening comprehension skills appear to set the pace for reading comprehension abilities through elementary school (Biemiller, 2003; van den Broek, et al., 2005).

CKLA's two-strand approach was designed in consideration of the theoretical premise of the Simple View of Reading, as well as the empirical research on reading development. The result is a program in which decoding and comprehension are given equal weight, and equal time, within the ELA block, and teachers are provided two complementary sets of materials designed for daily use and for intentional support of each aspect of reading development.

The Research Base for a Two-Strand Model

The Simple View of Reading posits that reading—whether for young children, older children, or adults—requires the combination of decoding (translating the written code to oral language) and listening comprehension (using prior knowledge, language skills, and reasoning skills to form connections and make meaning) (Hoover and Gough, 1990). Developmental research, however, demonstrates that there is a trade-off between how much a child focuses on decoding versus comprehension when reading, and this balance shifts as a child moves from learning to read to reading to learn (Kendeou et al., 2009; Vellutino et al., 2007). The skilled reader (typically Grade 4 and above) has largely mastered decoding. Thus the primary mental activity for the skilled reader is to create a mental understanding of the text. Research shows that this occurs broadly and constantly, with skilled readers making between two hundred and three hundred connections within each page of text (van den Broek, et al., 2005; van den Broek, Rapp, and Kendeou, 2005). Notably, much of this mental activity is not conscious, as the brain automatically works to form connections across words, sentences, and episodes (or groups of events) within the text, as well as between the text and background knowledge. The implication of this research is that skilled readers form a wide range of connections, on an ongoing basis, and do so efficiently, or largely automatically (Gernsbacher, 1990; Graesser et al., 2011; Kintsch, 1994; Zwaan and Radvansky, 1998).

For a child just learning to read, the amount of connections made during reading and the efficiency with which connections are made are more limited. In other words, it takes more mental energy to form a coherent understanding of a text. In part this reflects a developmental trajectory for comprehension skills development (van den Broek, et al., 2005). However, research also suggests that very young children are *capable* of forming a wide range of connections in response to a text read-aloud or to a story shown via media, but are less *efficient* at using these skills when reading themselves (van den Broek, et al., 2005). An important factor that may partially explain *why* comprehension is challenging for young children during reading is that they have fewer mental resources available for comprehension when decoding is not yet automatic (Vellutino, et al., 2007). Vellutino and colleagues modeled contributions to reading comprehension in younger and older children (i.e., in unskilled and skilled readers) and found that "comprehension processes do not become fully operative *in reading* (italics added) until the child is able to identify the printed word versions of the vast majority of words he or she is able to comprehend

in spoken language (p. 21, Vellutino, et al., 2007). This does not mean, however, that comprehension processes are not *developing* in young children. Indeed, recent reading research shows that decoding and language comprehension skills develop concurrently, though largely independently, in the early years (Catts, Compton, and Bridges, 2012; Kendeou, et al., 2009; Scarborough, 2009; Storch and Whitehurst, 2002). However, comprehension skills during reading appear to be less sophisticated than comprehension skills during listening activities and, in fact, listening comprehension appears to set the pace for reading comprehension through elementary school (Biemiller, 2003; Kendou, Bohn-Gettler, White, and van den Broek, 2008).

Collectively the messages from research suggest that a strong foundation for reading in the early years is designed to intentionally build listening comprehension and decoding abilities through texts and instructional activities that are designed for each of these distinct purposes.

LINKS TO CKLA

CKLA has two strands: the Listening and Learning strand and the Skills strand. The **Listening and Learning** strand emphasizes comprehension skill development in a language- and knowledge-rich context. The primary instructional activity is a read-aloud that exposes children to **complex texts** (beyond most children's reading levels) related to a systematically ordered set of topics, or domains. The materials are designed to build **knowledge** in areas of history, science, literature, and geography. The lesson activities also emphasize **vocabulary** acquisition, build comprehension skills through interactive discussions during and after reading, and use writing to extend and explore the texts and their content. Although many ELA programs do involve the use of a teacher read-aloud and include activities for oral language development, classrooms continue to fall short with respect to the commitment of time and instructional support for oral language skills. For example, a recent study of twenty-seven third grade classrooms found that students received an average of two minutes a day of small group instruction in which teachers supported vocabulary and four minutes per day in support of comprehension-related instruction (Connor, Spencer, Day, Guiliani, Ingebrand, McLean, and Morrison, 2014). In contrast, , the CKLA program involves forty-five to sixty minutes of instruction *daily* in which there is a read-aloud, discussions emphasizing text recall and higher order thinking about text, writing activities to extend understanding of the text, and explicit vocabulary instruction.

The **Skills** strand is a comprehensive, explicit, and systematic phonics program designed to build decoding, fluency, and writing/spelling skills. The Skills strand involves sixty minutes of daily instruction in which children are taught a specific set of letter-sound patterns within a unit of instruction (typically one to three weeks) and are given opportunities to practice and use these patterns in word, sentence, and text reading tasks as well as within writing tasks. Unique to these materials are fully decodable books that still reflect grade-appropriate text complexity metrics (MetaMetrics Lexile Ratings, 2014). Children will read books ranging from fifty to one hundred pages (on average) that utilize only the sound-spelling patterns taught to date. Unlike many basal readers, which similarly seek to control or restrict the sound-spelling patterns presented in a book, the CKLA readers were developed to be authentic texts exploring interesting topics—such as travel, friendship, and cultural customs—as well as experiences to which young children can relate (e.g., pets, family routines, etc.). Thus children are engaged in decoding practice within an authentic book that fosters comprehension skills. This was achieved through the use of a unique database of words created specifically for the design of these readers.

The subsequent two sections of this paper examine specific features of each of these strands of the CKLA program, the Listening and Learning strand and the Skills strand, as well as the empirical and theoretical grounds for the program's design. It is important to note that the two-strand model adapts, starting in third grade, to reflect the developmental intertwining of decoding and listening comprehension that is expected as children transition from learning to read to "reading to learn." In third grade, the program continues to reflect a Skills strand and a Listening and Learning strand, but the content in the two strands overlaps more consistently. In Grades 4 and 5, instruction moves away from the two-strand model toward a singular language arts block. It is important to note that the integration of the two strands in Grades 4 and 5 also reflects developmental perspectives on reading. By Grades 4 and 5, the focus is on fluent reading for meaning-making, and the emphasis, instructionally, needs to be on increasing efficiency and skill in the integration of word- and text-level skills, as occurs with proficient readers (Perfetti, 2007; Perfetti and Adlof, 2012). Although Grades 4 and 5 do not have two distinct strands of materials—as occurs in the Listening and Learning strand and Skills strand for grades K–3—there are still many shared principles of curricular design (i.e., design principles) across all the years. The two big ideas that are consistent across all grades are: 1) the importance of taking a language-based and knowledge-driven approach to building children's capacity for complex text; and 2) the importance of an explicit and systematic approach to teaching the code of English.

