

The Science Behind Square Panda™

A multisensory phonics learning system

According to the U.S. Department of Education (2016), 64% of U.S. fourth graders perform below proficiency levels in reading. Square Panda™ helps students across skillsets and populations connect phonological skills to reading strategies.

Neuroscience Literacy Principles Underlying Square Panda

Studies show that students benefit most from explicit, systematic instruction that helps them:

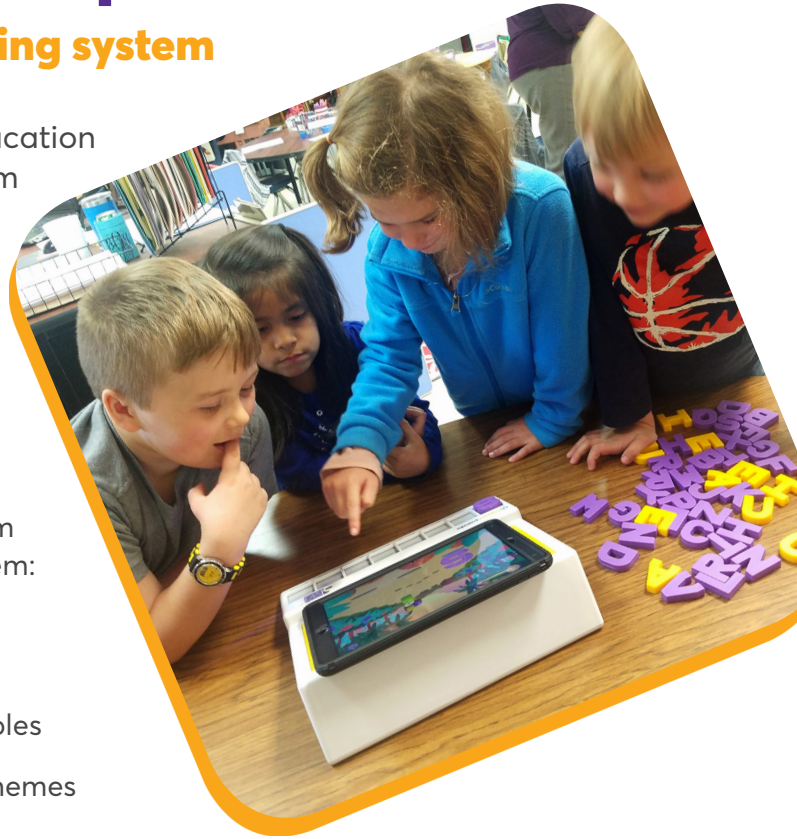
- Become aware of the sound structure of syllables (phonology)
- Isolate the units (phonemes) within syllables
- Identify which letters go with which phonemes
- Blend letter sounds together into words
- Use multisensory cues during learning

The benefits multiply when these skills are taught early in students' reading development.

A key skill for learning to read is to understand and master the code that links visual letters with the speech sounds of language (phonemes). This understanding poses a challenge to the developing brain, because there is no natural correspondence between the sounds of the spoken parts within a syllable (phonemes) and the arbitrary units of print.

To become proficient readers, students must reimagine spoken language as elemental phonemes and combine those phonemes with their corresponding letters to form words. Students' brain networks for seeing shapes and hearing speech must be profoundly reorganized (Schlagger & McCandliss, 2009).

New functional connections between visual and language systems need to be formed within the constraints of neural networks that have naturally developed for seeing shapes and hearing words (Dehaene, & Cohen, 2007).



Research Findings



Phonics and phonological awareness are the most crucial elements of literacy instruction.

Systematic phonics instruction is much more effective in grades PreK-1 than in later grades and leads to higher achievement in reading, spelling, word recognition, and comprehension (National Reading Panel, 2000).

Multisensory perception supports optimal learning, especially for struggling students.

Studies show that specialized brain regions integrate each letter with its speech sound and are especially active when a letter and its sound are presented in a multisensory fashion (Van Atteveldt et al., 2004; Blau et al., 2009; Blau et al., 2010). For struggling students, multisensory cues may provide complementary perceptual information that helps overcome difficulties (Montessori, 1967; Birsh, 1999; Reid, 2013).

High-poverty students benefit the most.

For low socioeconomic students, reading-related experiences—including degree of early print exposure, quality of early schooling, and home literacy environment—interact with phonological awareness to influence reading ability (Hecht et al., 2000; Noble, Farah, McCandliss, 2006; Bowey, 1995).

Second-language learners need additional reading support.

Instruction covering key components of reading, including phonemic awareness and phonics, has a clear benefit for language-minority students (NICHD, 2000). Instructional adjustments for non-English speaking students should include work with phonemes and phoneme combinations that do not exist in their home languages (National Literacy Panel, 2006).

- ✓ Square Panda was developed to support core early reading skills, including phonological awareness, rhyming, blending, segmentation, letter-sound associations, decoding, and encoding, to be used early in the learning process and engage diverse students in grades PreK-3.
- ✓ Square Panda turns tablets into phonics learning stations that leverage sight, sound, AND touch, providing extensive practice in combining letters and sounds along with a tactile component that may enhance memory and learning. A multisensory approach advances low-performing students' foundational skills while others progress through student-directed exploratory play.
- ✓ Square Panda supports children in school and at home—addressing early reading skills and long-term challenges such as dropout prevention while supporting students across their broad learning experience.
- ✓ Square Panda serves as a foundational crosswalk between English and a student's native language, using proven research-based methods to help English language learners understand key phonics principles.

Square Panda is a student-centered tool for enhancing early literacy skills among beginning readers and readers who need additional support in grades PreK-3.



www.squarepanda.com

To learn more,
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