



Contact us

LeapFrog Enterprises, Inc. 2200 Powell Street, Suite 500 Emeryville, CA 94608 www.leapfrog.com

Every Day is a New Chapter in the LeapFrog Reading Journey™

About the Author

Carolyn Jaynes, PhD is Senior Manager for Learning & Curriculum of the Learning Team at LeapFrog Enterprises, Inc. As the literacy development expert on the team, she ensures that the curricular design in LeapFrog products is grounded in the latest educational research. Before joining LeapFrog, Dr. Jaynes was a reading professor at Sacramento State University, a curriculum developer for the Lawrence Hall of Science in Berkeley, and a teacher in the San Francisco Bay Area. She earned her doctorate in educational psychology at Michigan State University.

LeapFrog Enterprises, Inc. is the leader in innovative solutions that encourage a child's curiosity and love of learning throughout their early developmental journey. LeapFrog products combine educational expertise led by the LeapFrog Learning Team, innovative technology, and engaging play to help children expand their knowledge and imagination – turning playtime into quality time that helps children leap ahead. LeapFrog, a member of VTech Group, is based in Emeryville, California.

For more information, visit www.leapfrog.com

Table of Contents

From the Very Start, Your Child's Reading Journey is Unfolding	Executive Summary	3
Playful Learning: The Heart of LeapFrog	From the Very Start, Your Child's Reading Journey is Unfolding	5
The Path to Reading	LeapFrog's Commitment to Research-Based Learning Design	7
The LeapFrog Reading Journey	Playful Learning: The Heart of LeapFrog	9
Infusing Play with Learning: Curriculum, Content, and Context 2 As Science Evolves, So Do Our Products	The Path to Reading	13
As Science Evolves, So Do Our Products	The LeapFrog Reading Journey	17
	Infusing Play with Learning: Curriculum, Content, and Context	2
References 3	As Science Evolves, So Do Our Products	3!
	References	37



@2024 LeapFrog Enterprises, Inc.

Executive Summary

Every Day is a New Chapter in the LeapFrog Reading Journey™

This white paper introduces the LeapFrog Reading Journey and illustrates how it complements our focus on three synergistic goals—helping children learn to read, love to read, and read to learn.

From the Very Start, Your Child's Reading Journey is Unfolding

In the first section, we introduce a model of reading that aligns with our goals of helping children learn to read, love to read, and read to learn, and make the case that long before children learn about letters and how to decode text, they benefit from a range of oral language experiences that will serve them on their lifelong reading journey.

LeapFrog's Commitment to Research-Based Learning Design

Next, we consider LeapFrog's learn-to-read heritage with an ongoing product portfolio that supports a range of reading skills and processes across ages and stages. We discuss recent media coverage of children's reading achievement in the United States and underscore our commitment to the cause of ever-improving literacy achievement for all children through the design of playful learning experiences that align with scientific findings.

Playful Learning: The Heart of LeapFrog

This section explores how toys, books, and games enhanced with technology features can facilitate active learning opportunities within the context of play. We illustrate where selected toys and electronic devices fall on the continuum of play-based learning—from free play to learning through games.

The Path to Reading

Next, we outline how LeapFrog approaches reading with play-based learning. We open with a definition of reading as making meaning from print through the coordination of many overlapping skills, processes, and dispositions—many of which are identified in our six pillars of reading:

- Phonological Awareness
- Alphabet and Print Knowledge
- · Phonics and Word Recognition
- Vocabulary and Oral Language Development
- · Comprehension and Knowledge
- Fluency



The LeapFrog Reading Journey

Knowing that children do not develop these skills, processes and dispositions all at once, we take the next section to outline the LeapFrog Reading Journey that maps reading-related skills onto four stages—Sound Babblers, Word Explorers, Letter Learners, and Book Readers.

Infusing Play with Learning

This section highlights our emphasis on design that prompts children's active engagement in play infused with learning, attending to three elements of the playful learning experience: curriculum, content, and context. With examples from our LeapFrog Reading Journey Collection, we illustrate how audio and visual cues, inputs, rewards, and supports not only delight, instruct, scaffold, and provide immediate feedback, but they also allow for independent learning opportunities that support the curricular objectives even when an adult is not available. Knowing that context is another critical factor that influences playful learning experiences, we provide examples of how we intentionally design our products to be used in different ways that the child can choose at any time.



As Science Evolves, So Do Our Products

The LeapFrog Reading Journey provides a framework that guides the design of our reading products and is grounded in findings from decades of research. That said, we bear in mind that the fields of science that contribute to our understanding of how children learn to read are continually evolving; and as these fields evolve, the LeapFrog Reading Journey will as well. We know that partnering with families is a privilege based on trust that we stay abreast of reading-related research so we can continue to provide a portfolio of products and parent resources that will support children's reading development as they go about their work of play.