The remainder of this paper will examine the research that underlies these instructional decisions and how CKLA reflects the research base; however, it will focus on doing so within the context of the two-strand design.

THE LISTENING AND LEARNING STRAND: A LANGUAGE-BASED, KNOWLEDGE-DRIVEN APPROACH TO BUILD COMPREHENSION

The Research Highlights: There are two key lines of research relevant to the design of the Listening and Learning strand. The first relates the importance of language-based classroom experiences to children's reading development. Indeed, developmental perspectives emphasize the important relationship between early language skills and later reading abilities (Hogan, Adlof, and Alonzo, 2014; Lonigan and Shanahan, 2009; Vellutino, et al., 2007). However, the classroom and its instructional materials have not consistently mirrored this understanding (Pianta, Belsky, Houts, and Morrison, 2007). The second line of research shows that vocabulary development, comprehension development, and knowledge development are interrelated (Kintsch, 1994, 1998; see also Cervetti and Hiebert, 2015 for an overview of this research). The CKLA Listening and Learning strand reflects a direct response to these two lines of research. The design of CKLA read-alouds is defined by two key principles: (1) an interactive read-aloud lesson is an effective approach to building reading-related language skills critical to language success; and (2) a knowledge-oriented approach to read-alouds supports listening-comprehension skills development and vocabulary, both of which are important to later reading achievement.

Design Principle 1: *An interactive read-aloud lesson format is an effective approach to building reading-related language skills critical to reading success.*

According to the National Assessment of Educational Progress in reading, 31 percent of our nation's fourth-grade children cannot comprehend text at the basic level (National Center for Education Statistics, 2015). Although developmental perspectives emphasize the strong relationship between early language skills and later reading comprehension (Dickinson, Golinkoff, and Hirsch-Pasek, 2010; Hogan, et al., 2014; Hoff, 2013; Kendeou, et al., 2009; Lonigan and Shanahan, 2009; National Institute of Child Health and Human

Development Early Child Care Research Network [NICHD ECCRN], 2005; Storch and Whitehurst, 2002; Vellutino, et al., 2007), the classroom and its instructional materials and practices have not consistently mirrored this understanding (Pianta, et al., 2007). Studies looking at how instructional time is spent moment by moment find that classroom instruction under-emphasizes robust language and listening skills in early childhood classrooms (Connor, et al., 2014). This lack of support for oral language development in early childhood classrooms is not benign; it may be directly implicated in maintaining and even in entrenching inequalities in reading achievement (Wright and Neuman, 2014).

That initial differences in young children's language skills—particularly in vocabulary and listening comprehension—predict later differences in reading success is a premise that has been supported by decades of research (for reviews of this research see Lonigan and Shanahan, 2009). However, research is also beginning to converge to show that early differences in reading-related *language* skills—particularly vocabulary skill—tend to become increasingly disparate across the elementary years (for a review see Pfost, Hattie, Dörfler, and Artelt, 2014). In other words, children who start strong tend to get stronger, and children who start out vulnerable tend to fall behind (e.g., the "Matthew effect" or the idea that the rich get richer; Stanovich, 1986). These findings suggest that classrooms in the early grades may not provide sufficient support to ensure that all children are attaining the reading-related language skills needed for later reading achievement. In fact, the trend suggests that a lack of support for reading-related oral language skills in the elementary classroom may have an effect on reading achievement that is disproportionately borne by those children who are already most at risk (Wright and Neuman, 2014).

One practice that offers great potential for supporting young children's language and literacy development within the early childhood classroom is the read-aloud (Biemiller and Boote, 2006; Greene Brabham and Lynch-Brown, 2002; Zucker, Cabell, Justice, Pentimonti, and Kaderavek, 2013). However, not all read-alouds are equally supportive of children's language and literacy development (for a review see Mol, Bus, and De Jong, 2009). With respect to reading-related language skills, a key difference between effective read-alouds and less beneficial ones is the nature of **interactions** that occur in and around the book (Hindman, Wasic, and Erhart, 2012; van Kleeck, Vander Woude, and Hammett, 2006; Zucker, et al., 2013). A critical dimension of a high quality interactive read-aloud is the balance of both literal and inferential questioning before, during, and/or after the read-aloud to ensure the book launches text-focused discussions that review *and*

extend the concepts within the book (Hindman, et al., 2012; Santoro, Chard, Howard, and Baker, 2008; van Kleeck, et al., 2006; Zucker, Justice, Piasta, and Kaderavek, 2010). The point of these questions and of the talk during the shared reading experience is to scaffold children's experience with the text to ensure that all children are supported in making meaning of the book (Pentimonti and Justice, 2010). A second, well-recognized practice within shared interactive read-alouds is the focus on vocabulary during reading (Biemiller and Boote, 2006; Lonigan and Shanahan, 2009; Senechal, Outlette, and Rodney, 2006). By selecting specific words critical to comprehension of the text and important for children's general knowledge, teachers can most effectively use the shared reading experience to enhance children's vocabulary.

Although the practice of adults reading aloud to young children is a classic and common one, often the quality of the read-aloud falls short of what is needed to support literacy-related language development in all children (Justice et al., 2008; Wright and Neuman, 2014; see Mol, Bus, and De Jong, 2009). It is not entirely surprising that teachers and classrooms have difficulty implementing language-rich instructional practices during shared reading, as the nuances of these practices can be quite challenging. Research finds that instructional materials geared at eliciting high quality reading and language experiences in the classroom often lack extensive support for teachers around these same practices (Justice, Mashburn, Hamre, and Pianta, 2008; Dickinson and Porche, 2011). The most effective shared reading programs contain highly specified and structured lesson materials that help teachers integrate the use of general language support strategies into specific materials and activities (Dickinson, Freiberg, and Barnes, 2011). Thus, the applied literature suggests that the potential of the read-aloud for supporting young children's language and reading development is largely unrealized and points to the importance of curricular materials that are cognizant of the challenges in creating a highly effective read-aloud.

LINKS TO CKLA

CKLA's Listening and Learning strand prioritizes development of reading-related oral language skills through daily read-alouds. The structure of the read-aloud lessons reflects an emphasis on oral language development through vocabulary work, question asking and answering, open-ended discussions, and integration of oral and written language. Indeed, the read-aloud structure emphasizes talk before, during, and after the reading. The content of the read-aloud texts is used to simultaneously build knowledge and language—a point that will be discussed further in subsequent sections of this paper. Notably, and as

mentioned previously, the Listening and Learning materials provide teachers the structure for providing forty-five to sixty minutes of daily language, vocabulary, and comprehension support within the context of also building knowledge.

