Scientific Research Base for Saxon Phonics and Spelling K–3

Research Base

Foundational Research and Program Efficacy Studies

Introduction

Learning to read is one of the most important steps in a child's educational development. And yet, results from the 2009 National Assessment of Educational Progress (NAEP) reading exams showed that one-third (33 percent) of U.S. fourth-graders have not mastered basic reading skills (U.S. Department of Education, 2010). Studies by O'Conner (2000) and Torgesen (2000) estimated that 20 percent of children in the primary grades struggle with the fundamentals of reading. An analysis of NAEP data led Lee, Grigg, and Donahue (2007) to estimate that one-third of grade 4 students in the United States lack the reading skills needed for them to successfully complete schoolwork.

In the past decade the federal government has funded studies of reading research to evaluate what is known about effective reading instruction. These exhaustive studies revealed five critical components of effective reading instruction: phonemic awareness, phonics, fluency, vocabulary development and comprehension. Numerous independent studies and expert panels have concluded that phonemic awareness and phonics have a direct and positive impact on reading acquisition, and research has also shown that a foundation in phonemic awareness and phonics can positively affect other key elements of literacy, including fluency, vocabulary development and comprehension.

Saxon Phonics and Spelling K–3 is a supplemental series that explicitly teaches phonemic awareness, phonics and fluency in a way that is supported by scientific research and has been proven effective by years of classroom success. Saxon's approach to teaching phonics and spelling concepts is based on solid foundational research in cognitive science and has been found to be consistently effective for children of varying ability levels and socioeconomic backgrounds.

This document highlights the foundational research that supports *Saxon Phonics and Spelling K–3*, the efficacy studies that demonstrate the effectiveness of the series and the elements of an effective reading program. It focuses on two areas of research: foundational and program efficacy studies, and research on the key elements of effective reading instruction. The foundational research includes studies that have been conducted to test and document the effectiveness of educational practices (such as the use of explicit instruction and continual practice distributed across the level). Foundational studies document proven educational practices that stand the test of time. Program efficacy studies, on the other hand, are research studies that have been conducted to test the effectiveness of a specific program or curriculum. The five elements of effective reading instruction identified in this document are taken from the *Report of the National Reading Panel* (National Institute of Child Health and Human Development, 2000).

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Foundational Research and Program Efficacy Studies

Theoretical Framework for Saxon Phonics and Spelling

Saxon's instructional approach to teaching phonics is supported by Gagne's cumulative-learning theory (1968, 1965, 1962), Fitts and Posner's (1967) and Anderson's (2000) theory of cognition, and Anderson's ACT-R theory (2008, 2007, 2004, 1983).

Gagne's Theory of Cumulative Learning

Gagne's theory of cumulative learning is based on the premise that intellectual skills can be broken into simpler skills, which can in turn be broken into even simpler skills. When analyzed, intellectual skill objectives are arranged into a pattern that reveals prerequisite relationships among objectives (Gagne & Briggs, 1974). Thus, lower-level skills must be mastered before higher-level skills can be mastered. When children learn an ordered set of logically sequenced skills in a progressive fashion—the building blocks of cumulative learning—they develop intellectually.

Theory of Cognitive Apprenticeship

Fitts and Posner (1967) and Anderson (2000) suggest that learning is sequential and that the development of expertise moves through three stages: cognitive, associative and autonomous. During the *cognitive stage* learners rehearse and memorize facts related to a particular domain or skill that guide them in problem solving. During the *associative stage* learners detect errors and misunderstandings through continual practice and feedback. During the *autonomous stage* learners have practiced a skill to the extent that it becomes automated, so the amount of working memory needed to perform the skill is reduced. At this point the learner has developed expertise.

Anderson's ACT-R Theory

The ACT-R (adaptive control of thought – rational) framework represents a unified theory of how the architecture of the human brain facilitates learning and development. In the ACT-R architecture, Anderson (2007) describes various modules associated with different regions of the brain. Among these (unfixed in the theory) modules which work in isolation and in concert, are:

- Visual (Perceptual), for identifying objects visually;
- Manual (Motor), for controlling one's hands;
- Declarative, for activating and retrieving memory and known facts (with accessibility determined by past use and relevance to the current goal);
- Goal, for knowing what the current goal is and assessing relevance and usefulness to the current goal; and
- Imaginal (Procedural), for updating the mental representation of the task with new information.

While ACT-R is still a work in progress, and Anderson and colleagues (2004, 2007, 2008) continue to refine their understandings of learning and the human mind, the theory can inform the design of instruction, the structuring of learning tasks for students, and the understanding of how students acquire new knowledge and skills. The ACT-R architecture emphasizes the importance of sequential tasks, goals for learners, practice, learning by doing, and feedback.

The Saxon Pedagogy

Often programs use a massed approach, whereby instruction, practice and assessment for a skill or concept occur within a short period of time and are usually clustered within a single unit or theme. But the Saxon approach distributes instruction, practice and assessments throughout the lessons and school year. At the core of *Saxon Phonics and Spelling K–3* is the premise that students learn best if 1) instruction is incremental, logically sequenced, and distributed across the level; 2) practice is continual, logically sequenced, facilitates the activation and retrieval of known facts and skills, and is distributed across the level; and 3) assessment is cumulative, provides learners with regular feedback, and is distributed across the level. Figure 1 below illustrates Saxon's distributed approach to instruction, practice and assessment. In *Saxon Phonics and Spelling K-3,* the goals for each task are clear, allowing learners to sustain their cognition in service of the goal. To that end, *Saxon Phonics and Spelling K–3* was developed by breaking down complex concepts into related increments, because smaller pieces of information are easier to teach and easier to learn. The instruction, practice and assessment of those increments were then systematically distributed across each grade level. Finally, the daily lessons were field-tested to ensure their grade-level appropriateness and effectiveness.