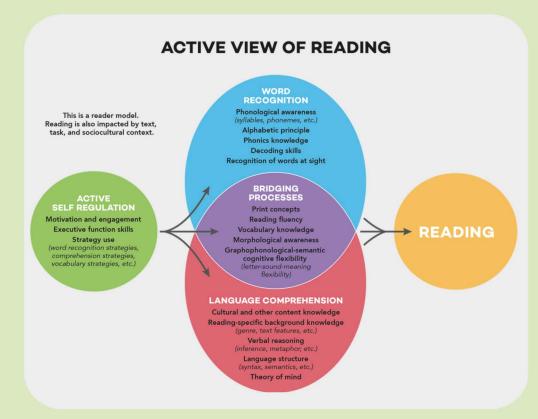
From the Very Start, Your Child's Reading Journey is Unfolding

From day one, babies are learning to recognize the sounds of language (1). At LeapFrog, our mission is to partner with parents on their children's learn-to-read journey that begins at birth. Knowing that babies are learning to recognize and imitate language sounds and structures from the very beginning, we avoid terms like "pre-reader" and "non-reader," because we know that the sounds and babbles in the first year reflect important first steps on a lifelong reading journey (2).

We keep our focus on three synergistic goals: helping children learn to read, love to read, and read to learn. And we believe reading—and learning to read—is fun. That's why we keep our focus on three synergistic goals: helping children learn to read, love to read, and read to learn. It's important that new readers build confidence with foundational skills such as phonics and listening comprehension. Doing so through childcentered, playful experiences helps little ones associate reading with something that is truly enjoyable and allows them to learn about their passions and interests.

With this in mind, we subscribe to a model of reading that includes skills related to phonics, word recognition and comprehension as well as factors related to motivation, engagement, and executive function skills that begin to develop in baby's first moments. Researchers Nell Duke and Kelly Cartwright outline the many related elements of reading in a model called the Active View of Reading (3). The model includes the essential skills related to word recognition and comprehension and identifies certain skills, processes, and dispositions that influence both.

Figure 1. Duke & Cartwright's (2021) Active View of Reading



Note. Several wordings in this model are adapted from Scarborough (2001) (4).

Our Commitment to Research-Based Learning Design

In 1995, LeapFrog's founder, Mike Wood, was concerned about his son's reading development and set out to develop a product that would help him map sounds to the letters that represent those sounds. He consulted with learning experts and researchers from the Stanford Graduate School of Education to design the Phonics Desk™, an electronic learning toy that announces phonemes, or letter sounds, when letter buttons are pressed, helping children match letters to their most common sounds (5). Since then, LeapFrog has built its legacy on supporting children's reading journeys with a research-based product portfolio to support a broad range of reading skills and processes across ages and stages.



With this heritage in mind, we are especially cognizant of the recent media alarms around the state of children's reading achievement in the United States. While some concerns relate to learning losses attributed to conditions during the COVID-19 pandemic, others center around differing perspectives on how to teach reading (6, 7). For decades, the term "reading wars" has referred to disagreements over how to teach children to read. That said, the opposing "sides" in these alleged wars are moving targets and are often understood differently by the very researchers, policymakers, and educators engaging in the debates.

At LeapFrog we believe that, ultimately, the back-and-forth arguments, along with the confusing and often heated rhetoric, are not helpful to children and families. A more nuanced view is necessary, and LeapFrog chooses to embrace a perspective that brings together multiple disciplines of research. Determining just how to provide the most beneficial learn-to-read experiences requires a firm grasp on the most up-to-date findings from the existing and growing bodies of research on reading development and instruction.



Therefore, we focus on staying abreast of a broad range of research within the fields of neuroscience, cognitive development, literacy education, and educational psychology—among others—and design playful learning experiences informed by these scientific findings.

At LeapFrog, we are committed to the cause of ever-improving literacy achievement for all children. We honor this commitment by continually innovating to provide better and more varied learn-to-read experiences to benefit children with different needs, backgrounds, and learning contexts.

