

Research Foundation
Paper

WIGGLEWORKS®

Aligned to
Reading First



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PRODUCT OVERVIEW

WiggleWorks® is a multimedia leveled reading program. The program's three main components—leveled trade books, interactive software, and teacher's materials—create a practical reading instruction program that has been proven effective at raising reading achievement (Schultz, 1995.) WiggleWorks combines today's best thinking about how children learn to read and write with the power of software to create an innovative model for instruction—a model designed to support young learners in their reading, writing, listening, and speaking development.

WiggleWorks includes the following key components to move every child toward reading proficiency:

- Benchmark books to place students into the correct level of instruction
- Carefully leveled trade book library
- Complete teaching plans for each leveled book
- Engaging software including an interactive version of each book plus associated activities
- Classroom management tools to individualize instruction
- Assessment materials to monitor students' progress
- Staff development resources to assist teachers in implementing WiggleWorks in their classroom

WiggleWorks is designed to support students' language development by providing them with a wide range of activities that integrate reading and writing skills while being suited to a variety of learning styles. Therefore, WiggleWorks is an effective beginning literacy program for *all* students, including children who are just learning to read, struggling readers, children with special needs, and English-language learners. With WiggleWorks, teachers can customize the software and the instruction to each student's individual needs, thus encouraging all their students to become independent readers and writers.

Most importantly, WiggleWorks provides purposeful practice and reinforcement in the five key areas of reading instruction as defined in the *Reading First* legislation: phonemic awareness, phonics, fluency, vocabulary, and comprehension.

READING FIRST LEGISLATION

Title 1, Part B, Subpart 1 of the Elementary and Secondary Education Act, as amended by the No Child Left Behind Act of 2001, authorizes *Reading First*. *Reading First* is the academic cornerstone of No Child Left Behind. It recognizes the critical importance of both improving student reading achievement, and implementing programs and strategies proven to be effective.

The primary purpose of the *Reading First* legislation is to ensure that all children in the United States learn to read fluently by the end of third grade. Teaching young children to read is the most critical educational priority facing this country today. The *Reading First* program assists states and districts in applying scientifically based research, as well as the proven instructional and assessment tools consistent with that research to teach all children to read. Specifically, *Reading First* provides the necessary assistance to states and districts to establish research-based reading programs for students in kindergarten through third grade.

Reading First funds focus on providing significantly increased professional development to ensure that all teachers, including special education teachers, have the skills they need to teach these programs effectively. Additionally, the program provides assistance to states and districts in preparing classroom teachers to effectively screen, identify, and overcome reading barriers facing their students.

The program assists states and districts in selecting or developing effective instructional materials, programs, and strategies to implement methods that have been proven to successfully teach reading. In order to measure and monitor student progress, *Reading First* also provides assistance for the selection and administration of screening, diagnostic, and classroom-based instructional reading assessments with demonstrated reliability and validity.

Scientifically based reading research has identified five essential components of reading instruction. Research reveals that children need to master skills in these five interrelated areas in order to become proficient, successful readers. Programs funded under *Reading First* will have to demonstrate their ability to address these components in a comprehensive and effective manner.

To ensure that children learn to read well, explicit and systematic instruction must be provided in these five areas: Phonemic Awareness, Phonics, Fluency, Vocabulary, and Comprehension. The table on the following pages presents critical guidance and research support for *Reading First*, and provides evidence of how WggleWorks responds to and aligns with this important legislation.

READING FIRST RESEARCH AND APPLICATION

PHONEMIC AWARENESS

A large and growing body of empirical evidence clearly indicates that phonemic awareness is one of the best predictors of early reading success.