CKLA read-aloud lessons typically begin with "Introducing the Read-Aloud," a ten-minute section that starts with a discussion of the upcoming text and ends with the teacher helping students set a specific purpose for listening. "Presenting the Read-Aloud" is the ten- to fifteen- minute section in which the teacher actually reads the text. The read-aloud is conducted in an interactive manner (with comments and short questions interspersed throughout,) and each chunk of text has accompanying visuals to support understanding and implicit vocabulary learning (displayed in a large flip book or on a smart board). Following the read-aloud are "Comprehension Questions" (ten to fifteen minutes), which include structured literal and inferential questions about the read-aloud. The order and type of these questions are designed to scaffold children's oral expression and participation (e.g., by balancing the nature of questions and priming children to build up to more difficult questions), while also reinforcing content. The final discussion question typically provides an opportunity for a peer-sharing routine, such as "Think-Pair-Share" or "Question-Pair-Share." Lessons also include a short, explicit focus on language and/or vocabulary with structured Word Work activities (e.g., explicit instruction on one or two key words from the lesson) or syntax activities provided at the end of the lesson. This type of highly interactive and language-rich and vocabulary-supportive read-aloud is seen as particularly valuable to ELL students (Calderón, Minaya-Rowe, and Duran, 2005; Calderón,Slavin and Sanchez, 2011; Hickman, Pollard-Durodola, and Vaughn, 2004). The text talk that occurs around and within the read-aloud provides opportunity for repetition of key ideas and vocabulary, and can help make the text and content accessible to ELL students through the teacher-guided supports provided during the read-aloud, such as intonation, definition-providing, and extensions toward children's own knowledge and background. In CKLA these supports are intentionally placed for the teacher to help ensure that interactions known to support children's development actually occur. Lessons end with application activities that help children integrate oral and written language, as well as synthesize and organize the information they received from the read-aloud.

The highly scaffolded instructional apparatus of CKLA also reflects the growing body of research that points to the importance of such support to teachers for eliciting high-quality interactions during curricular activities. For example, within the teacher guide, the read-aloud text is annotated to suggest to teachers

when to pause reading and engage the class in quick vocabulary checks, clarifications, or brief questions about the read-aloud (these are called Guided Listening Supports). Teachers are provided specific suggestions related to individual comprehension questions, addressing how to support the success of various learners (e.g., suggestions for returning to relevant text passages to support students' answering of these questions) and techniques for elaborating children's answers. These suggestions, specific to the question and to the content of the read-aloud, provide teachers a perspective on how to integrate language and vocabulary teaching techniques to the specific lesson or question at hand. Although this guidance is not a required script, it does reflect the growing research base indicating that language and literacy instructional materials need to be much more specific and fine-grained to elicit the high-quality interactions known to support children's development.

This type of high-support curricular apparatus may be particularly important as teachers integrate nonfiction texts into their classrooms. Historically, teachers' use of nonfiction and informational texts has been very limited in early childhood classrooms (Duke, 2000; Pentimonti, Zucker, Justice, and Kaderavek, 2010). And yet, research finds that nonfiction texts may provide a particularly useful context for supporting inferential and analytic talk—the type of language talk seen as critical to vocabulary and language development (Zucker et al., 2010). The design of CKLA seeks to support teachers' transition to these nonfiction texts within the context of the CCSS, with the intent of ensuring the read-alouds function to build children's content, vocabulary, and language learning.

Design Principle 2: *A knowledge-oriented approach to read-alouds supports listening-comprehension skills development and vocabulary, both of which are important to later reading achievement.*

Traditionally, reading or language arts instruction has prioritized comprehension skills development over knowledge acquisition, perhaps with the assumption that comprehension skills are a necessary prerequisite to gaining knowledge from text. Similarly, vocabulary development has emphasized the value of sophisticated words and vocabulary acquisition *processes,* but has not consistently considered the role that knowledge may play in vocabulary acquisition. What research finds, however, is that knowledge, vocabulary,

and comprehension skills are interrelated and interdependent. Vocabulary and content knowledge are theoretically and/or empirically linked to reading comprehension (for language: Nation and Snowling, 2004; NICHD ECCRN, 2005; Oulette, 2006; Sénéchal, et al., 2006; for knowledge: Gaultney, 1995; Hagoort, Hald, Bastiaansen, and Petersson, 2004; Hirsch, 2003; Willingham, 2006). Similarly, knowledge is seen as facilitative of vocabulary acquisition. We consider each of these premises in more depth in the following sections.

How a Knowledge-Driven Approach Helps Comprehension

The use of knowledge is necessary for creating a coherent understanding of the text. Comprehension can be defined in many ways but typically involves memory for text, relating events and ideas across various parts of a text, filling in knowledge that authors assume is known, and forming higher-order inferences and/or resolving ambiguity in text (Gernsbacher, 1990; Graesser, Millis, and Graessser, 2011; Kintsch, 1998, 2004; van den Broek, et al., 2005; Zwaan and Radvansky, 1998; and Cervetti and Hiebert, 2015, for an overview of this research). The following example illustrates one important way that knowledge plays an active role in comprehension processes and shows how even the simplest texts demand the use of knowledge. Consider the text, "It was winter, but Jane forgot her coat." Even such a simple statement requires that a reader's knowledge of the world is used when working to understand this text. Without world knowledge that coats keep you warm and winter is cold, the sentence would not make sense. The role of knowledge in comprehension is compounded as readers must integrate the text with knowledge (world knowledge and domain or topic knowledge) to understand connections among ideas and events in a text, as well as links across various texts on a topic (e.g., themes).

Thus, from a cognitive perspective, "comprehension" reflects a mental web of connections and ideas that weave together a text and knowledge (Kintsch, 1998, 2004). As this is woven together—through automatic, mental activation of known words and ideas, as well as with active attempts to create inferences (such as cause-effect and character motivation)—the reader understands the text. Readers who lack prior knowledge of the topic in the text often do not have the mental store of words and ideas needed to form a clear or coherent mental understanding of the text. As a result, they often fail to fill in conceptual gaps within the text and fail to make inferences that go beyond information explicitly stated in the text (Davis and Gutherie, 2014; McKeown, Beck, Sinatra, and Loxterman, 1992; Pearson, Hansen, and Gordon, 1979;

Voss and Silfies, 1996). This is true even if receiving training in comprehension strategies (McNamara, 2004). Further, knowledge appears to influence children's memory for text and ability to answer higher-order questions about the text (Best, Floyd, and McNamara, 2008; Taft and Leslie, 1985). Thus building background knowledge in young readers—including relevant world knowledge and topic or domain knowledge—may be an important component of supporting success in using comprehension strategies during reading. In fact, empirical research suggests that teaching comprehension strategies in the context of conceptually focused reading instruction is more effective than teaching such strategies in a more traditional, non-topic oriented ELA context (Guthrie, Wigfield, Barbosa, Perencevich, Taboada, Davis, and Tonks, 2004; Gaultney, 1995; see also Cervetti).

Knowledge also appears to be a protective factor in the comprehension of text for those children who may be weaker in learning to decode. One of the most powerful pieces of evidence for this idea comes from studies showing how knowledge can actually compensate for low reading skill and low cognitive ability in readers (Adams, Bell, and Perfetti, 1995; Bjorklund and Schneider, 1996; Recht and Leslie, 1988; Schneider, Körkel, and Weinert, 1989). When children who are generally weak readers are presented with a text on a topic they know a lot about, their comprehension is better than that of generally strong readers who do not know about the topic. This research would suggest that the teaching of reading strategies would not be sufficient for paving a pathway to strong reading comprehension in the absence of building knowledge (see also Willingham, 2006).