Figure 1 — Saxon Phonics and Spelling 1. In Saxon Phonics and Spelling, *instruction, practice, and assessment of a concept are distributed throughout the lessons.*

Legend: ■ Instruction ● Practice ▲ Assessment
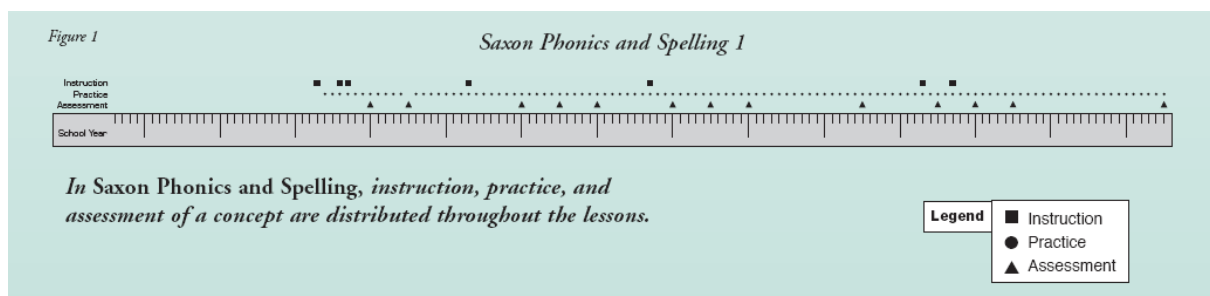
A qualitative case study by Van Horn (1999) showed that the original Saxon *Phonics K–2* helped build students' self-esteem because it allowed them to have successful reading experiences: "enough time is given to allow the understanding of the basic concept of letter sounds; they 'see' letters made into words." A research summary by Patterson and Groff (1999) gave Saxon Phonics a 99 percent rating in decodability and a 100 percent rating in comprehensiveness. In a pretest/posttest comparison study, the Center for Teaching Excellence confirmed that Saxon Phonics "is a highly structured, synthetic, systematic approach to phonics instruction" (Hulett & Lesley, 1999). The researchers also characterized the program as "successful and highly teacher friendly."

Saxon Phonics and Spelling K–3, a revision of the *Phonics K–2* series, was rigorously field-tested to ensure that the efficacy of the instruction, design and classroom management was maintained. In *Saxon Phonics and Spelling K–3,* students continually review and are frequently assessed on previously introduced phonics and spelling concepts, even as they regularly encounter new increments of instruction. This approach ensures that students truly integrate and retain skills rather than forget them. The Saxon pedagogy is unique and research-based; it is also highly effective because it allows students to gain *and retain* critical phonics and spelling skills.
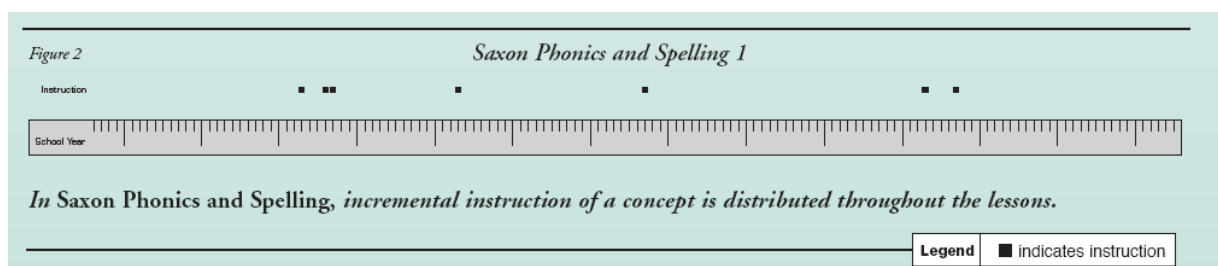
Research Support for the Saxon Approach

Incremental Instruction Distributed across the Level

Literature suggests there is value in a teaching method that uses small, easily digestible chunks of information (Brophy & Everston, 1976; Ausubel, 1969). Numerous studies have demonstrated the importance of using incremental steps when teaching new information (Brophy & Everston, 1976; Rosenshine & Stevens, 1986) and recent research in multimedia learning continues to point to the importance of presenting new information in smaller segments (Mayer & Moreno, 2003). Specifically relevant here, studies of reading instruction with young children have supported the benefits of distributed exposure—or spacing instruction in smaller chunks over time—over massed or clustered instruction (see Childers & Tomasello, 2002, on language acquisition; see Seabrook, Brown, & Solity, 2005, on phonics instruction). Hirsch (1996) points out that the human mind can handle only a small amount of new information at one time: A child's mind needs time to digest the new information, fostering memory and meaning, before it can move on to a set of new information.

Effective incremental development involves teaching increments several times throughout a school year. This method is called "distributed instruction" or "spaced instruction." Distributed instruction is "the tendency, given an amount of time, for spaced presentations of a unit of information to yield much better learning than massed presentations" (Dempster & Farris, 1990). Foundational research has shown that distributed instruction results in greater student achievement than instruction that is not distributed (English, Wellburn, & Killian, 1934). Research has also provided evidence that student recall is superior under conditions of distributed instruction than under conditions of massed instruction (Glenberg, 1979; Hintzman, 1974). Dempster and Farris (1990) concluded that distributed instruction "is one of the most remarkable phenomena to emerge from laboratory research on learning. In many cases, two spaced presentations are about twice as effective as two massed presentations, and the difference between them tends to increase as the frequency of repetition increases."

Figure 2 below illustrates Saxon's distributed approach to incremental instruction.

Figure 2   *Saxon Phonics and Spelling 1*

In Saxon Phonics and Spelling, incremental instruction of a concept is distributed throughout the lessons.