- Phonemic awareness instruction helps children learn to read, spell, and comprehend text (Report of the National Reading Panel, 2000).
- The most effective method of phonemic awareness instruction focuses on only one or two types of phoneme manipulation that are appropriate for children's level of literacy development (Schatschneider, Francis, Foorman, Fletcher, & Mehta, 1999).
- Oral blending and segmentation are important parts of developing phonemic awareness, which is critical to learning to read and spell with success (Adams, 1990; *Put Reading First*, 2001).
- There is evidence that explicit instruction directing children's attention to the phonological structure of oral language and to the connections between phonemes and spellings helps children if they have not yet grasped the alphabetic principle, or don't yet apply it productively when they encounter unfamiliar words. . . (Snow, Burns, and Griffin, 1998).
- Two powerful predictors of first grade reading achievement are letter-name knowledge and phonemic awareness. Today, phonemic awareness dominates early reading programs in the manner that letter-naming did in previous generations because it is associated with successful first grade reading (Hiebert, Pearson, Taylor, Richardson, & Paris, 1998).
- Measures of preschoolers' level of phonemic awareness strongly predict their future success in learning to read, and this has been demonstrated not only for English, but also for Swedish, Spanish, French, Italian, and Russian (Adams, 1990).
- Poorly developed phonemic awareness distinguishes economically disadvantaged preschoolers from their more advantaged peers. It may be the most important core and causal factor separating normal and disabled readers (Adams, 1990).

WIGGLEWORKS APPLICATION

With WiggleWorks, teachers have the ability to individualize phonemic awareness instruction depending on the needs of their students.

- The WiggleWorks Phonics Teacher's Guide provides instruction and reinforcement along the continuum of reading skills, from phonemic awareness to comprehension.
- The Phonics Teacher's Guide provides opportunities for the teacher to guide students in small-group instruction of phonemes in a variety of positions (initial, medial, and final).
- The Phonics Teacher's Guide can also be used to expand student understanding to include more complex phonemic structures, such as consonant blends and digraphs.
- The WiggleWorks Teaching Cards (provided for each book) allow the teacher to provide small-group instruction that integrates letter-sound correspondence with spoken language activities, such as rhyming, syllabication, or manipulating onsets and rimes.
- The *Read Aloud*, *Write*, and *My Book* areas of the WiggleWorks software encourage students to use their knowledge of letters and sounds to monitor their reading by recording themselves and playing the recording back.
- Students can use their beginning knowledge of letters and sounds to monitor their writing by listening to the synthesized voice read their writing back in the *Write* or *My Book* areas of the WiggleWorks software.
- Using the Magnet Board with text-to-speech function in the WiggleWorks software, students can break words into their component sounds and work with phonemes in a variety of ways, including segmenting and blending.

PHONICS

Early, systematic, and explicit instruction in phonics results in higher levels of beginning reading achievement.

- Phonics programs are most effective when they are systematic—meaning that the program of instruction includes a carefully selected set of letter-sound relationships that are organized into a logical sequence (Report of the National Reading Panel, 2000).
- Systematic and explicit phonics instruction significantly improves children’s word recognition, spelling, and reading comprehension, and is effective for children from various socioeconomic levels (Report of the National Reading Panel, 2000).
- Instruction designed to develop children’s sensitivity to spellings and their relationship to pronunciations should be of a paramount importance in the development of reading skills. This is precisely what is intended of good phonics instruction (Adams, 1990).
- The most well respected value of letter-sound instruction is that it provides children with a means of deciphering written words that are not familiar as wholes. While applying their knowledge of letter-to-sound correspondences, children can sound words out, discovering or confirming their identity by themselves (Adams, 1990).
- Poor decoding skills lead to little reading and little opportunity to increase one’s basic vocabulary and knowledge through reading, thus leaving a shaky foundation for later reading comprehension (Juel, 1988).
- Classroom research reveals that on average children who are taught phonics get off to a better start in learning to read than children who are not taught phonics. This advantage is most apparent on tests of word identification. Children in programs in which phonics is heavily stressed also perform better on tests of sentence and story comprehension, particularly in the early grades (Anderson, Hiebert, Scott, & Wilkinson, 1985).