8

Playful Learning: The Heart of LeapFrog

Play involves activity that a child is motivated to do for the purposes of enjoyment, exploration, creation, and/or joyful discovery, rather than fulfilling unrelated external goals. Play is often spontaneous and involves active engagement, which may include elements of make-believe, while helping to build executive function skills (8). At LeapFrog, we know that play can also provide fertile ground for learning, which is why we design products and experiences where play and learning are intricately linked. Toys are objects for play, whether a stack of nesting cups that kids can explore freely, a pretend phone that encourages imaginative dialogue, or a digital tablet with games that build problem-solving skills. And today, toys, books, and games enhanced with electronics or technology features can provide instruction, prompts, and feedback to facilitate active learning opportunities within the context of play (9). To illustrate how some toys and electronic devices can support playful learning, we will refer to a continuum created by researchers Angela Pyle and Erica Danniels that includes five categories of play-based learning (10). Each category describes a type of play, with distinctions based on the extent to which adults or children are determining the learning goals and directing the experience. We use this continuum to illustrate how products with audio and visual elements that provide instruction, prompts, and feedback can integrate play and learning in ways that allow the products to be slotted into these play-based learning categories. While toys at the latter part of the continuum are more instructive in nature, we are not suggesting that any toy or device could ever compare to a child's caregivers or teachers. Certainly, best pedagogical practices should inform the industry's design of play and learning to provide experiences that can complement a child's other learn-to-read experiences. Table 1 provides a brief description of each playbased learning category with example products that fit along the continuum.



Table 1. Continuum of Play-Based Learning Adapted from Pyle & Danniels, (2017)

Free Play

The child determines what to play with and directs their own

Inquiry Play

The child initiates the play and asks questions based on their interests. Prompts and questions encourage the child to extend the play and exploration.

Collaborative Play

The learning outcomes are determined for the child, but the context for the play is based on the child's interests and passions.

Playful Learning

Learning outcomes and context are determined for the child. Learning is designed to be both playful and engaging.

Learning Through Games

Learning outcomes and context are determined for the child. Learning takes place within the form of a game.

Examples:

play narratives.

- · Stacking wooden blocks
- Playing with dinosaurs or cars
- · Sand and water play

Examples:

- Exploring simple machines
- Simple science experiments
- Making a "xylophone" with water-filled cups

Examples:

- Measuring in a play kitchen
- Making change in a play grocery store
- Making tickets for a pretend carnival

Examples:

- Play food truck with menus
- Scavenger hunts for items that start with certain letter sounds
- Finding examples of triangles in the world

Examples:

- Playing sight word bingo
- Using magnetic fishing poles to "fish" for certain letters
- Playing Go Fish with number cards



With Fisher-Price's *Baby's First Blocks Set, Shape-Sorting Toy™*, children choose which colored shapes to explore as they stack, sort, or engage in other free play.



With Melissa & Doug's Let's Explore Binoculars & Compass Play Set™, children are encouraged to investigate their own interests in the world around them using play binoculars.



With VTech's Chomp & Count Dino™, children with a passion for dinosaurs learn about colors, foods, shapes and counting as they feed a silly dino friend.



LeapFrog's LeapStart®
Get Ready for Reading 4Pack Book Set includes
more than 50 playful
learning activities including
hunting for objects that
have different numbers of
syllables.



With ThinkFun's Zingo Bingo™, children build word recognition and vocabulary skills as they match words and images playing bingo with friends and family.

The Path to Reading

Play is inherently valuable to overall development and educational toys can be especially beneficial in the pursuit of meeting specific learning goals, including learning to read. Before we outline how LeapFrog infuses play with learn-to-read opportunities, it is important to clarify what we mean by "reading." We define reading as making meaning from print through the coordination of many overlapping skills, processes, and dispositions. Some of these essential skills and processes are outlined in the 2000 report from the National Reading Panel that underscores the importance of phonemic awareness, phonics, fluency, vocabulary, and comprehension (11).

Building from this list, LeapFrog identifies six pillars of reading. While the Active View of Reading presented in the first section represents how the various elements of reading interact, this section uses a six-pillar metaphor to describe these elements in greater detail.

The first pillar is **phonological awareness** which includes phonemic awareness, or the ability to recognize and manipulate individual sounds in words. Phonological awareness also includes the ability to detect and complete rhymes, count syllables, and blend onsets (d-) and rimes (-og) into words (dog).

A second pillar is alphabet and print knowledge which involves awareness of the alphabetic principle, or knowing the alphabet and understanding that letters represent sounds. It also includes understanding concepts about how books and print work.

The third pillar is all about phonics and word recognition which entails mapping the 44 sounds of the English language onto the letters and letter combinations that represent those sounds in order to read (decode) and spell (encode) words, as well as recognizing words automatically, on sight. In this pillar we also include learning to write letters and spell words as children build their knowledge of sound-spelling relationships.

A fourth pillar is related to **vocabulary** and oral language development which includes not only knowing the meanings of words, but also understanding English syntax, morphology, and pragmatics, or recognizing the effects of language choices in different contexts.

