Research Foundation: Key Foundations by Hatch™

Key Foundations by Hatch™:

Key Foundations by Hatch was crafted exclusively for Pre-K and Kindergarten students. It provides a structured approach to early literacy, instilling fundamental skills that form the bedrock of a successful academic voyage. Structured around 10-minute print-based lessons, Key Foundations brings linguistic phonics and English morphology to life, demystifying the skills needed for cracking the alphabetic code and spelling. The program includes leveled readers, consumables, teachers' guides, and other invaluable resources that work harmoniously with Ignite by Hatch®, an interactive game-based platform designed to advance grade-level readiness in just 30 minutes per week of online play. This holistic approach not only fosters foundational reading skills but also promotes overall growth in mathematics, literacy, and child development. With Key Foundations, educators can set their students on a path of lifelong learning and achievement.

About Hatch:

Hatch Early Learning is the trusted leader in early education, providing administrators and teachers with actionable data on student readiness in multiple domains. Our research-based solutions offer valuable insights into student progress, enabling informed decision-making and targeted interventions. Streamline paperwork, save teacher time, collaborate more effectively with families, and foster a supportive educational environment with our intuitive platforms. Join Hatch Early Learning to empower educators, enhance student outcomes, and unlock the full potential of your early learners.

Table of Contents

Introduction to Key Foundations by Hatch™: A Science-Based Approach to Pre-K Literacy Instruction

Key Foundations by Hatch™, which is now part of the Hatch Early Learning product suite, is a print-based literacy curriculum grounded in the science of reading. This literacy curriculum is designed for the pre-K classroom to unlock the building blocks for early literacy development and inspire a love of reading and writing in young learners. Key Foundations supports early literacy development through developing oral language, phonological awareness, alphabet knowledge, and an understanding of how print and books work. With this knowledge in place, children are ready to learn how to use the alphabetic code to write and decode words. To make early literacy learning simple and engaging for both teachers and children, Key Foundations is structured around 10-minute lessons which highlight different components of the curriculum. Key Foundations includes a comprehensive Lesson Book, 30 Pre-Decodable Books, a Game Book, Cue Cards, Picture Cards, Alphabet Bops, and Consumables.

When implemented in the classroom, Key Foundations is paired with Ignite by

Hatch™, a dynamic and independent digital learning platform designed to captivate and engage early learners. Ignite is designed to advance grade-level readiness in just 30 minutes per week of online play. Beyond literacy and language, Ignite fosters foundational skills across mathematics, science and technology, social–emotional development, physical development, and social studies. Together, these Hatch solutions support children's holistic development.

In addition, children's play in Ignite yields actionable data for educators in the Hatch Insights™ dashboard. With this data, teachers have evidenced-based insights at their fingertips that empower them to personalize small-group instruction and classroom activities. Ultimately, this pairing of Hatch solutions, Key Foundations and Ignite, can help teachers build foundational skills in young children that lead to continued academic success and a love of lifelong learning.

This research foundations paper will focus primarily on Key Foundations. For a full picture of Ignite, please see the *Ignite by Hatch™ Criteria Report*.

The Value of Supporting Literacy in Pre-K

Key Foundations emphasizes literacy development in preschool because this period is crucial for establishing the foundational skills that predict lifelong academic success. During early childhood, children's brains are highly plastic and flexible, meaning that children are ready for significant adaptation and learning. This flexibility enables the brain to form neural connections that support language processing and literacy skills. For example, research shows that preschoolers are exceptionally receptive to literacy skills like phonological awareness and alphabet knowledge (Bethlehem et al., 2022; Lonigan & Shanahan, 2009). As the brain matures, it becomes more specialized, reducing its capacity to reorganize and adapt (Center on the Developing Child, 2007). Therefore, early literacy experiences are highly important.

Early literacy instruction not only prepares children for immediate academic challenges but also has long-term benefits. Effective early literacy education increases the likelihood of children becoming proficient readers and writers, which correlate with higher academic achievement and graduation rates (Camilli et al., 2010). Moreover, literacy skills acquired in preschool predict reading comprehension proficiency by fourth grade—a critical predictor of a child's future educational trajectory and income level (Dickinson & Porche, 2011; Pace et al., 2019).

Additionally, early literacy instruction supports the rapid development of reading and vocabulary skills and reduces the Matthew effect, where children with early advantages in literacy progress faster than those who are less advantaged (Stanovich et al., 1986). It also helps in identifying and addressing literacy difficulties early on, promotes socio-emotional competencies, and enhances classroom behavior and engagement (Blair & Razza, 2007; Foorman et al., 2018). Consequently, investing in preschool literacy through programs like Key Foundations not only closes potential academic gaps but also equips children with the skills necessary for long-term educational success.

Why Support Literacy Development in Pre-K?

1. Preschoolers' brains are sensitive to and ready to learn early reading skills.
2. Early literacy instruction has long-term academic benefits.
3. A focus on early literacy can help close achievement gaps that widen throughout children's schooling.

The Role of the Science of Reading in Key Foundations

Key Foundations is designed based on the science of reading. The science of reading refers to a comprehensive body of research from multiple disciplines, including cognitive psychology, neuroscience, linguistics, and education, that explores how we learn to read, the best practices for teaching reading, and the underlying processes involved in reading acquisition and development. Research indicates that literacy instruction approaches based on the science of reading are highly effective in teaching children to read, especially those at risk for reading difficulties (Ehri et al., 2001; National Reading Panel, 2000).

A critical goal of science of reading approaches to early literacy is to support children in acquiring the alphabetic principle (Byrne, 2005). The alphabetic principle is the understanding that letters of the alphabet (and combinations of those letters) represent unique sounds that make up spoken words. Acquiring the alphabetic principle is fundamental to becoming a successful reader and writer. Once children understand the alphabetic principle and know how the letters of the alphabet connect to sounds, they can translate spoken words into written words, and written words into speech and, subsequently, can access the meaning of written language (Castle et al., 2018). In turn, children can write the words they can say, enjoy books, interpret text messages, understand road signs, and read a menu at a restaurant. Therefore, supporting children in acquiring the alphabetic principle is the key to unlocking the way written language works.

To acquire the alphabetic principle, the science of reading shows that children must be taught the foundations of literacy, including oral language, phonemic awareness, letter and letter–sound knowledge, and print and book awareness.

Oral Language

Oral language encompasses vocabulary, syntax, and discourse skills (Dickinson et al., 2003). From infancy, children rapidly expand their vocabulary, an early indicator of oral language acquisition (Biemiller & Slonim, 2001). This vocabulary development is enhanced by background knowledge, which helps children make sense of new words by integrating them into what they already know, thus improving communication and comprehension (Smith et al., 2021). As children's vocabularies grow, they learn to describe and convey specific details about their surroundings, further developing their expressive language skills. The skills to describe allow children to note similarities and differences and to learn to make comparisons, enhancing critical thinking and deepening their understanding of relationships between things. Once they can compare, children begin to organize concepts based on shared characteristics, learning to categorize which promotes abstract thinking and effective problem-solving. Finally, these language organization skills allow children to make associations between things, transferring prior knowledge to new situations.

Each stage of oral language development not only supports cognitive growth but also lays the critical groundwork for later reading and writing proficiency and academic achievement. Ultimately, proficiency in oral language enables children to write, to understand written texts and comprehend complex language structures.