Legend ■ indicates instruction

How Saxon Addresses the Research

In *Saxon Phonics and Spelling K–3,* each increment builds on the foundation of earlier increments, leading students to a deeper understanding of phonics and spelling concepts. The instruction and practice of related increments is carefully distributed throughout the grade level, ensuring that students have the opportunity to master each increment before being introduced to the next related one. A number of research studies have shown the Saxon incremental approach

to be effective. In 1984 Klingele and Reed explicitly identified incremental development as a point of study, comparing the Saxon approach to a nonincremental teaching approach. They found significantly larger test-score increases with the Saxon group, which used the incremental approach. More recently, Hansen and Greene (2000) found that "many students attribute their success … to Saxon's incremental style," and Klein and Marple (2000) noted that an attractive feature of the Saxon program is the development of concepts using methods that are gradual, systematic and accessible to students.

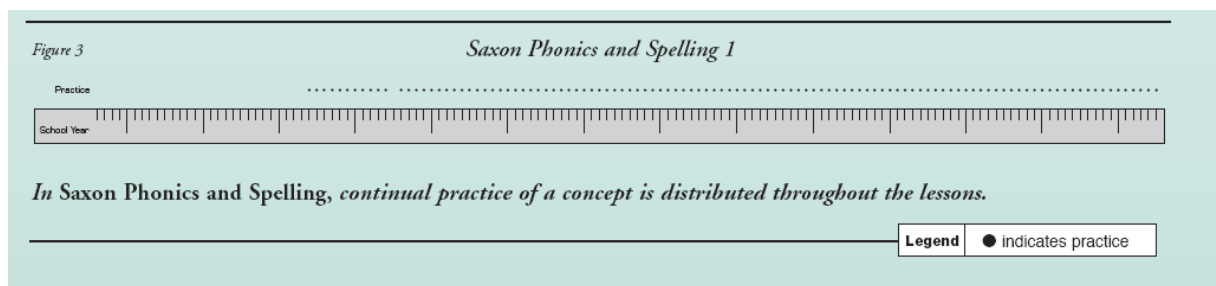## *Continual Practice Distributed across the Level*

Studies have shown that practice and review are effective strategies for improving student achievement at all grade levels (Usnick, 1991; Ornstein, 1990; Finn, 1988; Hardesty, 1986; Good & Grouws, 1979) and that increasing the amount of practice is the most effective way to improve learning (Chase & Symonds, 1992). Numerous research studies have shown that students who are taught with a curriculum that uses continual practice and review demonstrate greater skill acquisition and achievement than students not taught in this way (Mayfield & Chase, 2002; Cull, 2000; Usnick, 1991; Ornstein, 1990; Hardesty, 1986; MacDonald, 1984; Good & Grouws, 1979). Dempster (1991, 1996) noted both that (1) the benefits of review have been proven by research since the early part of the twentieth century and that (2) numerous studies suggest that when reviews are incorporated into the learning process, "not only the quantity of what is learned but also the quality" is affected.

Dempster also found that it was insufficient to review new material an hour or two after its introduction ("massed review"). Instead reviews should occur regularly and be spaced over time (Caple, 1996; Dempster, 1996, 1991, 1988; Dhaliwal, 1987). A review of effective instructional strategies led Pashler, Bain, Bottge, Graesser, Koedinger, McDaniel, and Metcalfe (2007) to conclude that spaced re-exposure to content is one of the most important instructional tools for improved learning.

While most textbooks include review at the end of chapters, research has shown that review should be "systematically planned and incorporated into the instructional… program. Long-term retention is best served if assignments about a particular skill are spread out in time, rather than concentrated within a short interval" (Suydam, 1984). Additional studies support the conclusion that spaced (distributed) practice results in higher performance than massed practice (Rohrer & Pashler, 2010; Donovan & Radosevich, 1999; Dhaliwal, 1987). The findings of Cepeda, Vul, Rohrer, Wixted, and Pashler (2009) suggest that extending the interval of time over which one practices results in an extension of retention of the learned information. Thus, re-visiting learned information over time helps educators achieve the goal of long-term retention. And the evidence for the effectiveness of the spacing effect suggests that it is effective both for simple tasks and for more abstract learning (Rohrer & Pashler, 2010).

In addition to spacing, reviewing content in increments that are interspersed with new content has been shown to be particularly effective. Mayfield and Chase (2002) found that research has shown that practicing mixed, incrementally introduced concepts produces greater skill acquisition and posttest achievement, and Burns and Sterling-Turner (2010) found that increments of practice that combined known and unknown content led to greater retention of learning.

Scientific studies in cognitive science have long supported the instructional use of continual practice, because it develops automaticity—it increases retrieval speed, reduces time required for recognition and decreases interference (Klapp, Boches, Trabert, & Logan, 1991; Pirolli & Anderson, 1985; and Thorndike, 1921). Tronsky and Royer (2003) noted that automated skill developed via intense practice results in a decrease in working-memory resources used, which, according to research, is a major component of successful problem solving. When working-memory capacity is reduced, it leaves room for the cognitive system to process other details and allows the brain to function at higher levels. This automated skill is essential in reading; Rapid automatic naming of letters was identified as one of the top five variables consistently related to later positive conventional literacy outcomes (National Institute for Literacy, 2008). Figure 3 below illustrates Saxon's distributed approach to continual practice.

Figure 3   *Saxon Phonics and Spelling 1*

Practice

School Year

In Saxon Phonics and Spelling, *continual practice of a concept is distributed throughout the lessons.*

Legend | ● indicates practice

How Saxon Addresses the Research

In *Saxon Phonics and Spelling K–3,* practice of an increment is continual and distributed across each grade level. After an increment of a concept is introduced, students are given multiple opportunities to practice it. This allows students to understand and master the increment before being introduced to a related increment of the concept. Continual, distributed practice ensures that concepts are committed to students' long-term memory and that students achieve automaticity of basic phonics and spelling skills. The Saxon pedagogy emphasizes both the teaching of basic phonics and spelling skills and the continual practice of these skills to develop automaticity. The Saxon philosophy holds that all students must acquire basic-skills proficiency before they are able to progress to reading comprehension.