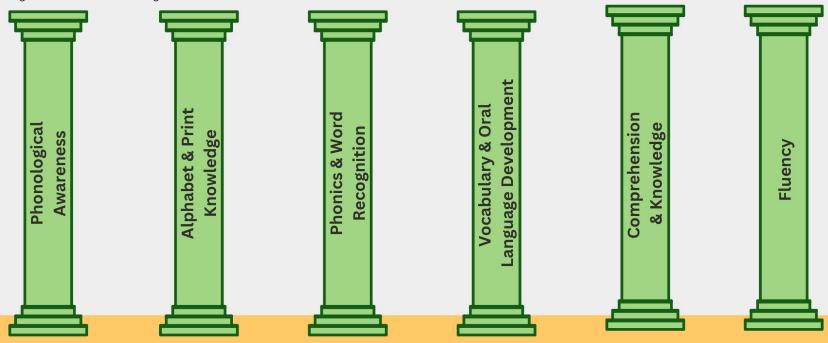
The fifth pillar we call **comprehension** and knowledge which includes listening and reading comprehension while using background knowledge, cultural understanding, prior experience, and awareness of text and narrative structure to make meaning from print and to express one's own ideas and stories.

Lastly, the sixth pillar of **fluency** refers to a child's ability to read a text quickly, accurately, and with proper expression, allowing for more of the cognitive load to focus on constructing meaning than on decoding individual words.



Play is inherently valuable to overall development, and educational toys can be especially beneficial in the pursuit of meeting specific learning goals, including learning to read.

Figure 2. Pillars of Reading



strategies for figuring out words, making inferences, executive function skills, verbal reasoning skills, motivation, relevance

Along with these six pillars, LeapFrog's definition of reading includes additional skills, processes, and dispositions that contribute to a child's ability to make meaning from print. First, a child's ability to identify and use effective strategies for identifying unfamiliar words, monitoring their understanding of a text, generating inferences, or determining meanings of new words has a profound impact on comprehension the ultimate goal of reading (12). In addition to strategy use, a child's executive function skills, including cognitive flexibility and working memory, along with verbal reasoning skills, play an important role in making meaning from print (13, 14).

Finally, a reader's motivation and the relevance a child finds in the act of reading are key factors in the reading process. Research suggests that valuing reading, having a choice of reading material that matches personal interests, and enjoying time with books being read aloud have the power to enhance motivation to read and contribute to a sense of meaning in the reading experience (15, 16, 17). In the Active View of Reading model, to which LeapFrog subscribes, these elements related to motivation, executive functioning, and strategy use contribute to active self-regulation that influences both word recognition and language comprehension skills.

It is important to note that children do not develop these skills, processes, and dispositions all at once. Rather, research shows that they are learned and built upon through a cumulative process. From birth to age 9, children are laying a foundation for becoming a fluent reader (18). LeapFrog's reading curriculum focuses on the early stages of this process and is reflected in what we refer to as The LeapFrog Reading Journey™. This journey, outlined in the section that follows, maps these reading-related skills, processes, and dispositions onto four stages-Sound Babblers, Word Explorers, Letter Learners, and Book Readers.



The LeapFrog Reading Journey

Becoming a reader is a journey that begins at birth. The LeapFrog Reading Journey maps the reading-related skills and processes outlined earlier onto four stages: Sound Babblers, Word Explorers, Letter Learners, and Book Readers.

The stage descriptions that follow outline the foundational skills related to phonics, word recognition, and comprehension that help build confident readers. That said, it is important to keep in mind the additional skills, processes, and dispositions noted earlier that are related to motivation, context, reasoning and executive function skills, as they, too, play critical roles in the learn-to-read process. It is important to note that children develop at their own pace, so the stages have overlapping ages that are meant to serve as general guidelines rather than set developmental timelines.

Figure 3. The Four Stages of the LeapFrog Reading Journey

Sound Babblers O year to 1 year



- Becoming aware of oral language sounds and patterns
- Imitating sounds
- · Pointing and nodding
- Starting to say some words

Word Explorers 1 year to 3 years



- Using new words every day
- · Learning how to turn pages
- · Noticing words and pictures
- Singing the ABC song

Letter Learners 2 years to 5 years



- Learning letters and sounds
- Appreciating rhyme and alliteration
- Noticing words that have the same sounds

Book Readers 4 years to 7 years



- Knowing the common sounds for all 26 letters
- Begining to read (decode) some words using phonics knowledge
- Beginning to spell (encode) some words using phonics knowledge

Stage 1: **Sound Babblers**

In this stage, before children utter their first words, they are hearing and imitating the sounds of oral language as they babble away. In fact, it takes most infants less than one year to learn the full inventory of sounds in their home language (19). There are 44 sounds in the English language, and children hear and produce these sounds long before they can match them to the different letters and spellings used to represent them—a system we refer to as phonics. In year one, immersing children in oral language by talking with them, reading books, and enjoying songs with rhythm and rhyme lays a foundation that is critical for future reading success.