Phonemic Awareness

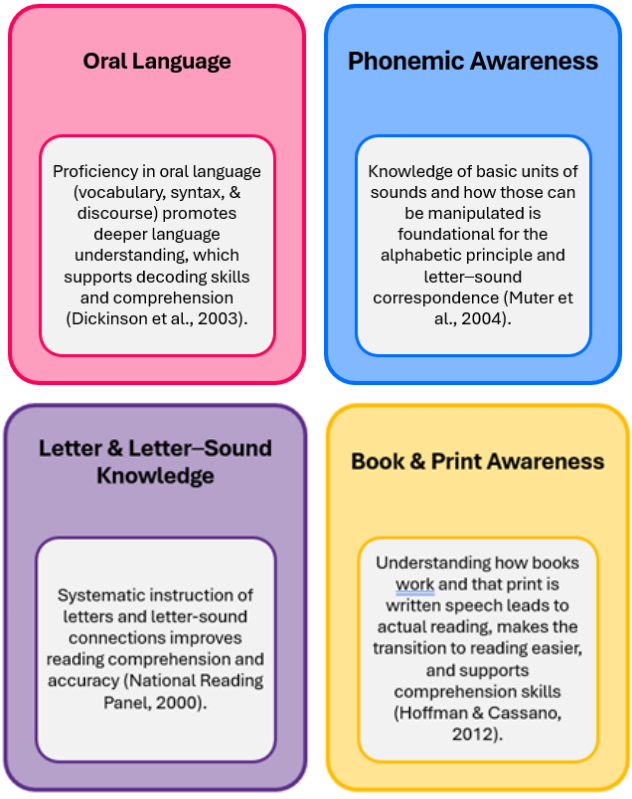
Phonemic awareness is the ability to recognize and manipulate phonemes, the smallest units of spoken language that form syllables and words. Children use phonemes in speech daily, but they must develop a conscious awareness of individual phonemes to learn to read and write. With phonemic awareness, children can identify specific sounds in spoken words, such as the /p/ sound in names such as Peyton, Philippa, and Kip (Ehri et al., 2001). This skill is essential for learning to write - connecting speech to print, helping children analyze word sounds and link them to corresponding letters and letter patterns (Clemens et al., 2021; Treiman, 1991). Furthermore, phonemic awareness is critical for decoding—blending sounds into recognizable words—and supports writing, reading fluency and comprehension, foundational elements for becoming a proficient reader (Ehri, 1991, 1994; Muter et al., 2004).

Letter and Letter–Sound Knowledge

Letter knowledge and letter–sound knowledge are fundamental components of early literacy. Letter knowledge involves recognizing and writing each letter with the correct formation, while letter–sound knowledge refers to the ability to identify sounds associated with specific letters or letter combinations (Huang et al., 2014). This understanding is essential for mastering the alphabetic principle, which is an understanding that letters systematically represent speech sounds (Byrne & Fielding-Barnsley, 1989). Crucially, letter–sound knowledge enables children to decode words by translating print into spoken language and to encode words by spelling them based on their sounds (Caravolas et al., 2001). These skills pave the way for independent and successful reading and writing development.

Book and Print Awareness

Book and print awareness is the understanding of how books and print work. This knowledge involves recognizing environmental print; handling books correctly; knowing that print flows from left to right and top to bottom; and identifying key parts of a book, like the cover, title, and author. It also encompasses recognizing letters and letter patterns and understanding that print conveys the message (Lefebvre et al., 2011). Strong book and print awareness fosters children's reading skills, supports comprehension skills, and makes the transition to reading easier (Hoffman & Cassano, 2012).



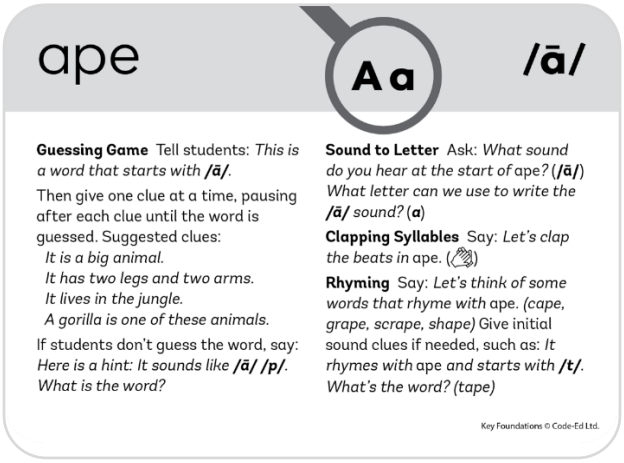
With a solid grasp of oral language, phonemic awareness, letter and letter–sound knowledge, and book and print awareness, children are well-equipped to master the alphabetic principle, effectively "cracking the code" for reading and writing. Key Foundations, rooted in the science of reading, meticulously supports the development of these essential literacy fundamentals.

Key Foundations is unique because it uses a speech-to-sound-to-print approach to teaching early literacy.

The Key Foundations Approach: Speech-to-Sound-to-Print

Science of reading approaches support children to acquire the foundations for literacy by systematically teaching foundational skills, including oral language, phonemic awareness, letter and letter–sound knowledge, and book and print awareness. The order in which these concepts are taught can vary across different types of literacy practices and curricula. The method of instruction for teaching the alphabetic principle and alphabetic code knowledge also varies. Some instructional approaches begin with letters and teach children to connect letters to sounds. Other instructional approaches begin with sounds and teach children to connect sounds to letters.

Key Foundations is unique because it uses a speech-to-sound-to-print approach to teaching early literacy. This approach uses the spoken language children already have as a platform for learning to manipulate and identify the sounds these words are made from. It then links these sounds to the letters or letter patterns that represent them in written language. In this way, Key Foundations starts with a focus on the oral language children bring to the classroom, ensuring all children can contribute to the class and work from what they already know. This oral language foundation naturally allows for the development of phonemic awareness, which is an oral language skill. The sounds the children identify are then linked to letters and letter patterns, teaching an understanding of the alphabetic code. This knowledge is then transferred to the tasks of learning to write and decode words. Ultimately, this speech-to-sound-to-print approach is strong because it leverages children's prior knowledge, their pre-existing knowledge of speech and language (Treiman, 2018), and it supports them in understanding how the alphabetic code works, instead of teaching them to memorize, abstract, and isolate items of knowledge.



Key Foundations activities start with sounds and help children identify names or words that have a target sound and then help them connect those sounds to letters.

Lessons in Key Foundations begin with familiar elements from children's everyday lives—such as the names of people, places, and common objects—and connects these elements to corresponding phonemic and alphabetic representations.

The Importance of Leveraging Prior Knowledge for Literacy Instruction

By implementing a speech-to-sound-to-print approach to literacy instruction, Key Foundations leverages the power of children's prior knowledge. Prior knowledge encompasses the experiences and information that children accumulate from birth through interactions with people, objects, and their environment. These continuous interactions are integral to their learning process and become ingrained in their memories, forming a robust foundation of background knowledge. Existing knowledge shapes how children perceive and approach new educational settings; they are not blank slates, but rather individuals rich with experiences that directly influence their capacity to learn. As children encounter new information, they integrate it with their existing knowledge or schemata, enhancing their understanding and expanding their intellectual horizons (Piaget, 1968).