To help students master basic reading skills, Saxon provides daily practice in phonemic/phonological awareness, alphabetics, phonics and spelling, and provides weekly practice in fluency. The structured practices focus on concepts that are difficult for students to master in a short period of time. However, by distributing the practice of similar activities across the level, Saxon gives students continual opportunities to master all concepts. In addition, the practices help prepare students for upcoming concepts by refreshing them on the skills they will need to use as they learn those concepts.

This continual practice ensures that each student has the opportunity to master phonics and spelling concepts and skills to the point of automaticity, thus fostering advanced reading and comprehension. Hartzler (1984) found that Saxon's "review-as-you-go" is of great benefit to students of lower ability. Plato (1998) wrote that by using Saxon, "students can realize that a concept is not simply learned for a test and forgotten." Hansen and Greene (2000) noted that
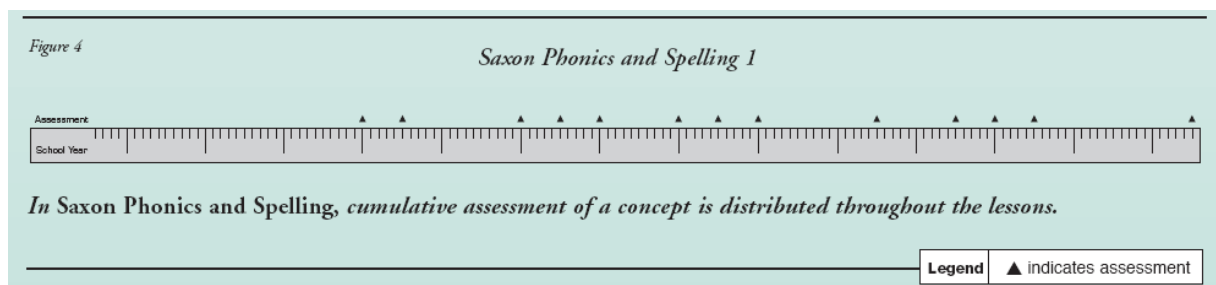
teachers find Saxon's incremental approach to instruction appealing because it allows "students to develop mastery and automaticity through continuous repetition and practice."

Cumulative Assessment Distributed across the Level

According to Fuchs (1995), assessments enhance instruction by monitoring student learning, evaluating instructional programs and revealing remediation needs. Benefits are noted when tests are an integral part of the instructional approach; administered regularly and frequently; collected, scored, and recorded; and used to guide immediate and focused remediation. According to Whitehurst (2003), "We know that at the classroom level, frequent assessment is useful, particularly when teachers are given help on what they should do for children who aren't performing well."

The frequency of assessment is important. Cumulative assessment that is frequent and distributed over time has been found to be effective. A number of studies have shown that students who are assessed frequently have higher test scores than students who are not assessed frequently (Jerald, 2001; Blair, 2000; Black & Wiliam, 1998; Rohm, Sparzo, & Bennett, 1986; and Peckham & Roe, 1977). Dempster (1991) found that higher levels of achievement occur when testing is frequent and cumulative rather than infrequent or related only to content covered since the last test. Figure 4 below illustrates Saxon's distributed approach to cumulative assessment.

Figure 4 — Saxon Phonics and Spelling 1

In Saxon Phonics and Spelling, *cumulative assessment of a concept is distributed throughout the lessons.*

Legend ▲ indicates assessment

Assessment is not just beneficial because of its important role in the cycle of feedback and focused instruction and remediation. The act of being assessed, either formally or informally, also increases student learning and retention. Quizzes appear to reinforce key content and encourage cognitive retrieval of information. Rohrer and Pashler (2010) found that testing strengthens learning; a combination of study and tests is more effective than the spending the same amount of time reviewing the material in another way. In addition, testing—both formal and informal—appears to enhance retention of material (Rohrer & Pashler, 2010; Pashler, Bain, Bottge, Graesser, Koedinger, McDaniel, & Metcalfe, 2007; Roediger & Karpicke, 2006). This "testing effect" has been shown to be quite strong (Butler & Roediger, 2007; McDaniel, Roediger, & McDermott, 2007). Finally, frequent assessment positively impacts students' attitudes(Cotton, 2001).

How Saxon Addresses the Research

Frequent, cumulative assessment is a natural complement to Saxon's distributed approach to instruction and practice. Oral and written assessments, sight word evaluations and spelling tests are built into the program at five-lesson intervals. Designed to meet screening, diagnostic, instructional and evaluative objectives, these assessments help students retain phonics and spelling concepts and provide teachers with tools to gauge student retention of skills as well as determine remediation needs and appropriate instructional pacing.

Research Support for Explicit Instruction

Teachers and researchers alike recognize the correlation between the explicit instruction of concepts and the long-term success of students.

Explicit Instruction

According to Hall (2009), explicit instruction is a systematic approach to instruction that includes a set of delivery and design procedures based on educational research. Hall noted, "There are two essential components to well designed explicit instruction: (a) visible delivery features are group instruction with a high level of teacher and student interactions, and (b) the less observable, instructional design principles and assumptions that make up the content and strategies to be taught." When explicit instruction is effectively employed in the classroom and the instructional design, the teacher (1) explains both what the strategy is and when it is useful; (2) demonstrates use of the strategy; (3) provides opportunities for guided practice; and (4) promotes independent application of the strategies (Center for the Improvement of Early Reading, 2003).