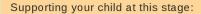






Sound Babblers in Action

Sound Babblers may communicate with pointing, nodding, shaking their heads, and grunting before they utter their first words. They demonstrate understanding when they point to pictures or wave to a loved one when prompted. Even before they can speak sentences, children are absorbing their home language through these activities.



- · Reading books with your baby
- Engaging in simple oral language exchanges, like peek-a-boo
- · Listening to songs with rhyme and alliteration to familiarize your baby with words that share speech sounds
- Sharing nursery rhymes to help your baby tune in to the rhythms of oral language
- · Prompting your baby to point to named objects or pictures



Stage 2: Word Explorers

Moving into their second year, children begin to replace babbles with words and build vocabulary at a very fast rate (20). At ages 2 and 3, children may start to recognize that there is a connection between the words on the pages of a book and the words that are spoken aloud (21).

Supporting your child at this stage:

- Talking with your toddler, inviting them to respond with their own oral language
- Singing songs and reading books with repeated language patterns
- Singing the ABC song and playing ABC games
- Reading to your child as often as possible









Word Explorers in Action

Word Explorers enjoy chants and songs with rhymes and repeated phrases, which foster their oral language development. Eventually, they start using their growing vocabulary and understanding of how sentences are formed to express their own ideas and thoughts in simple sentences.

During this time, children spend lots of time exploring books and songs about the ABCs. As they listen to books read aloud, toddlers begin to recognize that there is a connection between those marks—or words—on the page and the words that are spoken. Many children enjoy pretending to read on their own and retelling simple, familiar stories. As they sing alphabet songs, toddlers begin to learn the full inventory of letters in the English language, in alphabetical order, and may even name some letters by sight, often starting with the letters in their name.

Stage 3: Letter Learners

At ages 3 and 4, children begin to recognize the letters of the English alphabet and understand that they represent the sounds of language. This is referred to as the alphabetic principle (22). When children hear sounds and are asked to blend them together, they build an essential understanding that words are made up of individual sounds—the same sounds that infused their babbles in year one (23).

Supporting your child at this stage:

- Playing games and doing puzzles with letter names, letter shapes, and letter sounds
- Encouraging your child to think about and make the sounds of the letters as they are learning to write
- Playing guess-the-word games that prompt your child to blend sounds into words, moving from larger word units with compound words to blending individual phonemes:

Guess the word... pan...cake...
Guess the word... sp...oon...
Guess the word... mmm...ooo...nnn...



Letter Learners in Action

Letter Learners are busy developing phonemic awareness and basic phonics skills, such as beginning to match letters to the sounds they most often represent. That is, they start by learning that the letter A represents the short-A sound as in apple and will later move on to understand that A can also represent the long-A sound in cake and the schwa sound at the beginning of amazing. At the same time, they are learning how words are made up of individual sounds. The emphasis on these important building blocks helps to prepare preschoolers for more explicit phonics learning when they enter elementary school.

Stage 4: Book Readers

At ages 4 and 5, children learn to match all 26 letters to their most common sounds. And at ages 5 and 6, they begin to map all 44 English language sounds to a broader range of letters and letter combinations, such as sh and ay, that represent different sounds. They learn that the individual sounds in words can be taken apart and put together in new ways to make new words as they begin to read and spell words on their own (24).





Supporting your child at this stage:

- Providing your child with opportunities to read books with words that use the sound-spelling relationships they know
- Encouraging your child to write and spell words that use the sound-spelling relationships they know
- Playing sight word games
- Continuing to read books to your child that include more advanced vocabulary and spelling patterns



Book Readers in Action

Book Readers are at the phase of development where they are learning to read and spell words independently. As they begin to blend individual sounds into words, Book Readers may notice that some words are spelled in similar ways. They can apply what they know about one word to decode or spell a new word. In addition, they are recognizing many words by sight, some of which have some uncommon spelling patterns—words like the, where, and does.

The fourth LeapFrog Reading Journey stage—when children begin to read and spell words independently—is an exciting step along a child's reading journey that begins at birth and includes many more skills and processes than we list in these brief stage descriptions. While these fundamental skills are being developed, children are developing background knowledge, cultural understandings, motivation, executive function skills, knowledge of language structure, and reasoning skills as well. This full range of skills, processes, and dispositions are essential elements of a child's lifelong reading journey.