LINKS TO CKLA

The organizing framework of the read-aloud component of CKLA's Listening and Learning strand is a focus on domains or topics of study. This creates a context in which knowledge, vocabulary, and comprehension skill development are built hand-in-hand. The domains of CKLA expose children to a broad array of topics related to literature (e.g., classic genres such as Greek myths or tall tales), science (e.g., astronomy, the human body, insects), and American and world history (e.g., ancient civilizations, the War of 1812). Within the academic year, domains are ordered intentionally, or systematically, to build on one another (see the *CKLA Program Guide* at https://s3.amazonaws.com/amplify-assets/pdf/ckla-program-guide.pdf for a grade-level list of domains). For example, ideas introduced by domains early in the Kindergarten year (e.g., nursery rhymes, such as "Little Bo Peep" and "Baa, Baa Black Sheep," and content from the *Plants* and

Farms domains) show up later in the year (e.g., when the *Colonial Towns and Townspeople* domain covers how tradespeople saved farming families time and effort and how cloth was made from cotton, flax, or wool), thus allowing children to return to previously learned knowledge in a new way. The CKLA instructional apparatus explicitly points teachers toward these sorts of connections and primes them to bring up previously taught information as it becomes relevant within new domains.

Domains are also organized across years (e.g., K through 5) to reflect a coherent, spiraling approach to knowledge building. For example, topics are sometimes expanded (e.g., the Kindergarten *Plants* domain is expanded on in the Grade 2 *Cycles in Nature* domain); refined (e.g., content introduced in the Kindergarten *Colonial Towns and Townspeople* domain is refined in the Grade 1 *A New Nation* domain, the Grade 3 *Colonial America* domain, and the Grade 4 *American Revolution* domain); or grow in complexity (e.g., the complexity of the relationships between plants and animals intentionally grows from the Kindergarten *Plants* domain, to the Grade 1 *Animals and Habitats* domain, to the Grade 3 *Ecology* domain).

The content-focused organization of the read-alouds reflects a situation where all children have a shared and relevant base of knowledge that they can use to support their comprehension of new and increasingly complex text. The domain approach mirrors what we understand of reading, from a cognitive perspective, because it prioritizes the use of comprehension skills in contextually meaningful situations. As discussed, research on text comprehension points to the fact that comprehension requires readers (or listeners) to use various strategies—implicitly and explicitly—to form inferences and links among aspects of the text. Background knowledge is a key ingredient in using these strategies successfully. Consistent with this, CKLA approaches comprehension strategies within read-aloud lessons as a means to an end, not as ends in themselves. The focus is on knowledge-building through the texts and on having children *use* their growing knowledge to facilitate their analytic interactions with texts on the same topic. Thus, children are encouraged to use comprehension strategies, as needed, at various points during the read-aloud. Their success in using these strategies is scaffolded by teachers' instructional support (e.g., some explicit teaching) but also supported by the fact that they are being given the background knowledge that is fundamental to their success in applying comprehension strategies.

How a Knowledge-Driven Approach Helps Vocabulary

The link between vocabulary and reading success is well-established (e.g., Nation and Snowling, 2004; NICHD ECCRN, 2005; Oulette, 2006; Sénéchal, et al., 2006; Storch and Whitehurst, 2002). A recent meta-analysis shows that explicit vocabulary teaching of words that will appear in a text enhances children's comprehension of that text (Elleman, Lindo, Morphy, and Compton, 2009). Notably, this effect was *particularly* strong for children with vulnerabilities in reading development. Vocabulary learning is also seen as related to a general increase in reading comprehension skills (Lubliner and Smetana, 2005; Nelson and Stage, 2007; Sampson, Valmont, and van Allen, 1982). Similarly, one of the most critical ways to support the success of ELL students is a robust and constant focus on vocabulary development (August, Carlo, Dressler, and Snow, 2005; D'angiulli, Siegl, and Maggi, 2004).

This research would suggest that focusing on vocabulary in the classroom is critical. Although this is true, it is also true that it is not possible to teach children the number of vocabulary words needed to ensure robust vocabulary learning. Children with average vocabulary development are learning approximately 3,000 words per year (Cunningham, 2005). Among the most conservative studies, showing the smallest vocabulary deficits, it is estimated that children who are in the lowest 25th percentile of vocabulary have a 6,000-word gap in fourth grade when compared to the average fourth grade child (as discussed in McKeown and Curtis, 2014). In studies showing the largest deficits, this gap appears to be much more daunting. For example, a study examining root vocabulary word growth (in which root words link to knowing many other related words) suggests that by the end of second grade, children in the lowest 25th percentile of vocabulary knowledge know 4,100 fewer root words than children in the highest quartile, and this leads to a gap of tens of thousands of words (Biemiller and Slonim, 2001). Thus more vulnerable children—such as those with language vulnerabilities or ELL students—are left with the task of learning approximately 4,000 to 5,000 words per year, at least, to even begin to catch up to their peers. Explicit teaching can be quite effective for deepening children's knowledge of a few, select words, but such methods can only teach a few hundred words, at the most, within a year of school (Beck, McKeown, and Kucan, 2013). Further, a meta-analysis of vocabulary interventions demonstrated a weaker effect of such explicit methods for more vulnerable children (Marulis and Neuman, 2010).

Thus, implicit means of teaching words, through exposure to those words in everyday contexts, is a necessary and large part of vocabulary learning. However, a simple and singular exposure to a word is also not enough. For example, research finds that children will only retain approximately 15 percent of words to which they are both exposed and taught during book reading, even when the book is repeated multiple times (Swanborn and de Glopper, 1999). This is confirmed by cognitive research that finds children's capacity for learning new words from a single exposure (i.e., ability to "fast-map" words) is much more limited than originally thought. Initial impressions of words that are heard are very likely to fade or disappear and do not reflect lasting learning processes for vocabulary (Gershkoff-Stowe and Hahn, 2007; Wilkinson, Ross, and Diamond, 2003).