Educational researchers have confirmed that explicit instruction is critical to student learning and that it is more effective than nonexplicit instruction (Ellis & Worthington, 1994; Rosenshine & Stevens, 1986; Darch, Carnine, & Gersten, 1984).A meta-analysis performed by Bangert-Downs and Bankert (1990) found explicit instruction to be the most effective way to teach. A synthesis of relevant literature by Baker, Gersten, and Lee (2002) revealed the positive impact that explicit instruction has on low-achieving students.

How Saxon Addresses the Research

Each lesson in *Saxon Phonics and Spelling K–3* includes a script that is a model of explicit instruction. By following the script, teachers can deliver a clear explanation of the concept being taught.

Research Support for a Double-Dosing Approach

The impact of poor reading abilities early in a child's life is not short-lived, and it contributes significantly to the widening of the achievement gap between poor readers and good readers. A study by Torgesen, Wagner, Rashotte, Alexander, and Conway (1997) found an almost 80 percent chance that a poor reader at the end of first grade will still be a poor reader at the end of fourth grade. Similarly, Fletcher and Lyon (1998) reported that 75 percent of students who are poor readers at the end of third grade will continue to be poor readers in ninth grade.

Double-Dosing

Research indicates that children who are poor readers lack understanding of core reading skills. Several studies have found that children who have difficulty reading lack the ability to structure words phonetically and be able to recognize and transfer words from print to speech (Wagner, Torgesen, & Rashotte, 1994; Stanovich, 1988; Wagner and Torgesen, 1987). The National Institute of Child Health and Human Development (Lyon, 1998) reported that for 90 percent to

95 percent of poor readers, early prevention programs that combine instruction in phonemic awareness, phonics, spelling and reading comprehension can increase reading skills to average levels.

Research has shown that an extra 30 to 40 minutes of reading instruction and practice per day—a technique called "double-dosing"—can improve the abilities of below-level readers, thus helping to close the achievement gap. A study by Simmons et al. (2002) found that providing 30 extra minutes of daily, explicit reading instruction and practice on phonological awareness, alphabet understanding and spelling taught in an explicit manner was highly effective. This study also provided evidence that children who begin a double-dosing program in kindergarten are less likely to leave first grade as below-level readers. According to Simmons et al., "Attaining proficiency in phonological awareness and alphabetic understanding allows the instructional focus to shift to the next high-order skill (e.g., blending, word reading, etc.) to optimize reading development and get students to gaining meaning from text as soon as possible." Intensive intervention through increasing the instructional time was also shown to be effective over the short- and long-term in a study conducted by Torgeson et al. (2001) with elementary students with reading difficulties.

National education committees have also supported programs that give children extra reading instruction that focuses on phonological awareness and alphabet understanding. The American Federation of Teachers (2001) has encouraged schools to use double-dosing to help students become better readers. In addition, the National Reading Panel (National Institute of Child Health and Human Development, 2000) has stressed the necessity of providing quality reading instruction on phonological awareness and alphabetic understanding as early as possible to prevent later reading problems in children.

Many schools have used double-dosing to decrease the number of below-level readers and increase reading scores on standardized tests. The Bethel School District in Eugene, Oregon, implemented a double-dosing program providing at-risk kindergartners with 30 extra minutes of phonics instruction every day, along with bimonthly reading assessments. Before the district implemented the instruction, 15 percent of students left the first grade unable to read. Since implementation only 2 percent have left as nonreaders (Paglin, 2003). A school official attributed student success to the addition of different instructional materials that are used for double-dosing reading instruction.

How Saxon Addresses the Research

Saxon Phonics and Spelling K–3 provides explicit instruction in the three areas research has shown to benefit from a double-dosing approach: phonemic awareness, alphabetic understanding (including phonics) and spelling. Using *Saxon Phonics and Spelling K–3* in conjunction with a core reading program is a structured and effective way of providing a double-dose of instruction in essential foundational skills.

User guides correlated with major basals are available to help teachers seamlessly integrate *Saxon Phonics and Spelling K–3* with the core reading program used in their school. Concepts

taught in the core reading program can be reinforced with the Saxon program through the use of explicit daily instruction, practice and review. The Saxon technique and materials complement the core instruction, teach to all learning styles, and foster assimilation, mastery and complete understanding of concepts and skills. Diagnostic assessments, accompanied by remediation activities, assist the teacher in monitoring student progress and individualizing instruction as needed. The kit format of the programs minimizes the time a teacher spends preparing, and the scripted dialogue maximizes time spent teaching.

The research underlying *Saxon Phonics and Spelling K–3* is supported by improved standardized-test scores and other measures reported by classroom teachers. A purposeful double-dosing approach that incorporates *Saxon Phonics and Spelling K–3* into core reading instruction increases the potential for all students to become more successful readers.

Research Support for Multisensory Instruction

Multisensory Instruction

According to the National Institute of Child Health and Human Development (2000), using a multisensory approach is one of the most effective ways to teach children to read. It is essential to the learning process that students use as many of their senses as possible (Kellough & Kellough, 2003; Gardner, 1999; Kolb, Rubin, & McIntyre, 1979), and research in multimedia suggests that students learn and remember better when information is delivered in more than one mode (verbal and pictorial) and more than one sensory modality (auditory and visual) (Mayer, 2001). In particular, a combination of visual, auditory and kinesthetic elements enhance children's success in reading (Gillingham & Stillman, 1956). By combining the visual, auditory and kinesthetic elements with instruction that is direct, systematic, sequential and cumulative, teachers can better equip struggling students to learn basic language skills (Birsh, 1999). Research in language learning and brain research suggests that instruction through multiple modalities is more beneficial than matching individual sensory preferences—that is, all students benefit when information is presented through multiple senses (Tight, 2010; Willis, 2009; Caine & Caine, 1997). A review of relevant research led Pashler, Bain, Bottge, Graesser, Koedinger, McDaniel, and Metcalfe (2007) to conclude that presenting information graphically *and* verbally is one of seven key strategies for improving student learning.