WIGGLEWORKS APPLICATION

With Wiggle Works, students systematically and independently practice new phonics skills, and apply what they have learned to both reading and writing about the selected literature.

- The WiggleWorks Phonics Teacher’s Guide reinforces phonics skills explicitly, first in isolation and then in words and connected text.
- The Phonics Teacher’s Guide can also be used in small groups of more advanced students to instruct them in syllabication, prefixes, and suffixes.
- The teacher can reinforce decoding skills with the WiggleWorks Teacher’s Cards in small groups or through a variety of writing activities.
- Students can then apply these phonics skills to their reading of WiggleWorks books on and off the software.
- The software’s Magnet Board with the text to speech function can be used to introduce a new letter sound, read a whole word, or practice blending.
- Students can also use the Magnet Board to break words into their component sounds by manipulating letters and hearing the sounds each letter makes.
- At higher stages, students may use the Magnet Board to focus on syllabication, prefixes, and suffixes. These skills are then applied to reading and writing about the selected literature.
- Students can develop decoding skills by seeing the text highlighted word by word (the teacher would need to select this option), as they follow along in the *Read Aloud* section of the software.
- Students can further develop their decoding skills by clicking on words to hear them read in the *Read* section of the WiggleWorks software.

FLUENCY

The National Reading Panel (2000) concluded that guided, repeated reading has a significant positive impact on word recognition, fluency, and reading comprehension.

- Repeated and monitored oral reading improves reading fluency and overall reading achievement (Report of the National Reading Panel, 2000).
- Students can improve their fluency by:
 1. Hearing models of fluent reading
 2. Repeated reading with guidance
 3. Combining reading instruction with reading practice at their independent level of reading ability (Wolf & Katzir-Cohen, 2001).
- Monitoring and assessing student progress in reading fluency is useful in evaluating instruction and setting instructional goals. It can also be highly motivating to students (*Put Reading First*, 2001).
- Despite its importance as a component of skilled reading, fluency is often neglected in the classroom. If text is read in a laborious and inefficient manner, it will be difficult for the child to remember what has been read and to relate the ideas expressed in the text to his or her background knowledge (Report of the National Reading Panel, 2000).
- Rapid recognition of the core group of high-frequency words is gained through extensive involvement in reading and writing. For young children, these occasions typically involve oral reading where children can read quickly with expression and with good phrasing a process described as fluent reading (Hiebert, Pearson, Taylor, Richardson, & Paris, 1998).
- For children to become fluent readers who devote their attention to the meaning of text, many opportunities to read appropriately difficult text are needed throughout the primary grades (Hiebert, Pearson, Taylor, Richardson, & Paris, 1998).

WIGGLEWORKS APPLICATION

With Wiggle Works, students listen to models of fluent reading, practice oral reading fluency, and monitor their own progress. Teachers have the opportunity to regularly assess their students' level of instruction and fluency.

- Students continually build their fluency while reading connected text at their "just-right" level. Students can read the same WiggleWorks book in print and software formats, which encourages rereading and maximizes fluency building.
- WiggleWorks provides students opportunities to hear reading modeled with proper pacing, phrasing, and intonation by the narrator as many times as they require. Students can hear fluent models both in the software *Read Aloud* area and using the audiocassettes.
- WiggleWorks software encourages students to read aloud and helps them to monitor their own fluency growth. Students can record themselves reading the books and play back these recordings, both to monitor their own progress and to demonstrate how much they have learned.
- WiggleWorks contains assessment materials to record students' progress and level of fluency. The Software Manager keeps a record of what work students have completed, how long they spent on each activity, and a portfolio of their work to help teachers gauge student progress.
- Teachers can use Oral Fluency Assessments (OFAs) with WiggleWorks benchmark books to help determine the appropriate reading level for each of their students to read fluently.