Research suggests that implicit vocabulary learning is best supported with *intentional and repeated word exposure* (Biemiller and Boote, 2006). One way to do this is to organize vocabulary learning within units of content, in which there is natural reinforcement and repetition of vocabulary. Indeed, there is empirical and theoretical support for the value of organizing opportunities for word learning around topics of study (Neuman, Newman, and Dwyer, 2010; Pollard-Durodola, Gonzalez, Simmons, Davis, Simmons, and Nava-Walichowski, 2011; Spycher, 2009). Notably, this research suggests that a content-based approach to vocabulary instruction appears effective within populations that have historically shown weaker responses to vocabulary instruction—including children who are demographically at risk and English language learners (see Neuman and Celano, 2006). Conceptually, a content-organized and intentional approach to vocabulary exposes children to *networks* of words on a singular topic, meaning it exposes children to words that represent *categories* of information and *exemplars* of those categories. As such, the words children hear through these topics of study—across read-alouds and discussions (and potentially extensions and class activities)—have some degree of shared properties and include higher-level words (i.e., categories) and lower-level words (i.e., exemplars). This structure mirrors the structure of how words are organized and stored, mentally. For example, a child who hears about the category *weather* and hears multiple stories on types of weather will be primed to form inferences of how weather ideas relate (e.g., weather states representing a continuum of calm to stormy become connected to weather terms about storm types; Neuman and Dwyer, 2009). This type of domain-organized knowledge and word clustering represent important cognitive processes for deep and lasting word learning and knowledge building.

LINKS TO CKLA

CKLA's domain structure prioritizes knowledge acquisition within the language arts block and serves to scaffold children's vocabulary in ways consistent with the literature. It is important, when considering the value of the domain structure of CKLA to vocabulary learning, to understand that a distinction is made between these domains and the theme-based units used in many early childhood programs and curricula. Themes in this latter approach tend to be loosely connected topics, such as leaders or community helpers. In this approach, children are exposed to a breadth of exemplars of the theme, but these exemplars usually do not have a common vocabulary (or much in common). The looseness of themes makes it less likely that children will draw connections and inferences across many words they hear within a theme (e.g., vocabulary related to a librarian and fireman are largely distinct but both could be exemplars on a theme-based unit of community helpers). In contrast, CKLA domains are focused topics with a common vocabulary and tend to be areas of study or expertise for adults (thus are topics that can also be refined and expanded across the grades). As such, domains are organized specifically to support children's exposure to and acquisition of networks of words on a single topic, in which the words are likely to have many shared properties and work together hierarchically. Of course, the repetition of core vocabulary in these focused domains also means that core concepts and facts are repeated. So children are acquiring vocabulary and knowledge, giving them a rich understanding of the domain, while also building word knowledge.

Also important to children's vocabulary is the way that domains are ordered over time. Domains build on one another within a year; they also expand and are refined across years. Therefore, children gain multiple exposure to the common vocabulary and concepts shared among related domains (e.g., five senses; human body), as well as begin building wider, broader networks of more loosely related words and ideas. This approach builds breadth and depth in vocabulary, which research points to as an essential component of robust word-learning programs (Beck, McKeown, and Kucan, 2013). Further, this repetition of words and concepts in new contexts and after some time has passed, reflects an important way of reinforcing word learning.

Summary for the Listening and Learning Strand

CKLA read-alouds are an important tool used across grades to build children's independent capacity for reading and analyzing complex text. The read-aloud experience is specifically designed to integrate key messages about successful reading from cognitive, developmental, and applied research bases. The interactive lesson format prioritizes the language basis of strong reading, while the knowledge-driven domain organization supports vocabulary acquisition, knowledge building, and comprehension development. In the next section of this paper, the focus turns to the second key idea around which the CKLA program is built: the importance of systematic and explicit instruction in supporting children's acquisition and fluency with the written code of English.

THE SKILLS STRAND: EXPLICIT AND SYSTEMATIC INSTRUCTION IS CRITICAL TO BUILDING EFFICIENT WORD-LEVEL SKILLS

The Research Highlights: There are three key lines of research relevant to the design of the Skills strand. The first is research showing the value of explicit and systematic teaching of phonics to early reading. The second relevant line of research points to the importance of practice in building automaticity. In reading-skill acquisition, the end goal of practice is to achieve fluent, automatic reading, which is defined as "efficient, effective word-recognition skills that permit a reader to construct the meaning of text" (Pikulski and Chard, 2005, p. 510). To build such automaticity, practice is a necessary component (Willingham, 2009). The third relevant line of research comprises studies pointing to the importance of an aligned system of progress monitoring and instructional planning for instructional differentiation. The CKLA Skills strand is directly responsive to these three lines of research. This base of research is reflected in three key design principles: (1) Blending a synthetic phonics approach with support for word patterns and high frequency word learning reflects a powerful model of explicit and systematic phonics instruction; (2) Combining word-level instruction with engaging text (and writing activities) that reinforce letter-sound targets creates a mastery oriented and motivating approach to building strong readers; and (3) An aligned system of progress monitoring and instructional planning is critical to effective instructional differentiation.

Design principle 1: *Blending a synthetic phonics approach with support for word patterns and high frequency word learning reflects a powerful model of explicit and systematic phonics instruction.*

Explicit and systematic phonics instruction selects a specific set of letter-sound targets to introduce at any given point in time and then slowly adds in new targets in an intentional order. Such instruction begins with easier targets (e.g., letters that largely represent only one sound) and moves toward more complex and abstract relations over time (e.g., letter pairs that can represent multiple sounds or more complex syllable structures; DeGraaff, Bosman, Hasselman, and Verhoeven, 2009). Research consistently demonstrates that explicit phonics instruction provides important, lasting benefits to children's reading accuracy, and this is one of the most emphasized aspects of phonics instruction for English language learners, as well as for children struggling to learn reading (August, et al., 2005; Brady, 2011; DeGraaff, et al., 2009; Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, and Shanahan, 2001; Torgesen, 2006; Torgeson, Alexander, Wagner, Rashotte, Voeller, and Conway, 2001; Vaughn, 2007). One of the reasons for the importance of explicit and systematic instruction is the nature of English. English has the most inconsistent orthography of all languages (Goswami, Ziegler, Dalton, and Schneider, 2003; Goswami, 2005). Across even the most common words in English, letter-sound relations are inconsistent and variable. For such an inconsistent language, instruction needs to work to minimize children's confusion and maximize children's ability to use and apply learned knowledge about the code.

An assumption of explicit phonics instruction is that there is value in maximizing children's knowledge about letter-sound correspondences as they begin to read, and that such knowledge leads to efficiency in and accuracy of reading. This assumption is well-grounded in empirical research (e.g., Share, 1995; Torgesen, et al., 2001; Vellutino, Scanlon, Sipay, Small, Pratt, Chen, and Denckla, 1996; Ziegler and Goswami, 2005); and in developmental theories of how children learn to read (Ehri, 2005; Ziegler and Goswami, 2005). Indeed, reading developmental theory suggests that "readers learn … by forming connections between letters in spellings and sounds in pronunciations of the word . . . The connections are formed out of readers' knowledge of the alphabetic system. This includes knowledge of grapheme-phoneme relations

and phonemic awareness, that is, knowing how to distinguish the separate phonemes in pronunciations of words" (p. 170, Ehri, 2005). As children begin to consolidate this grapheme-phoneme information into word patterns, these larger units of words play a role in word reading. However, the basis for this learning is the alphabetic code.