Key Foundations effectively harnesses this prior knowledge, recognizing its invaluable role in enhancing literacy development. To successfully use children's prior knowledge, lessons in Key Foundations begin with familiar elements from children's everyday lives—such as the names of people, places, and common objects—and connects these elements to corresponding phonemic and alphabetic representations. This method not only makes learning contexts relatable and engaging but also bolsters comprehension, memory, fluency, and reading and writing speed by building on known words and experiences (Duke et al., 2012; Yates & Chandler, 1994). Neuroscience research supports this strategy, indicating that linking new information

to well-established knowledge enhances learning effectiveness (Shen et al., 2017). By deliberately activating and building upon what children already know, Key Foundations not only creates an inclusive educational atmosphere but also ensures that every child has a solid starting point for their journey into literacy. This connection between new and familiar information deepens understanding and retention, setting a foundation for lifelong learning and academic success.

Starting With Sounds Prevents Memorizing Exceptions

By employing a speech-to-sound-to-print approach, Key Foundations effectively introduces children to the complexities of the alphabetic code, including the concept that a single phoneme may be represented by different letters or letter combinations in English. For instance, the /j/ sound can be spelled as "j" in jump or as "g" in giraffe. This method teaches children from the start that phonemes like /j/ can have multiple representations, avoiding the need to teach these as 'exceptions' to what has previously been taught, at a later stage. Such an approach equips children with a practical understanding of the alphabetic system, preparing them for success as they encounter increasingly complex words in reading and writing. Ultimately, this Key Foundations approach ensures that the literacy skills children develop are robust and adaptable, supporting their ongoing educational journey.

Key Foundations effectively employs a speech-to-sound-to-print approach that systematically builds upon children's natural learning progressions—starting with their inherent oral language, enhancing phonemic awareness, and integrating letter knowledge and print awareness. This method leverages children's prior experiences and knowledge, makes learning more intuitive, and avoids rote memorization of isolated and often abstract information. By fostering a deep understanding of literacy skills, Key Foundations enhances retention of new learning and sets a solid foundation for future academic success.

Key Foundations Materials Are Designed to Support the Speech-to-Sound-to-Print Approach

The speech-to-sound-to-print approach taught through Key Foundations is embedded within two books of instructional materials: the Lesson Book and the Game Book.

Lesson Book

The lessons in the Key Foundations Lesson Book use research-aligned, evidence-based instructional practices that appropriately scaffold children's learning, from oral language to phonemic awareness to knowledge of print. Each lesson starts with what children know (oral language) and guides teachers in teaching a new skill (identifying sounds and sound patterns in words) before teaching about the letter(s) that represent the focus sound. These skills are then transferred to print, where children can practice recognizing and pronouncing letters in texts and learn to print letters correctly.

The Key Foundations Lesson Book is organized to support learning about each letter of the alphabet. The Lesson Book features four distinct types of lessons for each letter: Sound Hunts, Letter Hunts, Word Games, and Sound Games. (Note: Vowels have five lessons, as there are two Sound Hunts: one that focuses on the short vowel sound and one that focuses on the long vowel sound for each vowel letter.) Although the lessons appear in alphabetic order in the Lesson Book, they can be taught in any order.

Lesson type	Lesson description
Sound Hunts	Teachers guide children in recognizing and producing specific sounds, starting with familiar names that contain the target sound, then expanding to other words. For example, the phoneme /k/ might be introduced, and children might be asked to identify names that include it, like Kalani, Calvin, and Jack.
Letter Hunts	These activities link the target sound to a corresponding letter. Children practice identifying and writing the uppercase and lowercase versions of the letter, often using a rhyming book to help with recognition and printing.
Word Games	These activities focus on enhancing oral language, background knowledge, and language organization skills. Children guess words using clues related to the initial sound of the word, and details that are relevant to the meaning of the word. They also take part in activities that build vocabulary and teach skills for describing, comparing and categorizing everyday things, which deepens their understanding of words.
Sound Games	Through engaging games, children manipulate sounds in words to develop phonological and phonemic awareness. Activities might include clapping syllables, rhyming, and sorting words by initial sounds, all of which are essential skills for supporting early reading and writing development.

Game Book

The games in the Key Foundations Game Book are organized in a scaffolded manner based on how the skills develop for most children. The first games are oral language games that are designed and systematically ordered to begin with vocabulary and background knowledge and then advance through categorization. The next games are phonological and phonemic awareness games that provide explicit support for developing and mastering the sound analysis skills needed for learning to read and write. These games are designed to scaffold learning from working with hearing sounds and sound patterns in whole words, to working with individual sounds in words.

Oral language games	
Game type	**Game description**
Vocabulary & background knowledge	Children practice naming various items, identifying similarities and differences, discussing everyday objects, and using adjectives to describe living and nonliving things.
Describing	Children describe animals, objects, and food in different ways, discuss the functions of everyday items, and identify what makes them work.
Comparing	Children describe and compare living and non-living things based on different qualities, identifying similarities and differences among groups of animals or items.
Categorization	Children group living and nonliving things based on shared qualities, identify differences among similar items, and discuss reasons why certain items belong together in a group.

Phonemic awareness games	
Game type	**Game description**
Syllables	Children sort, match, and manipulate syllables, identifying words by syllable count and pronouncing words made by deleting a syllable.
Rhyming	Children match rhyming pairs, identify non-rhyming words in a set, complete sentences with rhymes, and generate rhyming word groups.

Blending	Children blend onset and rime, individual sounds, and rhyming sounds, and sort words by initial sounds.
Segmenting	Children break words into individual sounds, count sounds for matching or contrasting, and sort by the number of sounds.
Recognizing & isolating phonemes	Children identify, match, and manipulate initial sounds, including deleting or swapping sounds to create new words.
Final sound awareness	Children focus on final sounds by identifying, matching, and deleting them.
Long & short vowels	Children identify, match, and differentiate long and short vowel sounds in words, enhancing vowel sound recognition.

Key Foundations Materials Are Designed to Support Engagement and Learning

Learning Science Based Design Principles of Key Foundations:

1) Discovery-Based
2) Playful
3) Quick Lessons
4) Practice Opportunities in a Digital Learning Platform

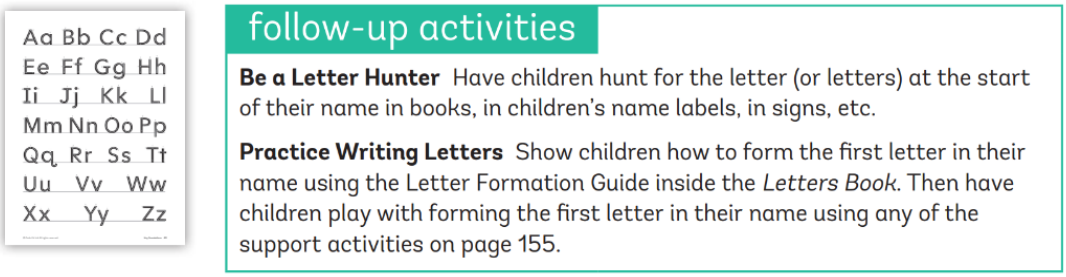
The lessons and games presented in Key Foundations are designed based on principles from the learning sciences on how children learn best. Key Foundations incorporates these principles through engaging, playful, and effective lessons that spark children's natural curiosity and cultivate their passion for learning. Moreover, the integration of Key Foundations with Ignite allows children to enhance their literacy skills through an engaging digital platform, reinforcing learning through both print and digital resources.