Infusing Play with Learning: Curriculum, Content, and Context

As with the entire LeapFrog portfolio. products in the LeapFrog Reading Journey Collection reflect our design philosophy. Our child-centered approach ensures that children benefit from a unique combination of experiences and built-in supports to meet their individual needs. Of course, many creators of learning products and programs make this same claim. At LeapFrog, we place an emphasis on design that prompts children's active engagement in play infused with learning. To that end, we think holistically about three elements of the playful learning experience: curriculum, content, and context.

We begin the design of all our products with learning goals and identify pedagogical methods to support those goals. Our electronic reading products include a variety of audio and visual cues, inputs, rewards, and supports that not only delight, instruct, scaffold, and provide immediate feedback, but also allow for independent learning opportunities. These products include audio and visual responses based on a child's interaction to introduce new concepts and vocabulary while promoting language and reading skills.

For example, with Channel Fun Learning Remote[™], Sound Babblers in Stage 1 can press various buttons, switches, and dials on a pretend remote toy to hear phrases, rhymes, songs and silly sounds to build their phonological awareness while exercising their fine motor skills.

Products aimed for older children may include more sophisticated programs and interactions with guiding prompts, assessment activities, and video and audio tutorials. Keeping in mind our childcentered approach, our products typically offer multiple modes of play that can be selected by the child at any time.

For example, in Mr. Pencil® Scribble, Write & Read™, Letter Learners in Stage 3 can explore letter names and sounds as they press letter buttons or learn how to write letters with proper stroke order. Book Readers in Stage 4 who are ready to put their early phonics skills into action can select the Spelling mode and follow the beloved Mr. Pencil character to drag letters to the correct spots to spell words. These intentionally designed learning activities allow us to create products that meet our curricular objectives, while the availability of modes and freely selected activities let kids move at their own pace and pursue the games and play patterns they enjoy. Many items in the LeapFrog Reading Journey Collection offer opportunities for children to build reading skills on their own with video and audio supports, as illustrated in Figure 4.









Figure 4: Video and audio supports in Mr. Pencil's® Scribble, Write & Read™



As another example, our Letter Factory™ learning video, aimed at Word Explorers (Stage 2) and Letter Learners (Stage 3), includes fun movements and songs that children enjoy emulating. As children repeat the movements and songs, they reinforce their understanding of the sound-spelling relationships introduced in the video.

My daughter loves to scream with the letter A when they make their sound "AHHHH".



Letter sounds associated with fun, familiar actions.



Letter sounds associated with fun, familiar actions

When we say we infuse play with learning, we do not mean we offer curricular activity modes alongside separate play modes, or that we simply insert occasional learning prompts or facts as part of a toy or device's responses. Instead, we consider the entirety of the playful experience and how the audio and visual content can support the curricular objectives.

For example, in LeapFrog Get Ready for Phonics Spin and Learn™, Word Explorers in Stage 2 can explore letter sounds when they press an enticing big red button that spins a flashing light. In other modes of play, they can hear fun alliterative phrases like "Mmm Mmm Mermaid in the Moonlight" with a matching illustration to reinforce phonemic awareness. These different elements of the toy's content are designed to work together to serve the curricular objectives.



Letter sounds associated with familiar language sounds.



"Every Letter Makes a Sound" song

Figure 5: Scenes from LeapFrog's Letter Factory DVD

In addition to curriculum and content, we recognize that the context of play is another critical factor that influences playful learning experiences with toys or devices. We intentionally design our products to be used in different ways that the child can choose at any time. For example, with the Scoop & Learn Ice Cream CartTM, children can play on their own with included prompts to mix and match ice cream scoops and serve imaginary customers while practicing color vocabulary, or they can play with other children or caregivers and take roles as a customer or server to foster oral language development.

Our non-electronic offerings provide families with "Ways to Play" activity suggestions designed to promote active learning in multiple ways with the same product. The instruction manual for the Nest & Count Turtle Tower™ includes play activities for parents to share with their children to extend the learning beyond motor development and counting skills to oral language and vocabulary development (see Figure 6).

Ways to Play

Below are ideas to inspire play.

1. Label and Find

Teach children how to describe objects and recognize each object's unique features. Direct them to find specific turtles based on different descriptors, for example: Find the turtle with the triangles on it. Find the purple turtle. Find a turtle that looks happy.

2. Stack and Nest

Help children develop hand-eye coordination by directing them to stack the turtles into a tower or to nest them inside one another. This can also help them to strengthen their fine and gross motor skills as they grasp and move the turtles around. For an added challenge, prompt them to pull the stacked or nested turtles without knocking any over.