Across the various methods of explicit and systematic phonics instruction, however, there is not a clear consensus about whether one approach is superior to another, although the trend of the data is to show either no differences or a slight advantage to synthetic phonics, particularly in the early grades (Brady, 2011; Johnston, McGeowan, and Watson, 2012; National Reading Panel, 2000; Torgesen, 2006; Walton, Walton, and Felton, 2001; Wyse and Goswami, 2008; Ziegler and Goswami, 2005). Theoretically, both synthetic and analytic phonics work to make the code systematic, but make different demands on children in the process. For example, in analytic phonics children learn to approach words as having patterns (e.g., –og, –ag, –it). In this method, children are taught to rely on their growing knowledge of patterns to decode (e.g., they are taught to draw an analogy among the words *van*, *man*, and *tan*). In synthetic phonics, children learn to understand the varied relationship between a single sound and a letter or set of letter combinations and then use this knowledge to blend letter combinations into sounds to decode words (DeGraaff, et al., 2009). These two approaches both seek to make the task of "cracking the code" easier for children, but do so in different ways. For example, English has more regularity in syllable- or rime-level units than it does in single sound-level units. Thus, a focus on teaching children to decode using knowledge of rime- or syllable-level units minimizes the exceptions children encounter but maximizes the *amount* of information children will need to learn. For example, for children to use rime-level information to read the 3,000 most common one-syllable words of English, children would need to remember approximately 600 different orthographic patterns (Goswami, 2005; also Treiman, Mullennix, Bijeljac-Babic, and Richmond-Welty, 1995). In contrast, a synthetic phonics approach would seek to minimize the information children need to remember by focusing on far fewer single sound-letter combinations and teaching children to use this granular information to blend into syllables, rimes, and words. However, the trade-off is that children are also likely to encounter many more exceptions to the information taught during the learning process. In English, most exceptions or irregularities exist at the single sound-letter level (e.g., the letter "a" appears in these common words and makes a different sound each time: *cat*, *was*, *saw*, *made*, *car*; from Goswami, 2005).

Recent research points to the potential importance of children being able to switch between using larger spelling units (such as a rime) and smaller spelling units (such as a phoneme-letter) when reading English (Ziegler and Goswami, 2005). In these experimental studies, children who were good readers demonstrated an efficient approach to reading, in which they would switch between their use of rime or syllable information and single sound-letter information to read (Goswami, et al., 2003; Walton, et al., 2001; Ziegler and Goswami, 2005). What is important within this research is the fact that children would switch between these approaches as a result of the words they encountered—*not* because they had received any particular instructional method teaching one way or the other. This suggests that the children who are best at learning to decode may need to access the different approaches to word decoding: using phonetic information at a single sound/phoneme level and using phonetic patterns at a syllable- or rime-level. This research suggests that instructions that help children make choices about switching between these different approaches may be most effective.

LINKS TO CKLA

The CKLA program (particularly within Grades K–3) is typically described as a synthetic-phonics approach; however, the lessons actually take a multipronged approach to teaching children phoneme-letter patterns, sight words, and word patterns. Thus, CKLA reflects a blended approach consistent with the latest research on phonics instruction. In CKLA, the Kindergarten year is the year that most strongly adheres to a strict synthetic-phonics approach. In Kindergarten, children are first taught to relate a single spelling to each of the forty-four sounds of English. CKLA seeks to minimize the challenges of this approach (i.e., that children will encounter exceptions to what they know) by teaching children the *most common and least ambiguous spelling for each sound* of English (e.g., a_e is taught for a long "a" sound because there are few exceptions). Thus, in Kindergarten, children learn to read the most frequent spellings for the sounds of English and learn sound-letter patterns that are likely to follow the rules (as the spellings taught first are also the least ambiguous). As with classic synthetic-phonics programs, CKLA also places an emphasis on phonemic-awareness skills in Kindergarten (i.e., blending/segmenting), which research has shown to be critical in supporting many young readers, particularly in Kindergarten (Torgesen, et al., 2001; Blachman, Tangel, Bail, Black, and McGraw, 1999). Although few long-term differences have been seen between synthetic phonics and other explicit phonics programs, there is some evidence that synthetic phonics may provide an early

boost to reading development in the Kindergarten year (Foorman, Francis, Shaywitz, Shaywitz, and Fletcher, 1997).

However, in looking at CKLA phonics instruction more holistically (i.e., across K–3), it's clear that the approach cannot be described as purely synthetic. First, across K–3, children are taught sight words as whole units (even beginning in Kindergarten). This instruction, along with the phonics instruction, ensures that benchmark lists of sight words (e.g., Dolch/Fry) are known by children within grade-expected time frames (See the *CKLA Program Guide* for more information on the links to the Dolch and Fry words list at https://s3.amazonaws.com/amplify-assets/pdf/ckla-program-guide.pdf. Further, the instructional approach taken in Grades 1–3 is blended: children are still given information in single sound-letter patterns, but this information is introduced in ways that also build their understanding of larger-grained units of words (e.g., syllables, rimes). For example, research states that the rime pattern *–ight* occurs approximately ninety times in English, thus making it a potentially useful rime pattern to know (Goswami, 2005). Although the CKLA program would not teach *–ight* as a whole, it will teach that "igh" is an alternative spelling for the long "i" sound. Within such a lesson, children will examine words that have this "igh" spelling versus words with other spellings of the long /ie/ sound (e.g., i_e) and will—explicitly and with teacher guidance—examine lists of words following these two spelling patterns and discuss commonalities among words. In this way, the CKLA approach, while synthetic in its premise, actually embeds instruction around phoneme-level *and* word-, syllable-, rime-level information. Thus, it shows consistency with the research that speaks to the value of learning multiple strategies when learning to read English.

Design Principle 2: *Combining word-level instruction with engaging texts (and writing activities) that reinforce letter-sound targets creates a mastery oriented and motivating approach to building strong readers.*

In reading-skill acquisition, the end is to achieve fluent, automatic reading, which is defined as "efficient, effective word-recognition skills that permit a reader to construct the meaning of text" (Pikulski and Chard, 2005, p. 510). To build such automaticity, practice is a necessary component (Willingham, 2009). For example, research finds that children's literacy and language learning can be influenced by the actual

number of exposures a child is given over the course of a long instructional period to specific targets, suggesting that practice which is focused on intentionally building exposure to specific sound-spelling patterns may be critical for supporting all learners (McGinty, Breit-Smith, Fan, Justice, and Kaderavek, 2011; Proctor-Williams, 2009; DeGraaff, et al., 2009). Yet, research also finds that simple drilling is not an effective approach to supporting children's long-term acquisition of information (Cepeda, Pashler, Vul, Wixted, and Rohrer, 2006). The research on learning and memory tends to point to three key components of effective practice that are important for reading programs to consider: (1) motivation and attention, (2) understanding basic skills, and (3) extended practice. The primary link among these ideas is that each is seen as a strategy that can facilitate memory for information (Baker and Wigfield, 1999; Bandura, 1997; Cepeda, 2006; Willingham, 2009).