VOCABULARY

Exposing children to new vocabulary multiple times in multiple contexts increases reading comprehension.

- It is important that children notice when they encounter new words and want to learn them. This is referred to as *word consciousness*. There are numerous ways to draw children's attention to and interest in the words around them. These methods include playing with words through games, songs, and humor (Graves & Watts-Taffe, 2002).
- Direct instruction of the vocabulary related to a text leads to better comprehension. Effective direct instruction in vocabulary includes *both* specific word instruction and instruction in word-learning strategies (*Put Reading First*, 2001).
- Students learn a significant amount of words through everyday experiences with oral and written language, and one of the most important techniques of gaining vocabulary is through listening to others read aloud (Report of the National Reading Panel, 2000).
- While the use of computer technology in reading is still in its infancy, recent studies do report that it may be a powerful way of increasing vocabulary. The computer can be used as an adjunct to direct vocabulary instruction, thus allowing students to obtain more practice in learning new vocabulary (Davidson, Elcock, & Noyes, 1996; Heller, Stumer, Funk & Fezor, 1993).
- Written text places high demands on vocabulary knowledge. Even the words used in children's books are more rare than those used in adult conversations and prime time television. Learning new concepts and the words that encode them is essential to comprehension development (Snow, Bums, & Griffin, 1998).
- Exposure to lots of text, including children's independent reading and read alouds by teachers, improves comprehension achievement, vocabulary growth, and learning English as a second language (Hiebert, Pearson, Taylor, Richardson, & Paris, 1998).
- Children perform better with vocabulary instruction that involves multiple exposures to vocabulary in authentic texts, the extension of learned words beyond the classroom context, and high-frequency repetitions of the new words (McKeown, Beck, Omanson, and Pople, 1995).

WIGGLEWORKS APPLICATION

With Wiggle Works, children have multiple opportunities to develop their vocabulary through reading, writing, listening, and making meaning of text.

- WiggleWorks provides direct instruction of specific vocabulary words that students will encounter in their reading. The Teaching Cards help teachers to build background knowledge of new concepts and teach content-related vocabulary before students read each book.
- Vocabulary instruction is offered in multiple contexts, including pre-reading for new words, discussion of word meanings, and explicit follow up lessons to review new vocabulary repeatedly.
- Software features allow students to store lists of words that are unfamiliar to them as they read. Students refer to these "My Words" as they incorporate new words into their writing. Students can later print their word lists to make flashcards for vocabulary practice.
- Creative writing activities based on the WiggleWorks stories reinforce the vocabulary that students learn. In the *My Book* and *Write* areas of the software, students use their word lists to modify the story's text and illustrations. Students can print the new versions of these books to take home, or enlarge them to make class Big Books to extend the vocabulary learning.
- WiggleWorks motivates students by encouraging them to take ownership of their vocabulary development through using newly learned words in their reading and writing, and by playing and innovating with those words.

COMPREHENSION

Research has revealed that text comprehension can be improved by instruction in specific reading comprehension strategies.

- Six strategies have been demonstrated to improve comprehension: monitoring comprehension, using graphic organizers, answering questions, generating questions, recognizing story structure, and summarizing (*Put Reading First*, 2001).
- Students can be taught to use comprehension strategies through direct explanation, modeling, guided practice, and application. Comprehension strategies can also be taught through cooperative learning (Report of the National Reading Panel, 2000).
- Throughout the early grades, reading curriculum should include explicit instruction in strategies such as summarizing the main idea, predicting events and outcomes of upcoming text, drawing inferences, and monitoring for coherence and misunderstandings. This instruction can take place while adults read to students, or when students read to themselves (Snow, Burns, & Griffin, 1998).
- In kindergarten and first grade, teachers promote a stance of “thinking while reading” through the questions they ask about books read aloud and together (Hiebert, Pearson, Taylor, Richardson, & Paris, 1998).
- Reading and discussing stories with children are critical parts of emergent literacy. Effective teachers engage children in pre-reading discussions that tap into their prior background knowledge. After reading and during subsequent rereading, teachers engage children in reading comprehension by deciphering text and by relating it to their personal experience (Pressley, 2002; National Association for the Education of Young Children & The International Reading Association, 1998).