Discovery-Based Learning

Key Foundations embodies principles from the learning sciences through its integration of discovery-based learning. Discovery-based learning emphasizes children's active engagement in creating their own knowledge through exploration and interaction with their environment. It values the role of learners as active participants who explore materials, engage in group discussions, and participate in hands-on activities, which helps them apply and extend knowledge independently (Alfieri et al., 2011; Mayer, 2004). This educational approach increases personal investment and curiosity and leverages children's natural inclinations to explore, allowing them to construct knowledge authentically. Discovery-based learning typically incorporates varying levels of support from educators, who guide children by responding to their cues and providing appropriate challenges (Fisher et al., 2013). This method is particularly effective in early childhood settings because it fosters

cognitive skills, such as memory retention and critical thinking, by emphasizing self-generated learning and the activation of prior knowledge (Hopkins et al., 2019; Slamecka & Graf, 1978).

In Key Foundations, discovery-based learning is integrated in activities that encourage children to connect new literacy concepts with their prior knowledge and experiences. Activities like Sound Hunts and Letter Hunts ask children to identify phonemes and letters within familiar contexts, enhancing both engagement and comprehension. Through creative tasks, such as drawing items associated with specific sounds, children deepen their literacy connections by expressing understanding in unique, personalized ways. These activities not only support the development of literacy skills but also cultivate essential lifelong learning skills, including observation, inquiry, and problem-solving. By involving children in generating their own learning content and solutions, Key Foundations effectively harnesses the educational benefits of discovery-based learning, significantly enhancing memory retention and fostering a proactive learning attitude.



In these follow-up activities for a Letter Hunt, children engage in discovery-based learning when they are asked to find the letters in their classroom supplies.

Playful Learning

As well as emphasizing discovery-based learning Key Foundations also integrates playful learning elements, creating contexts in which children can learn through play. Playful learning is a pedagogical approach that incorporates enjoyment and exploration into educational settings, deeply engaging children and motivating them intrinsically (Zosh et al., 2022). It involves activities that are active, engaging, meaningful, social, iterative, and joyful, all crucial elements for fostering children's problem-solving and critical-thinking skills and focus. This form of learning ranges from free play, which is unstructured and spontaneous, to guided play (with adult support) that is focused on learning goals and finally to structured games with specific

rules (Hirsh-Pasek et al., 2015; Zosh et al., 2018). Each type of play contributes uniquely to child development, making playful learning a versatile and impactful educational strategy.

Key Foundations integrates playful learning primarily through guided play, effectively balancing child-led exploration with strategic teacher guidance to advance literacy skills. In this model, teachers facilitate rather than direct, using open-ended questions and participatory play to subtly steer children toward educational objectives without diminishing the joy and creative freedom of play (Weisberg et al., 2013). Activities within Key Foundations, such as Word Games, Sound Games, Letter Hunts, and interactive storytelling, are designed to be fun and socially engaging, enhancing the literacy lessons with a layer of play that encourages active and meaningful participation.

The incorporation of playful learning in Key Foundations is pivotal for early childhood education because it aligns with developmentally appropriate practices, catering to young learners' cognitive and emotional stages (Hirsh-Pasek et al., 2009; Lillard & Else-Quest, 2006). Playful learning taps into children's natural curiosity and their ability to learn through experimentation and engagement, which are essential for holistic development (Bonawitz et al., 2011). Research supports the efficacy of playful learning, indicating that children engaged in such activities often exhibit superior cognitive outcomes in areas like numeracy, literacy, and language development compared to children in more traditional learning environments (Van Oers & Duijkers, 2013; Walsh et al., 2006). By fostering an environment rich in social interaction and language use, playful learning not only enhances immediate educational outcomes but also sets the foundation for long-term academic success and a lifelong love of learning (Han et al., 2010; Roskos & Christie, 2013; Saracho, 2012).

Quick 10-Minute Lessons

In addition to offering playful and discovery-based learning opportunities, Key Foundations meets the needs of its youngest learners through its brief 10-minute lessons. The brevity of these lessons is essential for both logistical and developmental reasons. Logistically, preschool classrooms face significant time constraints, with limited hours each week to cover extensive material that is necessary for children to be kindergarten ready. In addition, there are routine delays caused by the needs of young children, such as longer bathroom breaks and transition times (Bustamante et al., 2018; Early et al., 2010). The brief lessons in Key Foundations help to optimize the limited instructional time available, ensuring that educators can deliver the curriculum efficiently and effectively.

From a developmental standpoint, the brevity of these lessons is key in maintaining children's engagement—an essential component of effective learning (Tare et al., 2010). Young children have attention spans that typically range from 8 to 12 minutes, aligning perfectly with the duration of Key Foundations' lessons (Lin, 2022). This alignment helps to maximize focus and learning potential by matching educational activities to the natural attention capacities of preschoolers, who also have limited abilities to manage attention, emotion, and behavior over extended periods. Therefore, the 10-minute lesson structure not only suits their developmental stage but also enhances their overall learning experience by keeping them engaged and attentive throughout each session.

Multiple Media for Learning

Finally, Hatch Early Learning enhances the effectiveness of learning experiences for young children by offering Key Foundations, a print-based solution, and Ignite, a digital solution, together in one package. Through this combination of a print-based and digital solution, Hatch leans into the benefits of learning from multiple media based in the learning sciences.

At a fundamental level, it is important for early childhood classrooms to have both non-digital and digital learning resources because children today are "digital natives," meaning that they were born into a world filled with technology. Consequently, it is

important for early childhood educators to adapt to the status quo and include technology use in their classrooms.

Beyond introducing children to technology, educators should note that children learn more when they use multiple mediums for learning than when they only use one (Neuman et al., 2021). Recent research suggests that when children engage with literacy-focused materials encompassing both teacher-supported lessons and digital games, they exhibit greater gains in early literacy skills compared to when they engage with either set of materials alone (Neuman et al., 2021). The combination of media for learning exposes children to different sets of processing tools, which, in turn, helps them retain the information for longer (Neuman et al., 2022). Therefore, it is not surprising that memory retention is a key benefit of using multiple mediums for learning. By engaging in different forms of processing, children can build more connections between different concepts and situations and use more sensory channels (Clark & Mayer, 2024). In turn, by using multiple mediums for learning, children can remember the information for longer periods of time. Ultimately, information that is remembered is learned.

Overall, Key Foundations skillfully combines principles from the learning sciences to create an enriching and effective learning environment for preschool children. By incorporating both discovery-based and playful learning approaches alongside concise, developmentally appropriate lessons that can be paired with digital game-based learning experiences, Key Foundations not only enhances children's literacy skills but also fosters a deep, lifelong passion for learning. This strategic blend of design features ensures that learning is engaging, meaningful, and aligned with the natural developmental stages of young learners, setting a solid foundation for future educational success.

Key Foundations Materials Are Designed to Support Teachers' Instructional Practices

In addition to being designed based on principles from the learning sciences, Key Foundations is thoughtfully designed to support teachers with high-quality instructional practices. These practices are intended to help teachers effectively use the program in their unique classroom settings. Key Foundations incorporates three key instructional practices: scaffolded instruction, modifications and extensions, and assessment and progress monitoring. These features give teachers the tools they need to adapt lessons to meet diverse learning needs and to keep track of student progress.

Scaffolded Instruction

Scaffolded instruction is a teaching method in which educators provide structured support to help students learn new knowledge, skills, or concepts that they couldn't achieve independently. This support, which can include guidance, prompts, and demonstrations, is designed to build upon students' existing knowledge, making the new information more accessible and relatable (Wood et al., 1976).