Regarding motivation and attention, research finds that emotionally interesting information commands attention and is more easily remembered. However, this may not necessarily mean that reading practice must center on books or texts that may *seem* motivating to children but that disregard other important aspects of practice, such as capacity for *correct practice*. Learning theories point to the important link between a sense of self-efficacy and motivation (Bandura, 1997). Notably, a critical component of self-efficacy—or sense of capacity within a certain situation, such as reading—comes from the sense of mastery within practice. When children feel successful, the task is motivating, and this sense of success or mastery builds their belief in their own efficacy and capacity for the larger task at hand (Usher and Pajares, 2008). Such success naturally builds confidence and willingness to try a new, potentially more difficult task and/or continue to persist in the same task.

The second aspect of practice that research highlights is the importance of mastery of basic skills. This base of research points to the importance of building *automaticity* within a skill set, whether in reading or in any other skill (Just, Carpenter, and Keller, 1996; LaBerge and Samuels, 1974). Cognitive science distinguishes between *knowing* something—such as knowing aspects of letter-sound relations—and knowing something so that a degree of *automaticity* has been achieved (Willingham, 2009). The difference is that the first level—the *knowing* level—requires that effort is put forth, first to retrieve relevant information that is known and then to use that information in working memory to problem solve (e.g., sounding out in reading). There are limits to this process of retrieval and problem-solving in terms of how much information can be retrieved

and used at once (Baddeley, 1992). When something is practiced enough—even something that is *known*—the brain begins to handle the information differently so that more information can be used at once (some call this "chunking") and information can be used more quickly, with less effort. An analogy drawn in the literature is to driving. When you first start driving, it takes all of your concentration to go through the individual steps involved in driving. However, once the task is learned and as it becomes automatic, the small steps of driving (e.g., turning the key, checking the mirror, changing the gear) become consolidated and automatic; it is easy at this point to drive while also conversing or thinking about other things (Willingham, 2009). For reading development, this automaticity corresponds to the stage of development called "consolidated alphabetic" (Ehri, 2005), in which children not only know letter-sound correspondences—and use them fairly accurately—but children are able to read in a way that seems effortless. From a cognitive perspective, the only route toward this level of reading development is practice (see a discussion in Willingham, 2009). This explains, in part, why there is such a strong relation between strong readers and how much they read (Cunningham and Stanovich, 1991, 1997).

Finally, research suggests that practice must offer opportunities for extended learning in different contexts and at different points in time. The premise for this recommendation comes from the science of learning and memory and the concept called distributed practice. Distributed practice refers to the idea that learning is facilitated when a child (or adult) is given multiple exposures spaced over time to a concept or skill (Carpenter, Cepeda, Rohrer, Kang, and Pashler, 2012; Cepeda, et al., 2006; Gerbier and Toppino, 2015). One reason for this effect may be that spacing out practice naturally leads to slight variations in the contexts (or situations), and this enhances the practice effect (see Toppino and Gerbier, 2014). When there is variation in the context (e.g., practicing a letter-sound relationship in various words or encountering a word in various stories or in a story and discussion later), a person now has multiple episodes, or situations, that link to a particular idea, and this helps build deeper understanding (and more robust memory) for the skill or concept (see also Willingham, 2009).

LINKS TO CKLA

Collectively, research points to practice experiences that are successful (thus motivating), that allow for the building of automaticity within basic skills (thus intense and consistent), and that build capacity to extend skills into varied contexts. The CKLA phonics program was designed with the cognitive science of practice

in mind: it explicitly weaves in all three dimensions of systematic practice across lessons, units, and grades. In K–3, the program teaches children 150 spellings for the 44 sounds of English. It introduces an average of 5–10 letter-sound relationships within each unit of instruction; each unit lasts approximately 2–3 weeks. The program provides daily lessons in phonics. The lesson formats vary, but in every lesson, there is practice in the basic letter-sound relationship(s) of focus, which includes a fairly intensive set of activities to further practice these relationships (e.g., approximately 15 minutes daily of writing, spelling, and word-level reading and word sorting, using sound-spellings that were just taught). Then, each day, children are given the chance for extended practice through independent and/or small group reading or writing activities. These opportunities for extended practice reflect naturalistic activities through which children are building other skills, such as grammatical skills related to sentence activities, genre writing, or reading and reading comprehension. For example, children may be responding to questions from texts, using words in sentence-level work, or applying their knowledge of sound-spelling correspondence within the planning, drafting, and editing processes of various writing genres that they are taught.

One of the unique aspects of extended practice afforded by CKLA is through the use of original, completely decodable student readers. In K–3, children read chapter books that are 100 percent decodable because they correspond to the unit of phonetic instruction in which they are placed. CKLA's developers designed their own books because they wanted to create texts that offered children extended reading practice that was both mastery oriented *and* engaging. In traditional leveled readers, the emphasis is on engaging and authentic texts, but these texts tend to only be loosely related to the phonetic code children know (e.g., leveled along varied parameters of language and vocabulary but not by phonetic patterns; see Nelson, Perfetti, Liben, and Liben, 2012; Shanahan, 1983). Basal readers—in which the code is tightly controlled within a text—have typically failed to represent authentic literature, having only simplified story structure, vocabulary, and repetitive sentences. CKLA seeks to balance the strengths of both these types of readers. To achieve this, the books are phonetically controlled, meaning that the words used contain only the sound-spelling patterns and sight words taught to date. However, CKLA's developers created a database that provided every single English word that adhered to the sound-spelling patterns taught to date in each unit of instruction. This provided a wealth of words that the authors could draw upon, which helped them craft chapter books on interesting topics, such as travel, friendship, and geography (e.g., in Grade 1, there is a book about a young girl who travels to Mexico and visits the Aztec ruins and another about a family on a sightseeing trip in London), while also building in practice with target sound-spelling patterns. For example,

a reader from early in Grade 1 targets the "ee" spelling of the long /e/ sound (among other letter-sound patterns). The reader is one hundred pages and focuses on the interactions among a grandmother and her two grandchildren as she relays stories from her past, including trips to Hong Kong, the Barrier Reef, and a ranch out West. The book has seventeen short stories/chapters and across this content offers children seventy-one opportunities to practice the "ee" spelling pattern across thirty-three unique words (e.g., *keep, three, green, deep, cheer*). It is also important to note that the texts are appropriately complex (i.e., Lexiles on the books reflect grade-appropriate levels; see the *CKLA Program Guide* at https://s3.amazonaws.com/amplify-assets/pdf/ckla-program-guide.pdf and thus do not reflect the typical controlled basal reader in which language is often simplified and repetitive across the book.

In addition to the core classroom activities just described, the program offers two additional tools for extended practice. The first consists of spelling lists designed to be practiced at home. These spelling lists sometimes correspond to sound-spellings just taught and sometimes return to previously taught patterns. This design choice—to use spelling lists to practice already learned sound-spelling patterns—is a direct implementation of the idea of distributed practice (i.e., returning to information after time has passed), which has been shown in cognitive science to be critical for long-term learning. Extended practice is also provided in the form of fluency work explicitly built into the program. In Kindergarten and Grade 1, repeat readings of decodable texts are supported.