3. Compare Sizes

With six uniquely sized turtles, children can look at two or more turtles and observe their size differences. Point out the largest and smallest turtles and use comparative words like: large, larger, and largest; small, smaller, and smallest; big, bigger, and biggest; little, littler, and littlest.

4. Develop Creativity and Imagination

Gather all the turtles and use them as props to tell a story. You might start by introducing the turtles one-by-one giving them unique names and personalities that relate to the emotions on their faces. Then, guide the child through a simple narrative, encouraging their imagination and creativity as they interact with the turtles and you model how to create a playful story.



Since we know that children enjoy different play patterns, share unique passions, and are at different stages in their literacy development, the LeapFrog Reading Journey does not pursue a onesize-fits-all approach (25). Instead, we continually update our portfolio of playful learning experiences to offer families options that fit their child's reading journey, with cozy plush animals that encourage oral language development, interactive books that help boost vocabulary, digital games that systematically teach sound-spelling relationships, and toys that inspire pretend play to promote the development of comprehension and vocabulary skills (26).

LeapFrog partners with parents and caregivers in support of their child's reading journey, grounded in the notion that reading and learning to read can be exciting, pleasurable endeavors for both children and the people who care for them. Our products are meant to help support children's reading development from day one and continue to complement caregivers' efforts as children move into new ages and stages.



As Science Evolves, So Do Our Products

Rooted in our child-centered, playful learning design approach and our mission to partner with families to support children's early reading development, the LeapFrog Reading Journey provides a framework that guides the design of our reading products. This framework reminds us that learning to read is a cumulative process that involves reading-specific skills as well as crosscutting processes and dispositions that foster confidence and a love of reading. We understand that there is variability in children's development of these different skills, processes, and dispositions, so we see the age ranges for the four Reading Journey stages as rough guidelines. Our approach to product design prioritizes flexibility in how children play with our products to accommodate their specific learning stages, interests and affinities, and play contexts.

The LeapFrog Reading Journey is based on findings from decades of research that have led to a high degree of consensus in terms of factors that contribute to reading development and effective reading instruction. At the same time, we bear in mind that the fields of science that inform our understanding of how children learn to read are, by definition, grounded in ongoing, "systematic study based on observation, experimentation, and the testing of theories against the evidence obtained" (27). As this research is ongoing, LeapFrog's learning design continues to evolve as well. We are informed by the latest research in the fields of cognitive development, neuroscience, and other learning sciences. As new findings emerge, the LeapFrog Reading Journey will evolve in turn.



At LeapFrog, we take pride in our rich learn-to-read heritage and remain dedicated to creating toys, books, and games that reflect evidenced-based principles and practices. We know that partnering with families is a privilege based on trust, and we are committed to staying abreast of reading-related research. With this knowledge, we will continue to provide a portfolio of products and parent resources that will support children's reading development as they go about their wonder-filled work of play.



- (1) Moon, C., Lagercrantz, H., & Kuhl, P. K. (2013). Language experienced in utero affects vowel perception after birth: A two-country study. *Acta Paediatrica*, 102(2), 156-160. https://doi.org/10.1111/apa.12098
- (2) Armbruster, B. B., Lehr, F., Osborn, J., National Institute for Literacy (U.S.), & RMC Research Corporation. (2003). *A child becomes a reader: kindergarten through grade 3* (2nd ed., spring 2003). National Institute for Literacy.
- (3) Cates, C., et al. (2017, May 6-9). Early reading matters: Long-term impacts of shared book reading with infants and toddlers on language and literacy outcomes. Presented at the Pediatric Academic Societies Meeting, San Francisco, CA.
- (4) Scarborough, H. S., Neuman, S. B., & Dickinson, D. K. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 97–110). Guilford Press.
- (5) Louis, A. M. (1995, December 26). Berkeley toy maker has wooden roots. SFGate. https://www.sfgate.com/business/article/Berkeley-Toy-Maker-Has-Wooden-Roots-3017321.php
- (6) Mervosh, S. (2023, April 16). 'Kids can't read': The revolt that is taking on the education establishment. The New York Times. Retrieved from https://www.nytimes.com/2023/04/16/us/science-of-reading-literacy-parents.html
- (7) Storey, N., & Zhang, Q. (2024). A meta-analysis of the impact of COVID-19 on student achievement. *Educational Research Review*, 44, 100624. https://doi.org/10.1016/j.edurev.2024.100624
- (8) Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., Committee on Psychosocial Aspects of Child and Family Health, Council on Communications and Media, Baum, R., Gambon, T., Lavin, A., Mattson, G., Wissow, L., Hill, D. L., Ameenuddin, N., Chassiakos, Y. (L.), Cross, C., Boyd, R., Mendelson, R., Moreno, M. A., Radesky, J., Swanson, W. S., Hutchinson, J., & Smith, J. (2018). The power of play: A pediatric role in enhancing development in young children. *Pediatrics*, 142(3), e20182058. https://doi.org/10.1542/peds.2018-2058
- (9) Gray, J., Bulat, J., Jaynes, C., & Cunningham, A. (2009). LeapFrog learning design: Playful approaches to literacy, from LeapPad to the Tag Reading System. In A. Druin (Ed.), Mobile technology for children (pp. 175-198). Morgan Kaufmann Publishers.
- (10) Pyle, A., & Danniels, E. (2017). A continuum of play-based learning: The role of the teacher in play-based pedagogy and the fear of hijacking play. Early Education and Development, 28(3), 274–289. https://doi.org/10.1080/10409289.2016.1220771
- (11) National Institute of Child Health and Human Development. (2000). Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769). U.S. Government Printing Office. https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf

- (12) Duke, N. K., & Cartwright, K. B. (2021). The science of reading progresses: Communicating advances beyond the simple view of reading. *Reading Research Quarterly*, 56 (S1), S25–S44. https://doi.org/10.1002/rrq.411
- (13) Aboud, K. S., Bailey, S. K., Petrill, S. A., & Cutting, L. E. (2016). Comprehending text versus reading words in young readers with varying reading ability: Distinct patterns of functional connectivity from common processing hubs. *Developmental Science*, 19(5), 632-656. https://doi.org/10.1111/desc.12422
- (14) Colé, P., Duncan, L. G., & Blaye, A. (2014). Cognitive flexibility predicts early reading skills. *Frontiers in Psychology*, 5, 565. https://doi.org/10.3389/fpsyg.2014.00565
- (15) Gambrell, L. B., Palmer, B. M., Codling, R. M., & Mazzoni, S. A. (1996). Assessing motivation to read. *Reading Teacher*, 49(7), 518–533. https://doi.org/10.1598/RT.49.7.2
- (16) Campana, K., Mills, J. E., Capps, J. L., Dresang, E. T., Carlyle, A., Metoyer, C. A., & Kotrla, B. (2016). Early literacy in library storytimes: A study of measures of effectiveness. *The Library Quarterly*, 86(4), 369-388. https://doi.org/10.1086/688028
- (17) Kim, J. S. (2007). The effects of a voluntary summer reading intervention on reading activities and reading achievement. *Journal of Educational Psychology*, 99(3), 505–515. https://doi.org/10.1037/0022-0663.99.3.505
- (18) Wolf, M., & Stoodley, C. J. (2007). Proust and the squid: The story and science of the reading brain (1st ed.). HarperCollins.
- (19) Kuhl, P. (2015). How babies learn language. Scientific American, 313(5), 64-9.
- (20) Hoecker, J. L. (2019, February 22). Toddler speech development: What's typical for a 2-year-old? Mayo Clinic. https://www.mayoclinic.org/healthy-lifestyle/infant-and-toddler-health/expert-answers/toddler-speech-development/faq-20057847
- (21) Kuhl, P. (2004). Early language acquisition: Cracking the speech code. *Nature Reviews Neuroscience*, 5(11), 831–843. https://doi.org/10.1038/nrn1533
- (22) Adams, M. J. (1990). Beginning to read: Thinking and learning about print. Cambridge, MA: MIT Press.
- (23) Treiman, R. (2006). Knowledge about letters as a foundation for reading and spelling. In R. M. Joshi & P. G. Aaron (Eds.), *Handbook of orthography and literacy* (pp. 581-599). Mahwah, NJ: Erlbaum.
- (24) Ehri, L. C. (2015). How children learn to read words. In A. Pollatsek & R. Treiman (Eds.), *The Oxford handbook of reading* (pp. 293–310). Oxford University Press.
- (25) Reading Recovery Council of North America. (n.d.). The four fallacies of the media's representation of literacy. *Reading Recovery*. https://readingrecovery.org/the-four-fallacies-of-the-medias-representation-of-literacy/
- (26) Rand, M. K., & Morrow, L. M. (2021). The contribution of play experiences in early literacy: Expanding the science of reading. *Reading Research Quarterly*, 56(S1), S239–S248. https://doi.org/10.1002/rrq.383
- (27) Oxford English Dictionary. (2024). Science. In *Oxford English dictionary*. Retrieved July 30, 2024, from https://www.oed.com/view/Entry/172672