The scaffolded instruction process begins by activating students' prior knowledge that is relevant to the new content. Teachers then help students connect this existing knowledge with the new information, illustrating the application and relevance through clear examples and models (Kamil et al., 2011). As students grow more proficient, teacher support is gradually reduced, which encourages them to become independent in their learning (van de Pol et al., 2010).

All Key Foundations lessons and games follow this scaffolded instruction approach, in that the instructions for each game and lesson support teachers in activating children's prior knowledge, connecting their knowledge to new information, and modeling new skills. This scaffolded instruction approach not only enhances understanding but also fosters students' ability to apply new skills autonomously.

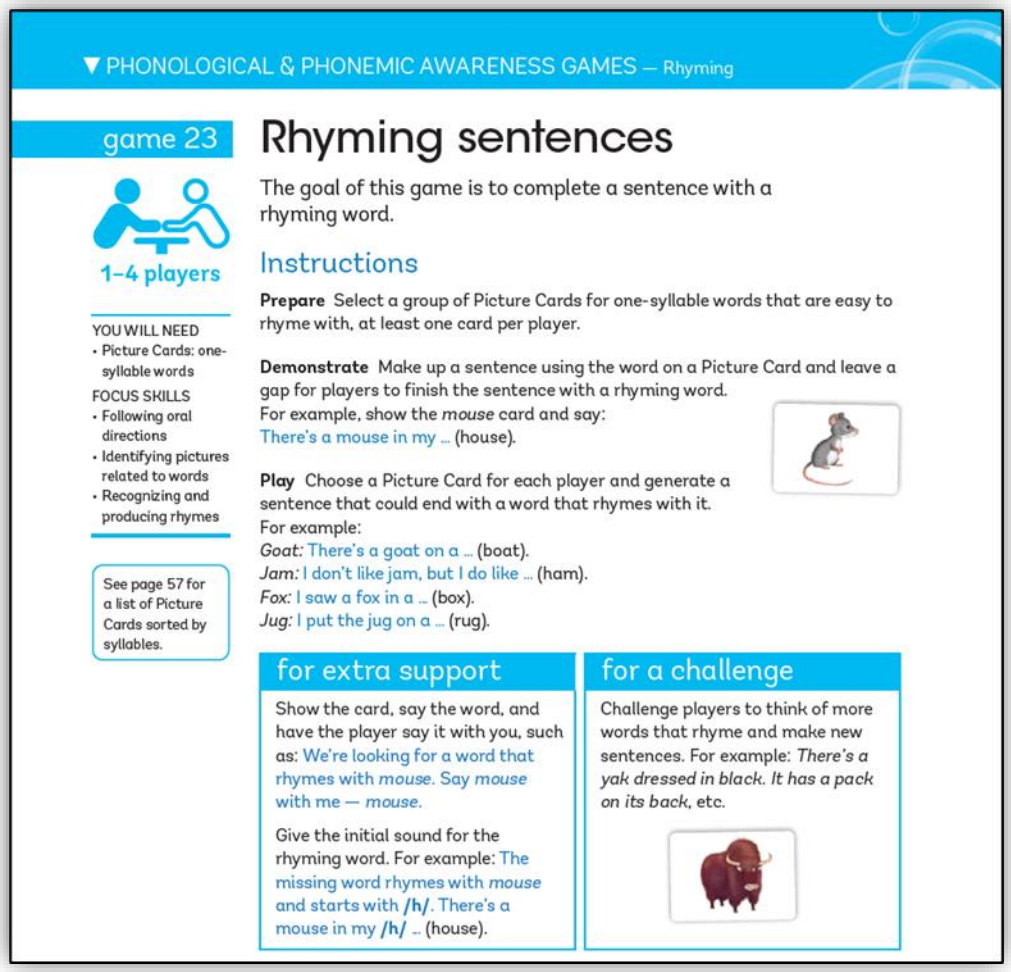
Modifications and Extensions

Offering modifications and extensions to learning activities is an important instructional practice because it supports the principles of differentiated instruction. The approach of differentiated instruction acknowledges that students have varying levels of readiness, interests, and learning profiles, and it aims to provide multiple

pathways for children to achieve success (Tomlinson & Allan, 2000). Ultimately, differentiation positively impacts student learning outcomes (Tomlinson et al., 2003).

Differentiated instruction can involve both modifications and extensions. Modifications are intended to support children who need practice and support in more fundamental skills. Offering modifications, such as alternative assignments, additional resources, or adjusted expectations, can maximize children's potential for success. Therefore, each Key Foundations lesson provides tips for modifying activities for children who need additional support or scaffolding.

Extensions are intended to support children who are more advanced in their learning to delve deeper into a topic or explore related concepts in greater depth. By offering extensions, teachers can scaffold students' learning experiences and facilitate their progression toward more complex skills and concepts. According to Vygotsky's zone of proximal development theory, students learn best when they are provided with tasks that are just beyond their current level of proficiency but achievable with guidance (Vygotsky, 1978). Moreover, providing enrichment activities and opportunities for students to pursue their interests results in increased motivation and academic achievement (Tomlinson et al., 2002). Given the benefits of extension opportunities, Key Foundations lessons provide extensions, including tips for extending or increasing the complexity of the activity for children who need more of a challenge. Finally, lessons include follow-up small-group activities that support additional reinforcement, application, and practice of target skills.



▼ PHONOLOGICAL & PHONEMIC AWARENESS GAMES — Rhyming

game 23

Rhyming sentences

The goal of this game is to complete a sentence with a rhyming word.

1–4 players

YOU WILL NEED
- Picture Cards: one-syllable words

FOCUS SKILLS
- Following oral directions
- Identifying pictures related to words
- Recognizing and producing rhymes

See page 57 for a list of Picture Cards sorted by syllables.

Instructions

Prepare Select a group of Picture Cards for one-syllable words that are easy to rhyme with, at least one card per player.

Demonstrate Make up a sentence using the word on a Picture Card and leave a gap for players to finish the sentence with a rhyming word.
For example, show the *mouse* card and say:
There's a mouse in my ... (house).

Play Choose a Picture Card for each player and generate a sentence that could end with a word that rhymes with it.
For example:
Goat: There's a goat on a ... (boat).
Jam: I don't like jam, but I do like ... (ham).
Fox: I saw a fox in a ... (box).
Jug: I put the jug on a ... (rug).

for extra support

Show the card, say the word, and have the player say it with you, such as: We're looking for a word that rhymes with *mouse*. Say *mouse* with me — *mouse*.

Give the initial sound for the rhyming word. For example: The missing word rhymes with *mouse* and starts with **/h/**. There's a mouse in my **/h/** ... (house).

for a challenge

Challenge players to think of more words that rhyme and make new sentences. For example: *There's a yak dressed in black. It has a pack on its back*, etc.

Teachers can modify the Phonological & Phonemic Awareness Game by using the tip provided in the "For Extra Support" box and can extend the game by implementing the "For a Challenge" tip.

Assessment and Progress Monitoring

Evaluation within education is immensely valuable, fulfilling several crucial roles in bolstering student learning, directing teaching strategies, and appraising educational efficacy. Progress monitoring, a form of assessment, entails continuously monitoring and assessing a student's advancement to furnish educators with feedback. Research suggests that this approach is beneficial in evaluating proficiency across diverse academic domains and assisting educators in elevating their students' academic performance (Fuchs & Fuchs, 2001). Key Foundations provides two pathways for educators to collect data about their children's progress and concept mastery.