Starting in Grade 2, there are additional online Fluency Packets (see https://s3.amazonaws.com/amplify-assets/pdf/ckla-program-guide.pdf) that correspond to each unit. Fluency work, generally, is seen as valuable to children's rate, accuracy, *and comprehension* (National Reading Panel, 2000; Samuels, Ediger, and Fautsch-Patridge, 2005). This approach to fluency within CKLA reflects the goal of fluency work as an integrated task (one that supports decoding and comprehension), and the fluency work sits within the broader structure of the Skills strand, which places emphasis on practice for mastery and motivation. Thus, fluency work is an integrated aspect of the program's systematic approach to instruction and practice.

Design Principle 3: *An aligned system of progress monitoring and instructional planning is critical to effective instructional differentiation.*

Research shows that young children show significant variability in their acquisition of reading skills. Early recognition of differences in learning rates, combined with adjustments to instruction that work to support weaknesses, provide a powerful combination for preventing reading difficulties. Such intervention is essential before difficulties become pronounced and eventually intractable (e.g., Fletcher and Vaughn, 2009; Fuchs, Fuchs, and Compton, 2012; Vellutino, et al., 1996).

The importance of blending ongoing data collection within a strong baseline curriculum is a critical component of differentiation and instructional planning. Knowing what the goal of instruction is, how the pace of learning is expected to proceed, and that a variety of opportunities for practice and extension are offered is necessary to understanding children's abilities. In fact, research finds that with a strong reading curriculum and active monitoring of progress (with adjustments made to support differentiated needs), 80 percent of children should be reaching grade-level proficiency without additional intervention (Batsche, Curtis, Dorman, Castillo, and Porter, 2007). Curriculum-based assessments reflect a key component of this type of ongoing differentiated instruction, as these measures provide the teacher direct input to instructional planning (Busch and Reschly, 2007). Research into instructional differentiation finds that varying the group size, the focus of instructional target, and the type of activity (e.g. independent reading vs. reading aloud with a teacher) can matter substantially to what children are learning (Connor, et al, 2009; Al Otaiba, Connor, Folsom, Greulich, Meadows, and Li, 2011). Research also finds, however, that one of the challenges in providing differentiated instruction to students is a lack of specifically designed activities that align to the general curriculum. For example, research found that general training on differentiation and a base of activities (that may not necessarily be designed for use within a curriculum) was less effective in supporting student learning than a system of assessment, curriculum, and added or supplementary activities that are aligned to the baseline curriculum (Al Otaiba, et al., 2011).

LINKS TO CKLA

The CKLA approach to teaching phonics and reading/writing fundamentals is that of an integrated system of assessment, general curriculum, and supplementary curricular materials to be used for differentiation. Children are given assessments of their code knowledge each year as an initial placement process. From that, children are placed into a unit of instruction and, if this unit is below grade level, are given recommended added or supplementary differentiated instruction through the use of the *Assessment and Remediation Guide* (A&R Guide). The A&R Guide tracks to each specific unit of instruction and provides ideas for added or differentiated instructional activities around all key skills areas within Kindergarten and Grade 1. In second grade, the remediation materials emphasize activities to focus on automaticity with the code and fluency in later grades. Further, the A&R Guide provides specific progress-monitoring tools to allow teachers to consider children's broader progress and response to the curriculum (with, again, suggestions and guidance on differentiation, depending on the results of these tools). Teachers can use these monitoring tools as needed. However, all children are given the curricular-based measures embedded into the general curricular materials. These unit-level assessments, designed as quick checks to ascertain how well children are learning within each unit of instruction, are accompanied by guidance about how to review and/or weave in individualized support from the A&R Guide when children fall below expected levels within these measures.

Conclusions: The CKLA program is designed to take a systematic and explicit approach to teaching the English code. The program's integrated approach to instruction, practice and extension, and progress monitoring/individualization creates a systematic instructional approach designed to support all learners and reflects the knowledge of cognitive science and reading development within its instructional apparatus.

Summary and Closing

The key premise of the CKLA program is that it reflects three primary ideas: (1) the two-strand approach to ELA instruction in K–3, which is grounded in the Simple View of Reading theory; (2) the language-based and knowledge-driven approach to building children's capacity with complex text; and (3) the importance of

explicit and systematic instruction to build automaticity with the written code. The two-strand approach to language arts within CKLA is grounded in the empirically supported theory that reading comprises skills in decoding and in listening comprehension. The result is a program in which decoding and comprehension are given equal weight, and equal time, within the ELA block and teachers are provided two complementary sets of materials designed for daily use and for intentional support of each aspect of reading development.

The first set of materials, the Listening and Learning strand, is a daily read-aloud program that approaches comprehension skill development, vocabulary acquisition, and knowledge-building as interrelated developmental processes that grow hand-in-hand. Lessons within the Listening and Learning strand involve forty-five to sixty minutes, *daily,* of oral language-based instruction, including a read-aloud, discussions emphasizing text recall and higher order thinking about text, writing activities to extend understanding of the text, and explicit vocabulary instruction. Unique to the program is the fact that these language and comprehension activities are conducted within a content-oriented context.

The second set of materials, the Skills strand, is a comprehensive, explicit, and systematic phonics program designed to build decoding, fluency, and writing/spelling skills. The Skills strand involves sixty minutes of daily instruction in which children are taught a specific set of letter-sound patterns within a unit of instruction (typically one to three weeks) and are given opportunities to practice and use these in word-, sentence-, and text-reading tasks as well as within writing tasks. One of the unique aspects of extended practice afforded by CKLA is through the use of original, completely decodable student readers. CKLA's developers designed their own books because they wanted to create texts that offer children extended reading practice that is both mastery oriented *and* engaging. Although readers only present sound-spelling patterns that children have been taught, CKLA's unique database was used to provide authors a complete look at all the words available in English that children would know how to decode at any point within the curricular pathway. The result is a set of chapter books that correspond to each unit of instruction and are on interesting topics, such as travel, friendship, and geography (e.g., in Grade 1, there is a book about a young girl who travels to Mexico and visits the Aztec ruins and another about a family on a sightseeing trip in London). Lastly, the Skills strand involves a system of progress monitoring and aligned differentiation activities to provide a comprehensive set of tools for effective instructional planning.

In closing, this paper has intended to highlight critical features of the CKLA program and to demonstrate the research foundations for the design principles that guided its development. This paper is not an exhaustive review of the literature related to reading and reading instruction, nor does it fully present the extensive instructional materials available through the CKLA program. However, the information included in this paper shows that CKLA goes far beyond simple CCSS alignment. Rather, the CKLA program reflects what is known from research—though often poorly represented in classrooms—about children's learning and development related to both oral and written language. As such, the program reflects an aligned system that addresses the standards and, more importantly, equates what science says to what is done in the classroom.

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