Many students learn best when they participate in activities that involve physical movement (Fiedler, 2003; Gardner, 1983). Kinesthetic learners can use natural movements to explore concepts, solve creative problems and transfer ideas from one curriculum area to another (Zaxxai, 1997).

The use of multisensory games to introduce, practice and review skills is particularly motivating to students (Bisso & Luckner, 1996). Multisensory games can facilitate instruction and create variety in teachers' instructional delivery (McCarthy, 2000), which helps keep students actively engaged in the learning process (McCarthy, 2000; Birsh, 1999). Games build students' curiosity, help make learning to read fun (Gould & Stern, 1994), and can be an incentive for rapid and accurate decoding (Adams, Foorman, Lundberg, & Beeler, 1998). Metalinguistic games can be

especially effective as an early intervention for children with reading problems (Blachman, 1991).

How Saxon Addresses the Research

Saxon Phonics and Spelling K–3 provides various opportunities for multisensory instruction. Throughout the year students recite the alphabet and play games to practice letter recognition and the alphabet sequence. Other games in the series, such as Letter Tile and Kid Card activities, help students practice word recognition and spelling concepts.

Students frequently engage in an activity called skywriting—tracing a letter in the air. This activity requires students to use the larger muscles of their upper arms, which helps form muscle-brain interactions that connect the physical motions of skywriting a letter with the impression of those motions on the brain. The large motion can then be mimicked by the smaller muscles in the hand that are used for handwriting.

Research Support for Visual Processing

Visual Processing

Visual processing—the ability to recognize information gathered through the sense of sight—is also a critical function for learning to read. Visual processing relies heavily on the use of symbols (e.g., letters and punctuation) and the understanding of spatial relationships (e.g., near and far). Students who are able to process visually are able to match or discriminate between visually presented symbols, a key skill in reading. Research suggests that this early literacy skill correlates with later literacy achievement (National Institute for Literacy, 2008). Because there is nothing inherent in a visual symbol that suggests a letter's name or sound, it is important for students to be given strategies for making letter-sound connections (Ehri, Deffner, & Wilce, 1984). Brain research on neuroplasticity points to the importance of providing patterns and encouraging students to make their own patterns and connections when learning to identify letters and match the letters with sounds (Willis, 2009). Picture, color, and word cues can all help early readers establish these patterns.

How Saxon Addresses the Research

Saxon Phonics and Spelling K–3 promotes visual processing to help students develop the means to mentally organize information for quick and easy retrieval. Each student receives an Alphabet Handwriting Strip for his or her desk. The strips can be used as models for letter recognition, handwriting and sequencing. Pictures of key words help students associate each letter with its most frequent sound. In addition, color cues are used to visually represent the difference between vowels and the consonants. With the Alphabet Handwriting Strip close at hand, students do not have to look far for information to retrieve and transfer to their worksheets. Having information close at hand helps students develop the ability to process information visually.

Saxon Phonics and Spelling K–3 also promotes visual processing through daily flash-card review

activities that bring the teacher in closer proximity to the students. Wall posters that aid letter recognition and show reading and spelling rules promote more advanced visual processing by requiring students to transfer information across longer distances.

The most advanced visual processing activity occurs during the daily flash-card review. Cards with the same letter or letter cluster are grouped together to help students develop a visual grouping that in turn will lead to a mental grouping of the sounds that can be made by the same letter or letter cluster. In addition, sounds will be grouped according to the frequency of their use, from the most to the least frequent sound for the letter or letter cluster. By visually organizing the cards in this manner, students can organize this information mentally for use in reading.

Key Elements of Effective Reading Instruction

Research Support for Phonemic Awareness

Phonemic Awareness

The importance of phonemic awareness—the awareness that words are composed of separate sounds and the ability to hear and manipulate those sounds—has been well documented (Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, & Shanahan, 2001). Research has indicated that phonemic awareness is the best predictor of early reading acquisition (International Reading Association, 1998; Smith, 1998; Stanovich, 1993–1994). A report by the National Institute of Child Health and Human Development (NICHD) concluded that "teaching phonemic awareness directly at an early age" is a key principle of effective reading instruction (Grossen, 1997). In addition, the *Report of the National Reading Panel* (National Institute of Child Health and Human Development, 2000) concluded that phonemic awareness and letter knowledge are the two best indicators of how well children will learn to read during the first two years of instruction. In research, interventions that focused on teaching children skills to crack the alphabetic code, including phonemic awareness instruction, "consistently demonstrated positive effects directly on children's conventional literary skills." (National Institute for Literacy, 2008).

A correlation also has been found between phonemic awareness and reading achievement, as measured by standardized test scores (Adams & Bruck, 1995; Beck & Juel, 1995; Foorman, 1995). Griffith, Klesius & Kromrrey (1992) found that children with high phonemic awareness outperformed those with low phonemic awareness on *all* literacy measures. Researchers have overwhelmingly agreed on the importance of early phonemic awareness in learning to read.

How Saxon Addresses the Research

Saxon Phonics and Spelling K–3 ensures that children develop the phonemic awareness that is critical to reading acquisition. The instruction found in the Saxon program places special emphasis on this critical skill, particularly in kindergarten and first grade. Phonemic awareness is taught through explicit and systematic instruction in all 140 lessons at the kindergarten level and in the first 70 lessons at the first-grade level.