One pathway is through observations teachers make during Key Foundations activities. Children are active participants in Key Foundations lessons, and through their participation, teachers can collect ongoing data and provide feedback on children's knowledge and understanding. How children engage during lessons informs teachers about which skills children have mastered and which may need extra attention. Teachers can then use this information to provide extra support during Key Foundations lessons to children who require more fundamental practice.

The other pathway is through reliable and valid assessments provided within the Key Foundations curricular materials that educators can use to identify individual strengths or areas where children need support. The National Early Literacy Panel (2008) indicates that "early childhood educators interested in monitoring children's progress or in identifying those children who need targeted intervention to promote early literacy skills should use assessments that provide reliable and valid measurement of these skills" (p. 78). Key Foundations provides four assessment tools that educators can use to measure early literacy skills and identify children who need additional intervention. Teachers can utilize the data gathered from their observations and one-on-one assessments to compile information about children's knowledge and understanding and evaluate the effectiveness of their instructional methods.

Assessment name	Assessment description
Development Skills Checklist	Assesses children's developmental skills, such as sensory-motor development, cognitive development, and skills related to language and literacy development
Foundations for Literacy Checklist	Assesses the skills children need for learning to read and write, including oral language skills, phonological and phonemic awareness, book and print knowledge, and letter and letter–sound knowledge
Grapheme Knowledge Assessment	Assesses whether children can name and give the appropriate sound for alphabet letters
Letter Formation Assessment	Assesses whether children can write each letter of the alphabet with correct letter formation

Effective PD has been shown to improve educators' use of evidence-based instructional strategies, leading to notable improvements in children's language and literacy skills

(Justice et al., 2008; Powell et al., 2010).

Professional Development to Support Key Foundations Implementation

The Importance of Professional Development

To support educators in using the instructional practices provided through Key Foundations, there are several professional development (PD) opportunities available. High-quality PD is crucial for early childhood educators to enhance their instructional skills and the overall educational experience for young children. Effective PD has been shown to improve educators' use of evidence-based instructional strategies, leading to notable improvements in children's language and literacy skills (Justice et al., 2008; Powell et al., 2010). Additionally, PD supports educators' professional growth and job satisfaction, which contributes to higher staff retention and program stability (Ansley et al., 2019).

Investment in PD is also vital for reducing educational disparities and promoting equitable outcomes among children from diverse backgrounds, particularly children from low-income families or those with special needs. Children attending programs staffed by well-trained educators tend to show better cognitive, social–emotional, and academic outcomes than other children who attended programs where staff did not have as many PD opportunities (Whitebook et al., 2016).

Hatch Early Learning offers specific PD opportunities for Key Foundations, and the Key Foundations instructional materials include embedded PD. These initiatives not only boost educator confidence and community but also foster a more effective and equitable early childhood education system.

Hatch PD Offerings

Hatch's PD opportunities support educators in understanding how to best implement Ignite and Key Foundations in their learning environments and in deepening their educational knowledge overall. The professional learning model of PD at Hatch includes offerings that can be customized for either educators or administrators, which allows programs to tailor the learning to the appropriate audience. Participants also have the benefit of working within a community of their peers and being guided by a trainer to explore deeper into Hatch's solutions. Hatch offers three PD sessions covering everything educators need to know to implement and effectively utilize Ignite and Key Foundations in their programs. These PD sessions focus on how to initiate implementation of these tools, how to utilize the data that these tools produce, and how to incorporate these tools into educators' everyday instructional practices.

Embedded PD in Key Foundations

Key Foundations incorporates embedded PD opportunities, seamlessly integrating them into educators' daily routines. This approach enables educators to apply new knowledge and skills immediately in their teaching practices, enhancing effectiveness and efficiency. Embedded PD in Key Foundations includes specific cues and prompts during activities and lessons, helping educators understand and apply the literacy teaching methodologies more profoundly.

Embedded PD is recognized for its ability to promote reflective practice and continuous professional growth. It allows educators to reflect on their teaching methods in real time, deepening their understanding of educational theories and instructional strategies (Bowman et al., 2001). This ongoing reflection helps educators adapt to the diverse needs of their students, optimizing learning outcomes. Furthermore, embedded PD fosters a collaborative learning environment among teachers, enhancing knowledge sharing and support within the educational community (Sheridan et al., 2009). It also bridges the gap between theory and practice by integrating research-based

strategies directly into classroom interactions, which is crucial for developing key skills, such as language development and social–emotional skills, in young learners (Neuman & Cunningham, 2009). Additionally, because it is integrated into daily routines, embedded PD proves to be a cost-effective and sustainable approach, enhancing long-term educational quality and effectiveness without the need for extensive external training (Hunzicker, 2012).

Hatch's comprehensive approach to PD through both structured PD sessions and embedded strategies within Key Foundations ensures that educators are well-equipped to foster a nurturing and effective learning environment. These PD opportunities not only improve educators' teaching practices but also build a supportive community that emphasizes continuous growth and reflective practice. Ultimately, this commitment to PD helps advance educational equity and excellence, preparing educators to meet the diverse needs of all students and paving the way for children's successful academic and social–emotional development.

Conclusion

Key Foundations is a crucial tool in early childhood education. It builds the foundational skills that support literacy learning and prevents the widening achievement gap that often occurs when some children start school less prepared than their peers. Key Foundations sets children up for success using a comprehensive, evidence-based approach that supports the development of foundational literacy skills. The curriculum is designed for ease of implementation, featuring succinct 10-minute lessons that seamlessly integrate into daily routines, and is backed by robust PD options to ensure that educators are well-prepared and supported. By emphasizing playful, discovery-based learning experiences that engage and respect children's prior knowledge, Key Foundations makes learning not only enjoyable but also deeply effective. Its use of the science of reading to underpin instructional strategies ensures that the approach is grounded in the best practices known to enhance early literacy skills. Most importantly, the speech-to-sound-to-print approach is specifically tailored to set a solid foundation for literacy development, ensuring that young learners are equipped with the critical skills needed to transition successfully into the demands of later schooling. Key Foundations stands out as a pivotal literacy

resource, offering a structured yet flexible approach to bolstering early literacy and preparing children for future academic success.

References

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology*, *103*(1), 1–18. https://psycnet.apa.org/doiLanding?doi=10.1037%2Fa0021017

Ansley, B. M., Houchins, D., & Varjas, K. (2019). Cultivating positive work contexts that promote teacher job satisfaction and retention in high-need schools. *Journal of Special Education Leadership*, *32*(1), 3–16. https://eric.ed.gov/?id=EJ1274904

Bethlehem, R. A. I., Seidlitz, J., White, S. R., Vogel, J. W., Anderson, K. M., Adamson, C., Adler, S., Alexopoulos, G. S., Anagnostou E., Areces-Gonzalez, A., Astle, D. E., Auyeung, B., Ayub, M., Bae, J., Ball, G., Baron-Cohen, S., Beare, R., Bedford, S. A., Benegal, V., . . . Zuo, X. N. (2022). Brain charts for the human lifespan. *Nature*, *604*, 525–533. https://doi.org/10.1038/s41586-022-04554-y

Biemiller, A., & Slonim, N. (2001). Estimating root word vocabulary growth in normative and advantaged populations: Evidence for a common sequence of vocabulary acquisition. *Journal of Educational Psychology*, *93*(3), 498–520. https://psycnet.apa.org/doi/10.1037/0022-0663.93.3.498

Blair, C., & Peters Razza, R. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, *78*(2), 647–663. https://doi.org/10.1111/j.1467-8624.2007.01019.x

Bonawitz, E., Shafto, P., Gweon, H., Goodman, N. D., Spelke, E., & Schulz, L. (2011). The double-edged sword of pedagogy: Instruction limits spontaneous exploration and discovery. *Cognition, 120*(3), 322–330. https://doi.org/10.1016/j.cognition.2010.10.001

Bowman, B. T., Donovan, M. S., & Burns, M. S. (Eds.). (2001). *Eager to learn: Educating our preschoolers*. National Academy Press.