WIGGLEWORKS APPLICATION

With WiggleWorks, children focus on the text structure and meaning both on-screen and through guided reading and discussion of each book.

- With the WiggleWorks leveled books and their interactive versions included with the software, students practice critical comprehension skills, including determining the main idea, retelling, and predicting.
- Students have the opportunity to use the “Message of the Book” feature in the software’s *Read Aloud* area to gain background knowledge about the book before reading.
- Teachers use the instructional ideas on the WiggleWorks Teaching Cards in whole class or small-group instruction to develop comprehension strategies, including: previewing the book, building background knowledge, using context clues, visualization, and descriptive readings.
- Writing activities in the WiggleWorks software provide reinforcement of comprehension skills and encourage active processing of text. Students can write a response to their teacher’s recorded questions about the literature in the *Write* area, then save and print their work for later review and evaluation.
- WiggleWorks develops students’ understanding of text structure and meaning through guided reading and discussion of each book with the whole class or small groups, followed by reinforcement of the same books with the interactive versions.
- Multiple genres are explored in WiggleWorks, including nonfiction texts. Students have opportunities to read purposefully and discuss the meanings of different types of text. The Teaching Cards call for discussion and analysis of these texts before, during, and after reading.

The table on the following pages highlights two educational research-based factors of the WiggleWorks program: motivation and universal design. WiggleWorks is strongly aligned to current research findings about how to motivate young children to learn to read. In addition, WiggleWorks is universally designed, enabling the program to meet the needs of a wide range of children.

EDUCATIONAL RESEARCH GUIDANCE

UNIVERSAL DESIGN

“Universal Design has become an important focus of federal research and development, state and district policy, and planning for commercial publishing.”

—David Rose, Executive Director of CAST

- Teachers and librarians are uniquely positioned to lead the way in exploring and implementing universal design. Familiarity with the curriculum across grade levels, expertise in integrating technology, and knowledge of diverse student learning styles and needs through contact with the entire student body combine to provide a solid foundation of skills necessary for this endeavor (Neumann, 2003).
- The U.S. Department of Education has identified Universal Design for Learning as a promising practice and funded research competitions to expand the field. Many states and districts have also written universal design standards into their adoption practices (Rose, 2003).
- Children with special needs face a variety of challenges when learning to read. Some children may have difficulty seeing or recognizing letters. Some may be physically unable to turn the pages of a book. Still others may be English-language learners who have little exposure to English at home (Rose & Meyer, 2002).
- Principles of universal design provide a flexible and customizable reading environment for all students. These principles include:
 1. Alternative representations of information
 2. Multiple options for expression and control
 3. Multiple options for engagement (CAST, 2002).
- Researchers have found that young readers, regardless of ability, are more engaged in and successful at learning to read if the literacy curriculum includes flexible, universally designed multimedia tools and inclusion strategies (CAST, 2002).
- There is a growing body of research demonstrating the positive impact of computer-supported reading instruction and electronic picture books on students' literacy development, comprehension, and level of engagement. Supported digital learning environments are the future of educational technology (O'Neill & Dalton, 2002).

WIGGLEWORKS APPLICATION

With WiggleWorks, students and teachers have access to one of the first universally designed curriculum programs that set a precedent for publishers and software developers.

