

# *the* BUILDING READING BRAIN

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**BY KATHY BARCLAY, EdD & LAURA STEWART**  
Professor Emeritus of Reading/Early Childhood at Western Illinois University      Chief Academic Officer, Professional Development at Highlights Education Group

# BUILDING THE READING BRAIN

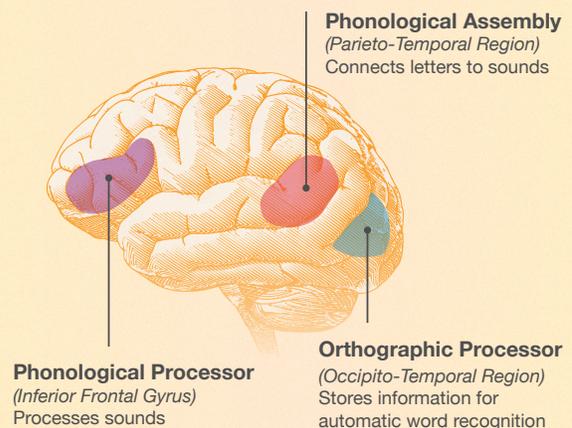


Major advances in our understanding of effective reading instruction have happened during the past decade. As studies from the fields of neuroscience and neuropsychology have accelerated, significant evidence has mounted, underscoring the importance of reading basics for all children. Research-based reading programs that emphasize phonological awareness, phonics, the rules of spelling and writing, as well as comprehension have not only been shown to be critical for all early readers, but have even been found to “normalize” brain function for struggling readers (Shaywitz & Shaywitz, 2004). As the American Psychological Association (2014) states: “Just as promising is the research that shows children who might otherwise have trouble learning to read can be identified early and taught before their reading problems are apparent.”

## A LOOK INSIDE THE BRAIN

What happens in the brain when children read? Neuroscientists around the world have used functional magnetic resonance imaging (fMRI) extensively to map the areas of the brain associated with language and reading. Their research has identified three brain processing systems that are essential for reading (Sandak, Mencl, Frost, & Pugh, 2004; Houdé, Rossi, Lubin, & Joliot, 2010).

### REGIONS OF THE BRAIN ASSOCIATED WITH READING





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“These elements must be taught systematically, comprehensively, and explicitly; it is inadequate to present the foundational skills of phonemic awareness and phonics incidentally, casually, or fragmentally.”

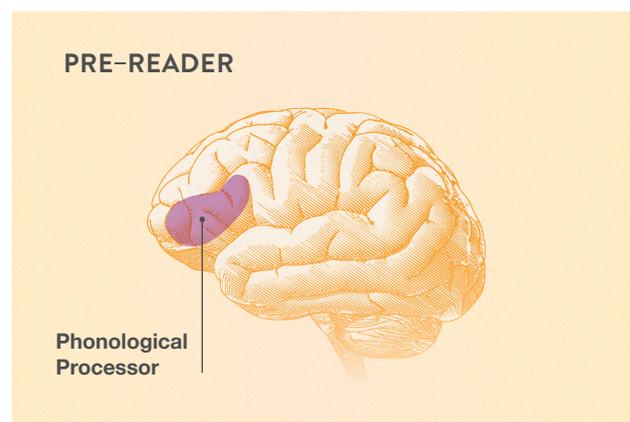
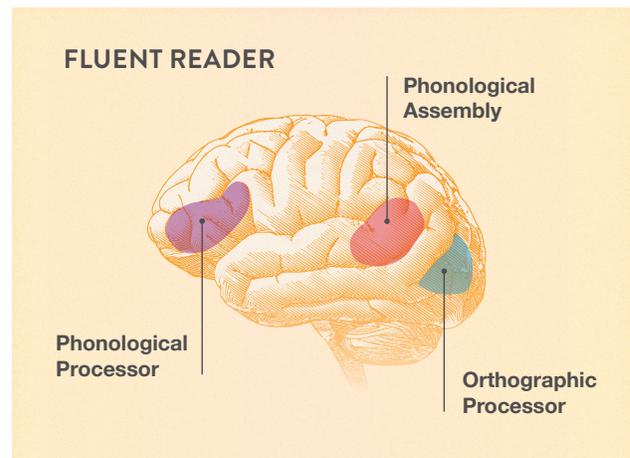
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—Shaywitz & Shaywitz, 2004, p. 6.