Bustamante, A. S., Hindman, A. H., Champagne, C. R., & Wasik, B. A. (2018). Circle time revisited: How do preschool classrooms use this part of the day? *Elementary School Journal*, *118*(4), 610–631. https://www.journals.uchicago.edu/doi/10.1086/697473

Byrne, B. (2005). Theories of learning to read. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 104–119). Blackwell Publishing Ltd. https://doi.org/10.1002/9780470757642

Byrne, B., & Fielding-Barnsley, R. (1989). Phonemic awareness and letter knowledge in the child's acquisition of the alphabetic principle. *Journal of Educational Psychology*, *81*(3), 313–321. https://doi.org/10.1037/0022-0663.81.3.313

Camilli, G., Vargas, S., Ryan, S., & Barnett, W. S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record*, *112*(3), 579–620. https://doi.org/10.1177/016146811011200303

Caravolas, M., Hulme, C., & Snowling, M. J. (2001). The foundations of spelling ability: Evidence from a 3-year longitudinal study. *Journal of Memory and Language*, *45*(4), 751–774. https://doi.org/10.1006/jmla.2000.2785

Center on the Developing Child. (2007). *InBrief: The science of early childhood development*. Harvard University. https://developingchild.harvard.edu/resources/inbrief-science-of-ecd/

Clark, R. C., & Mayer, R. E. (2024). *e-Learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning* (5th ed.). Wiley.

Clemens, N. H., Hsiao, Y.-Y., Lee, K., Martinez-Lincoln, A., Moore, C., Toste, J., & Simmons, L. (2021). The differential importance of component skills on reading comprehension test performance among struggling adolescent readers. *Journal of Learning Disabilities*, *54*(3), 155–169. https://psycnet.apa.org/doi/10.1037/edu0000814

Dickinson, D. K., McCabe, A., Anastasopoulos, L., Peisner-Feinberg, E. S., & Poe, M. D. (2003). The comprehensive language approach to early literacy: The interrelationships among vocabulary, phonological sensitivity, and print knowledge among preschool-aged children. *Journal of Educational Psychology*, *95*(3), 465–481. https://doi.org/10.1037/0022-0663.95.3.465

Dickinson, D. K., & Porche, M. V. (2011). Relation between language experiences in preschool classrooms and children's kindergarten and fourth-grade language

and reading abilities. *Child Development*, *82*(3), 870–886. https://doi.org/10.1111/j.1467-8624.2011.01576.x

Duke, N. K., Halvorsen, A.-L., & Knight, J. A. (2012). Building knowledge through informational text. In A. M. Pinkham, T. Kaefer, & S. B. Neuman (Eds.), *Knowledge development in early childhood: Sources of learning and classroom implications* (pp. 205–219). Guilford Publications.

Early, D. M., Iruka, I. U., Ritchie, S., Barbarin, O. A., Winn, D.-M. C., Crawford, G. M., Frome, P. M., Clifford, R. M., Burchinal, M., Howes, C., Bryant, D. M., & Pianta, R. C. (2010). How do pre-kindergarteners spend their time? Gender, ethnicity, and income as predictors of experiences in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, *25*(2), 177–193. https://doi.org/10.1016/j.ecresq.2009.10.003

Ehri, L. C. (1991). The development of reading and spelling in children: An overview. In M. Snowling & M. Thomson (Eds.), *Dyslexia: Integrating theory and practice* (pp. 63–79). Whurr Publishers.

Ehri, L. C. (1994). Development of the ability to read words: Update. In R. B. Ruddell, M. R. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 323–358). International Literacy Association.

Ehri, L. C., Nunes, S. R., Willows, D. M., Valeska Schuster, B., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly*, *36*(3), 250–287. https://doi.org/10.1598/RRQ.36.3.2

Fisher, K. R., Hirsh-Pasek, K., Newcombe, N., & Golinkoff, R. M. (2013). Taking shape: Supporting preschoolers' acquisition of geometric knowledge through guided play. *Child Development*, *84*(6), 1872–1878. https://doi.org/10.1111/cdev.12091

Foorman, B. R., Petscher, Y., & Herrera, S. (2018). Unique and common effects of decoding and language factors in predicting reading comprehension in grades 1–10. *Learning Disabilities Research & Practice*, *30*(2), 12–23. https://doi.org/10.1016/j.lindif.2018.02.011

Fuchs, L. S., & Fuchs, D. (2001). *What is scientifically-based research on progress monitoring?* U.S. Office of Special Education Programs, National Center on Student Progress Monitoring. https://files.eric.ed.gov/fulltext/ED502460.pdf

Han, M., Moore, N., Vukelich, C., & Buell, M. (2010). Does play make a difference? How play intervention affects the vocabulary learning of at-risk preschoolers. *American Journal of Play*, *3*(1), 82–105. https://files.eric.ed.gov/fulltext/EJ1070222.pdf

Hirsh-Pasek, K., Golinkoff, R. M., Berk, L. E., & Singer, D. (2009). *A mandate for playful learning in preschool: Presenting the evidence*. Oxford University Press.

Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting education in "educational" apps: Lessons from the science of learning. *Psychological Science in the Public Interest*, *16*(1), 3–34. https://doi.org/10.1177/1529100615569721

Hoffman, J. L., & Cassano, C. (2012). The beginning: Reading with babies and toddlers. *So much more than ABCs: The early phases of reading and writing.* National Association for the Education of Young Children.

Hopkins, E. J., Spiewak Toub, T., Hassinger-Das, B., Golinkoff, R. M., & Hirsh-Pasek, K. (2019). Playing for the future: Redefining early childhood education. In D. Whitebread, V. Grau, K. Kumpulainen, M. McClelland, N. Perry, & D. Pino-Pasternak (Eds.) *The SAGE Handbook of developmental psychology and early childhood education* (pp. 239–256). Sage.

Huang, F. L., Tortorelli, L. S., & Invernizzi, M. A. (2014). An investigation of factors associated with letter–sound knowledge at kindergarten entry. *Early Childhood Research Quarterly*, *29*(2), 182–192. https://doi.org/10.1016/j.ecresq.2014.02.001

Hunzicker, J. (2012). Professional development and job-embedded collaboration: How teachers learn to exercise leadership. *Professional Development in Education*, *38*(2), 267–289. https://doi.org/10.1080/19415257.2012.657870

Justice, L. M., Mashburn, A. J., Hamre, B. K., & Pianta, R. C. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk pupils. *Early Childhood Research Quarterly, 23*(1), 51–68. https://doi.org/10.1016/j.ecresq.2007.09.004

Kamil, M. L., Pearson, P. D., Birr Moje, E., & Afflerbach, P. (Eds.). (2011). *Handbook of reading research, volume IV*. Routledge.