- WiggleWorks has built-in features and options that help make the program accessible to *all* students. WiggleWorks' most important universal design features include:
 - Instructional options such as reading, writing, listening, and book-making
 - Customizable presentation options, including text size, background color, recorded sound, and graphics
 - Read aloud options, including word-by-word and line-by-line
 - Single-switch access
 - Customizable settings to support various disabilities and learning styles
 - Customizable word lists to enhance spelling skills.
- WiggleWorks meets the universal design criteria: *multiple representations of information* by providing text attributes that are customizable throughout the program.
- WiggleWorks meets the universal design criteria: *multiple options for expression and control* by offering activities with a variety of choices for expression such as writing, drawing, and recording.
- WiggleWorks meets the universal design criteria: *multiple options for engagement* by offering ways for teachers to structure learning experiences closely or enable students latitude to explore, construct, and create.
- WiggleWorks software provides teachers with a variety of ways to customize, personalize, and manage their students' learning experiences. For example, the Software Manager allows teachers to modify the WiggleWorks program to meet their students' individual learning, sensory, and physical access needs, thus ensuring that each student receives appropriate instruction and support.
- Teachers can select the screen keyboard option for students with visual-motor difficulties. With the screen keyboard, a scanning option allows even a child with a severe motor disability to choose letters by pressing a single switch. These tools ensure that every child can use the computer successfully.

MOTIVATION

The National Research Council's *Preventing Reading Difficulties in Young Children* has identified three potential obstacles children face when learning to read: 1. Difficulty understanding and using the alphabetic principle 2. Failure to transfer the comprehension skills of spoken language to reading, and 3. *The absence or loss of an initial motivation to read* (Snow, Bums, & Griffin, [Eds.], 1998).

- The National Reading Panel: *Reports of the subgroups* concluded in their "Computer Technology and Reading Instruction" report that computers do have a motivational use in reading instruction and a motivational advantage over conventional teaching methods (National Reading Panel: *Reports of the subgroups*, Michael L. Kamil, Chair).
- Engaged reading is strongly associated with reading achievement. Students who read actively and frequently improve their comprehension of text as a consequence (Guthrie & Wigfield, 2000).
- When students are engaged in computer-based reading, the teacher's knowledge of individual learners, caring about their progress, and understanding of how to foster their participation is critical (Guthrie & Wigfield, 2000).
- Computer technologies can easily be programmed to deliver suitable types of rewards for student reading progress (Guthrie & Wigfield, 2000).
- Meaningful, higher interest, appropriately leveled texts that engage students provide the required balance to the necessary skill instruction for struggling readers (Braunger & Lewis, 1998).
- The following are research based factors related to increased motivation to read:
 1. A teacher who is a reading model
 2. A book-rich classroom environment
 3. Opportunities for choice
 4. Familiarity with books
 5. Social interaction about books
 6. Literacy related incentives that reflect the value of reading (Gambrell, 1996).

WIGGLEWORKS APPLICATION

With Wiggle Works, children are captivated and motivated by the partnering of books and technology. They are engaged through multiple opportunities for listening, speaking, reading, and writing.

- The *ReadAloud* area, for example, offers children many of the same benefits as listening to a Big Book. Children can use the pictures to decipher text meaning, as well as track the print as it's read.
- In the *Read* area, children can record their own voice and then listen to themselves reading the book. This activity motivates fluent reading by encouraging children to read with expression and appropriate pacing.
- WiggleWorks books are grouped by stage and level. Within each stage of WiggleWorks, there are three levels of books. Each successive level presents "just the right amount" of additional challenge to ensure that children stay motivated and continue to grow in their reading skills and confidence.
- Students can use the technology scaffolding to support themselves while reading, including reinforcing letter-sound associations by clicking on challenging words to have them read aloud. Such scaffolding helps students to experience success and enjoyment while reading each book independently.
- Music, sound effects, and engaging illustrations help pique the interest of young children in the text. Each word or line highlights as it's read, encouraging children to focus on the print and meaning.
- With WiggleWorks, children have choice and control over their learning experience. They can rewrite the stories and modify the illustrations, or write and illustrate their own stories. In addition, students can explore the phonetic patterns and structures of words on the software's Magnet Board.

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