An area on the left side, toward the front of the brain, helps us process sounds in words. On the left side, just above and behind the ear, is where we connect letters to sounds. On the back-left side of the brain is the word-form area where we store all information about words—how they look, how they sound, and what they mean.

In brain scans of skilled readers, the three areas on the left side of the brain are all activated and working together during reading. The reader converts letters into sounds, blends the sounds to read words, and reads text fluently. This process happens incredibly quickly—in as little as 150 milliseconds for a word (Shaywitz, 2003). The extreme automaticity of these word assembly steps results in fluent, effortless reading.

Brain scans of fluent readers look different than do those of pre-readers and struggling readers. Fluent readers have amassed a network of neural connections in and between the regions of the brain that process sounds, connect letters to sounds, and recognize written words. Though the human brain is simply not hard-wired for reading, we can and do learn how to read because neural circuitry can be built through successful instructional experiences (American Psychological Association, 2014; Hruby & Goswami, 2011; Shaywitz & Shaywitz, 2004; Shaywitz & Shaywitz, 2008).



Highlighted areas show where brain activity occurs during reading tasks.

## IMPLICATIONS FOR READING INSTRUCTION

Although it was once thought that learning to read was as natural as learning to speak, brain research over three decades has proven otherwise (Eden, 2015). Reading must be taught, and how it's taught matters: "It is simply not true that there are hundreds of ways to learn to read... when it comes to reading, we all have roughly the same brain that imposes the same constraints and the same learning sequence" (Dehaene, 2010, p. 218).

Beginning readers need instruction that will help them develop the neural connections required for reading automaticity. Phonics instruction that emphasizes the

mapping of letters to speech sounds (i.e., phonics) is the most efficient way to foster this process (Dehaene, 2010, p. 227). Neuroscience has now confirmed what educational research has revealed time and time again over the past three decades: systematic and explicit teaching of phonics is a cornerstone of effective beginning reading instruction. Using brain imaging techniques, researchers have found that instruction of new words through a phonics approach results in an increased speed of recall and increased brain activity in the left hemisphere (Taylor, Davis, & Rastle, 2017; Yoncheva, Wise, & McCandliss, 2015).



“ [The] process whereby written words are converted into strings of phonemes must be taught explicitly. It does not develop spontaneously, and must be acquired. [Reading instruction] must aim to lay down an efficient neuronal hierarchy, so that a child can recognize letters and graphemes and easily turn them into speech sounds. All other essential aspects of the literate mind—the mastery of spelling, the richness of vocabulary, the nuances of meaning, and the pleasures of literature—depend on this crucial step. ”

—Dehaene, 2010, p. 219

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“ *...using phonic-based methods is a better use of limited instructional time than using meaning-based methods, both for learning to read aloud and comprehend written words accurately.* ”

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—Taylor, Davis, & Rastle, 2017, p. 844



## THE IMPORTANCE OF DECODABLE TEXT

As important as phonics instruction is, it cannot stand alone. To build automaticity and fluency, beginning readers must be provided with ample practice in text that is closely aligned with the sequence of skills being taught (Dehaene, 2010; Mesmer, 2001; Sousa, 2014). Research strongly supports use of decodable text in the early grades (Mesmer, 2001; Cheatham & Allor, 2012). Decodable, or phonetically controlled text, contains words consisting of those letters and letter-sounds that have been explicitly taught. Reading decodable text gives children practice applying the letter-associations they are learning and reinforces their understanding of the alphabetic principle and the mapping of letters to sounds in their brains.

As children have success reading decodable text, they learn to depend on phonics as their primary decoding strategy: “Decodability is a critical characteristic of early reading text...it increases the likelihood that students will use a decoding strategy and results in immediate benefits particularly with regard to accuracy” (Cheatham & Allor, 2012, p. 2223).