Lefebvre, P., Trudeau, N., & Sutton, A. (2011). Enhancing vocabulary, print awareness and phonological awareness through shared storybook reading with low-income preschoolers. *Journal of Early Childhood Literacy*, *11*(4), 453–479. https://doi.org/10.1177/1468798411416581

Lillard, A., & Else-Quest, N. (2006). Evaluating Montessori education. *Science*, *313*(5795), 1893–1894. https://doi.org/10.1126/science.1132362

Lin, Z. (2022, October 16). How long is a child's attention span? (You may be surprised!). *Curious Neuron*. https://www.curiousneuron.com/blog/2022/10/16/how-long-is-a-childs-attention-span-you-may-be-surprised

Lonigan, C. J., & Shanahan, T. (2009). *Developing early literacy: Report of the National Early Literacy Panel* (Executive summary]. National Institute for Literacy. https://lincs.ed.gov/publications/pdf/NELPSummary.pdf

Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning? *American Psychologist*, *59*(1), 14–19. https://doi.org/10.1037/0003-066X.59.1.14

Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: Evidence from a longitudinal study. *Developmental Psychology*, *40*(5), 665–681. https://doi.org/10.1037/0012-1649.40.5.665

National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. National Institute for Literacy. https://www.nichd.nih.gov/sites/default/files/publications/pubs/documents/NELPReport09.pdf

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

https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf

Neuman, S. B., & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *American Educational Research Journal*, *46*(2), 532–566. https://doi.org/10.3102/0002831208328088

Neuman, S. B., Kaefer, T., & Pinkham, A. (2022). Incidental word learning through multiple media: A case for synergy. *Topics in Language Disorders*, *42*(4), 290–303. https://doi.org/10.1097/TLD.0000000000000293

Neuman, S. B., Samudra, P., & Wong, K. M. (2021). Two may be better than one: Promoting incidental word learning through multiple media. *Journal of Applied Developmental Psychology, 73*, 101252. https://doi.org/10.1016/j.appdev.2021.101252

Pace, A., Alper, R., Burchinal, M. R., Golinkoff, R. M., & Hirsh-Pasek, K. (2019). Measuring success: Within and cross-domain predictors of academic and social trajectories in elementary school. *Early Childhood Research Quarterly*, *46*, 112–125. https://doi.org/10.1016/j.ecresq.2018.04.001

Piaget, J. (1968). *Six psychological studies*. Vintage Books.

Powell, D. R., Diamond, K. E., Burchinal, M. R., & Koehler, M. J. (2010). Effects of an early literacy professional development intervention on Head Start teachers and children. *Journal of Educational Psychology*, *108*(2), 229–245. https://doi.org/10.1037/a0017763

Roskos, K. A., & Christie, J. F. (2013). Gaining ground in understanding the play-literacy relationship. *American Journal of Play*, *6*(1), 82–97. https://www.proquest.com/docview/1470086311

Saracho, O. (2012). Creativity theories and related teachers' beliefs. *Early Child Development and Care*, *182*(1), 35–44. https://doi.org/10.1080/03004430.2010.535899

Shen, Z., Popov, V., Delahay, A. B., & Reder, L. M. (2017). Item strength affects working memory capacity. *Memory & Cognition*, *46*, 204–215. https://doi.org/10.3758/s13421-017-0758-4

Sheridan, S. M., Edwards, C. P., Marvin, C. A., & Knoche, L. L. (2009). Professional development in early childhood programs: Process issues and research needs. *Early Education and Development*, *20*(3), 377–401. https://doi.org/10.1080/10409280802582795

Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, *4*(6), 592–604. https://doi.org/10.1037/0278-7393.4.6.592

Smith, R., Snow, P., Serry, T., & Hammond, L. (2021). The role of background knowledge in reading comprehension: A critical review. *Reading Psychology*, *42*(3), 214–240. https://doi.org/10.1080/02702711.2021.1888348

Stanovich, K. E., Nathan, R. G., & Vala-Rossi, M. (1986). Developmental changes in the cognitive correlates of reading ability and the developmental lag hypothesis. *Reading Research Quarterly*, *21*(3), 267–283. https://doi.org/10.2307/747709

Tare, M., Chiong, C., Ganea, P., & DeLoache, J. (2010). Less is more: How manipulative features affect children's learning from picture books. *Journal of Applied Developmental Psychology*, *31*(5), 395–400. https://doi.org/10.1016/j.appdev.2010.06.005

Tomlinson, C. A., & Allan, S. D. (2000). *Leadership for differentiating schools and classrooms*. Association for Supervision and Curriculum Development.

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., Conover, L. A., & Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of literature. *Journal for the Education of the Gifted*, *27*(2-3), 119–145. https://doi.org/10.1177/016235320302700203

Tomlinson, C. A., Kaplan, S. N., Renzulli, J. S., Purcell, J., Leppien, J., & Burns, D. (2002). *The parallel curriculum: A design to develop high potential and challenge high-ability learners* (1st ed.). Corwin Press.

Treiman, R. (1991). Phonological awareness and its roles in learning to read and spell. In D. J. Sawyer & B. J. Fox (Eds.), *Phonological awareness in reading: The evolution of current perspectives* (pp. 159–189). Springer. https://doi.org/10.1007/978-1-4612-3010-6_6

Treiman, R. (2018). Teaching and learning spelling. *Child Development Perspectives*, *12*(4), 235–239. https://doi.org/10.1111/cdep.12292

van de Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher–student interaction: A decade of research. *Educational Psychology Review*, *22*, 271–296. https://doi.org/10.1007/s10648-010-9127-6

Van Oers, B., & Duijkers, D. (2013). Teaching in a play-based curriculum: Theory, practice and evidence of developmental education for young children. *Journal of Curriculum Studies*, *45*(4), 511–534. https://doi.org/10.1080/00220272.2011.637182

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Walsh, G., Sproule, L., McGuinness, C., Trew, K., Rafferty, H., & Sheehy, N. (2006). An appropriate curriculum for 4–5-year-old children in Northern Ireland: Comparing play-based and formal approaches. *Early Years*, *26*(2), 201–221. https://doi.org/10.1080/09575140600760003

Weisberg, D. S., Hirsh-Pasek, K., & Golinkoff, R. M. (2013). Guided play: Where curricular goals meet a playful pedagogy. *Mind, Brain, and Education*, *7*(2), 104–112. https://doi.org/10.1111/mbe.12015

Whitebook, M., McLean, C., & Austin, L. J. E. (2016). *Early childhood workforce index 2016*. University of California, Berkeley, Center for the Study of Child Care Employment. https://cscce.berkeley.edu/wp-content/uploads/2022/04/Early-Childhood-Workforce-Index-2016.pdf

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *The Journal of Child Psychology and Psychiatry*, *17*(2), 89–100. https://doi.org/10.1111/j.1469-7610.1976.tb00381.x

Yates, G., & Chandler, M. (1994). Prior knowledge and how it influences classroom learning. What does the research tell us? *Set: Research Information for Teachers*, *2*. https://doi.org/10.18296/set.0958

Zosh, J. M., Gaudreau, C., Golinkoff, R. M., & Hirsh-Pasek, K. (2022). The power of playful learning in the early childhood setting. *Young Children*, *77*(2), 6–13.

Zosh, J. M., Hirsh-Pasek, K., Hopkins, E. J., Jensen, H., Liu, C., Neale, D., Solis, S. L., & Whitebread, D. (2018). Accessing the inaccessible: Redefining play as a spectrum. *Frontiers in Psychology*, *9*, Article 1124. https://doi.org/10.3389/fpsyg.2018.01124