Early phonemic awareness instruction provides children with the essential foundation in the alphabetic principle; phonemic awareness is then reinforced throughout the remainder of *Saxon Phonics and Spelling K–3* as a part of the daily lessons. Through regular play and oral activities that involve such skills as identifying sounds and syllables, rhyming, blending, phoneme segmentation and phoneme deletion, children gradually develop phonemic awareness. A phonemic awareness assessment is used in kindergarten to gauge children's readiness to learn phonics and is used in first grade to diagnose difficulties. With *Saxon* students gain phonemic awareness, and thus are prepared to become successful readers.

Research Support for Phonics

Phonics

It is not merely the teaching of phonics that is important, but the way phonics is taught. Research has indicated that—in addition to early phonemic awareness—explicit, systematic instruction in phonics is a key element of effective reading programs. For decades research studies have endorsed intensive and systematic phonics instruction and proven its effectiveness over nonsystematic instruction at producing better early reading achievement (De Graff, Bosman, Hasselman, & Verhoeven, 2009; Ehri, Nunes, Stahl, & Willows, 2001; Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Stahl, 1992; Adams, 1990; Chall, 1967/1983). Systematic phonics instruction also enhances children's success in learning to read and is significantly more effective than instruction that includes little or no phonics (National Institute of Child Health and Human Development, 2000).

Dr. Samuel T. Orton and Anna Gillingham's pioneering scientific research in systematic phonics instruction demonstrated the importance of teaching "the close association of visual, auditory, and kinesthetic elements forming what is sometimes called the language triangle" (Gillingham & Stillman, 1956). Their studies spanned more than twenty years and drew on the fields of neurology, speech pathology, educational psychology and public school teaching. Furthermore, researchers from the Center for the Improvement of Early Reading Achievement found that phonics programs are effective when they include systematic, explicit instruction and provide ample opportunities for children to apply what they are learning to the reading of words, sentences and stories (Armbruster, Lehr, & Osborn, 2001). The NICHD agreed that sound-spelling correspondences should be taught "explicitly" and that highly regular sound-spelling relationships should be taught "systematically" (Grossen, 1997).

How Saxon Addresses the Research

The phonics instruction in *Saxon Phonics and Spelling K–3* is explicit and systematic. Children are taught the sounds, the letter(s) that make the sounds and how and why these letters come together to form words. All 48 of the most regular letter-phoneme relationships described in the NICHD studies are covered thoroughly in Saxon's programs. In each lesson a single, accessible phonics increment, or concept, is introduced. These concepts are then continually practiced and reviewed in every subsequent lesson so that students are able to read and spell words of increasing complexity. Phonics instruction is reinforced—and each element of Orton and Gillingham's language triangle (auditory, visual and kinesthetic learning) is incorporated—through a variety of engaging activities. Children participate daily in fast-paced flash-card

activities covering key phonics concepts such as letters, sounds, spelling and sight words. Additional card decks provide individualized practice or remediation through games of varying difficulty levels. Worksheets allow children to apply what they have learned and allow teachers to track children's progress daily.

Saxon Phonics and Spelling K–3 provides children with many opportunities to read for meaning through the use of decodable student readers and worksheets that have been carefully written to support the phonics instruction. Fiction and nonfiction decodable student readers are provided at each grade level so that children practice reading with confidence. Controlled vocabulary is used throughout the series. Children read only those letters/letter clusters, sounds and sight words that they have learned. The controlled vocabulary reinforces the concepts that students have learned and allows them to approach and tackle new words confidently. *Saxon Phonics and Spelling K–3* enables students to have many successful reading experiences without struggling with unknown sounds, letters or words.

Research shows that teaching students to read by using decodable and strictly controlled text is highly effective for beginning reading success. According to Hempenstall (1995), "Until reading skills are well advanced, controlled vocabulary texts provide for the integration of new skills into the reading of connected text. For these students, providing only uncontrolled text (no matter how authentic) rarely supplies sufficient practice opportunities for newly taught skills, and hence the skills wither." In addition, using controlled, high-frequency text also provides practice of those words found in most beginning reading materials through third grade (Adams, 1990). As noted by Mathes and Torgeson (2000) "research supports the idea that decodable text is an important component of successful reading programs." And according to the American Federation of Teachers (2007) "Research also shows that the use of decodable text—books and materials containing a high proportion of new words that adhere to phonetic principles students have already been taught—can help young students at the pre-primer and primer levels to master decoding skills and increase speed and fluency."

In *Saxon Phonics and Spelling K-3,* student text is both decodable and carefully controlled. The Saxon approach differs from most other programs in that students are exposed only to words with phonetic concepts that have previously been explicitly taught in the Saxon lessons, optimizing the potential for student success. By contrast most other phonics programs ask students to read words with phonetic concepts they have not yet been taught

In the following two figures, the square indicates when instruction on a particular consonant digraph first occurs. The dot indicates practice or exposure of that concept. And the triangle represents assessment of a digraph.

Figure 5

Saxon Phonics and Spelling 1

Figure 5 illustrates Saxon's unique approach to teaching reading. The figure clearly demonstrates how the explicit instruction of a concept in Saxon Phonics and Spelling takes place before practice or assessment ever occur—thereby demonstrating Saxon's use of tightly controlled and decodable text.

Legend: ■ Instruction ● Practice ▲ Assessment

Figure 6

Phonics Workbook Program, ©2003

Figure 6 illustrates how in a traditional Phonics Workbook Program, practice, exposure to, and even assessment of, a concept often occur before the explicit instruction of that concept, thus demonstrating a lack of tightly controlled and decodable text.