In contrast, some types of texts can lead beginning readers to rely on ineffective strategies. When texts are made up of words with letter-sounds children have not yet been taught, they cannot apply the decoding strategy successfully and instead turn to contextual guessing. While context and pictures are useful for confirming meaning, they will not help children develop automaticity in word recognition. Similarly, when students read texts built around high-frequency sight words, they will employ a visual strategy for word identification, a strategy that will not sustain a reader very far into the process of reading. With patterned texts, children may appear to be reading the words, but are simply memorizing the patterns and repetitive language without applying phonetic decoding skills. Routinely applying ineffective reading strategies builds neural pathways, but in areas of the brain less suited for reading (Hempenstall, 2006). As a result, students in programs that emphasize these other types of texts tend to fare poorly when compared to students in programs that employ decodable text (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998).

# RESEARCH INTO PRACTICE



*The Superkids Reading Program is a powerful comprehensive reading and language arts program that puts brain research into practice for young readers. At the heart of the program are the delightful Superkids characters, whose adventures and activities keep children motivated and engaged as they go about the serious work of learning to read and write.*

## HOW *SUPERKIDS* TEACHES PHONICS

*Superkids* teaches all aspects of reading, but explicit, systematic phonics instruction is the foundation of the program. With its focus on teaching the alphabetic principle, *Superkids* provides exactly what young children need to build the neural network for efficient reading. The program teaches all major sound/symbol relationships directly and intentionally in a sequence that progresses from simple to complex. Once letter-sounds are taught, they are continually reviewed and reinforced in combination with new letter-sounds being taught.

In kindergarten, *Superkids* teaches children the 26 letters of the alphabet, one sound for each letter, and how to blend letter-sounds to decode words. In first grade, children learn more complex sound-spelling patterns with consonant digraphs, long vowels, r-controlled vowels, vowel digraphs, and more. Second graders consolidate the phonics skills they've developed in previous years, while also learning less common sound-spelling patterns. Through the program's explicit and systematic phonics instruction, children emerge from the primary grades with the alphabetic principle rooted in their brains.

## DECODABLE TEXT IN *SUPERKIDS*

In *Superkids*, texts for beginning readers are phonetically controlled to align with the sequence of letter-sound instruction in the program. This ensures children develop the habit of decoding words based on letter-sound correspondence, rather than use other inefficient and less reliable strategies for reading.



Decodable text is sometimes characterized as dull and stilted, but *Superkids* provides decodable fiction and informational texts that engage and motivate beginning readers. Children enjoy getting to know the *Superkids* characters, 13 boys and girls and one dog, whose adventures are featured in decodable fiction at all grade levels. With fun facts and amazing photographs, *Super-Duper* decodable mini-magazines capture children's interest in real-world science and social studies topics. Plus, the *Superkids* Libraries for kindergarten and first grade offer hundreds of decodable books in a variety of fiction and nonfiction genres.

Once the decoding habit is firmly in place, children can transition easily into texts that are not phonetically controlled. Second graders read popular trade book fiction in the Book Club for Super Kids as well as fascinating informational articles in *SUPER Magazine*. Children are able to read these texts successfully because instruction in letter-sound correspondences and decoding in the early grades has shaped their brains for efficient reading.

## COMPREHENSIVE INSTRUCTION WITH *SUPERKIDS*

A strong body of research points to the efficacy of explicit, systematic, cumulative, and multisensory reading instruction that integrates listening, speaking, reading, and writing (Moats, 2011).

Following recommendations gleaned from a strong body of scientific research, *Superkids* teaches the five components of reading—phonemic awareness, phonics, comprehension, vocabulary, and fluency—seamlessly integrated with other language arts. Through the program, children build skills in reading along with handwriting, spelling, writing composition, grammar, and speaking and listening. By the time children complete *The Superkids Reading Program*, they are strong readers and writers, ready to face the academic materials that await them in the intermediate grades.

# BUILDING THE READING BRAIN

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