Legend: ■ Instruction ● Practice ▲ Assessment

Research Support for Fluency

Fluency

When phonemic awareness is achieved and letter sound relationships become automatic, children are able to focus on reading fluently—that is, with ease and expression. Fluency provides a bridge between word recognition and comprehension (Chard, Pikulski, & McDonagh, 2006; Armbruster, Lehr, & Osborn, 2001). Fluent and automatic application of phonics skills to text is a critical ability that must be learned before children can maximize oral reading and reading comprehension (National Institute of Child Health and Human Development, 2000). The key to building fluency, acquiring new information and maintaining established information is practice through repeated reading (Samuels, 2002; O'Shea, Sindelar, & O'Shea, 1985). A review of research and theory led Chard, Pikulski, & McDonagh (2006) to conclude that an effective program of fluency instruction must include these eight elements: explicit instruction in letter recognition, phonemic awareness, and phonics; build vocabulary skills; provide instruction and practice with high-frequency vocabulary; teach common word parts and spelling patterns; teach and provide practice for decoding; use appropriate texts to build reading speed; use repeated reading procedures; and monitor fluency development.

How Saxon Addresses the Research

The fluency readers in *Saxon Phonics and Spelling K–3* provide explicit, systematic practice to help children achieve fluency (automaticity) with high frequency words. These fluency readers, which come in three distinct reading levels (easy, average and challenging), provide engaging content (fiction and nonfiction) that children can read independently, in pairs or in small groups. The three levels of each fluency reader are centered on the same theme, but they have differences in genre, sentence complexity, syntax and number of words per page. Each fluency reader has been written so that these elements are most appropriate for the level of the children reading them. Ranging in number from 45 readers in kindergarten to 105 readers in third grade, each grade level provides ample opportunities for every child to practice fluency at the appropriate reading level. Repeated exposure to high-frequency words at an appropriate level allows children to be successful and gives them the confidence necessary to achieve fluency. A specific section of each homework page is also devoted to daily practice of high-frequency words. Fluency masters are provided for children who need more exposure to high-frequency words. These materials combine to give children the support they need in order to learn to read for meaning and with expression.

Research Support for Vocabulary Development

Vocabulary Development

Many researchers have acknowledged that most vocabulary words are learned indirectly, through encounters with oral and written language. White, Graves, and Slater (1990) suggested a relationship between reading ability and potential for increasing vocabulary: Children who read well are apt to read more frequently and to read more challenging material, thus bettering their chances to increase vocabulary. In contrast, many poor readers are exposed to less text and to text that is much too difficult (Cunningham & Stanovich, 1998). Other researchers have found that the most effective vocabulary-teaching methods exposed children more than once or twice to

words being learned (Armbruster, Lehr, & Osborn, 2001; Stahl & Fairbanks, 1986). Nagy and Scott (2000) concluded that the meanings of most words with more than one morpheme are predictable on the basis of the meanings of their parts. A deep understanding of words' structure contributes to success in reading comprehension. For ELL students and for native speakers, students' understanding of morphology—the structure of words—was found to be a better predictor of their comprehension than their level of vocabulary knowledge (Kieffer & Lesaux, 2007).

How Saxon Addresses the Research

Saxon Phonics and Spelling K–3 lays a solid foundation in phonics and fluency so that children are better able to enhance their vocabularies through independent reading. Research shows that phonics instruction makes children better readers and that better and more frequent readers have more extensive vocabularies. Saxon's reading and spelling word lists contain hundreds of decodable words and sight words, all of which are incorporated in lessons or student reading during the year. The inclusion of high-frequency words in the program is informed by the Dolch high frequency word list. *Saxon Phonics and Spelling K–3* focuses on concepts such as morphemes, suffixes and prefixes, allowing children to better assimilate into their vocabulary those words that are similar to words they have already learned.

Research Support for Comprehension

Comprehension

According to the Partnership for Reading (2002), systematic and explicit phonics instruction significantly improves children's reading comprehension. When children are able to decode automatically, they can concentrate on the meaning of text (Pearson, 1993). Systematic phonics instruction increases accuracy in decoding and word-recognition skills, which in turn facilitates comprehension. Lyon (2001) acknowledged that the fundamental purpose of reading is to derive meaning from print but also stated that the key to comprehension starts with the rapid and accurate reading of words. The RAND Reading Study Group found that "reading comprehension builds on successful initial reading instruction" and that "children who can read words accurately and rapidly have a good foundation for progressing well in comprehension" (Snow et al., 2001).

How Saxon Addresses the Research

Saxon Phonics and Spelling K–3 provides children with the skills and practice they need to become fluent readers, thus opening the door to increased comprehension. Saxon lessons include instruction in print awareness and previews of story vocabulary to prepare children to comprehend what they read. Fluency is cultivated through explicit, systematic practice of high-frequency words, and as children achieve or increase fluency, they are better able to read for understanding. Decodable student readers and fluency readers include comprehension questions so that parents and teachers can determine whether children understand the stories they are reading. An annotated bibliography that includes award-winning children's literature helps teachers find read-aloud material to accompany the lessons and improve children's oral and listening comprehension. *Saxon Phonics and Spelling K–3* provides a wealth of reading opportunities and a foundation in phonemic awareness, phonics and fluency that is critical to comprehension.

Conclusion

The basic pillars of instruction used in *Saxon Phonics and Spelling K-3* have long been shown to be effective. The Saxon pedagogy and its instructional methods are sound, supported by a variety of scientifically based foundational research studies; independent, program efficacy studies; and documented test-score increases. *Saxon Phonics and Spelling K–3* provides incremental instruction, continual practice, and cumulative assessment—all of which are distributed throughout the school year and across grade levels. This unique approach is highly effective with students of varying ability levels and allows students to gain *and retain* critical reading skills essential for life-long learning. For further demonstrations of the effectiveness of *Saxon Phonics and Spelling K–3*, please call Customer Service at (800) 284-7019 to receive a copy of the *Saxon Report Card,* a sample of test scores and success stories gathered from Saxon classrooms throughout the United States.

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