RESEARCH
FOUNDATIONS:

EVIDENCE AND EFFICACY
FOR STUDENTS WITH DISABILITIES
AND ENGLISH LEARNERS

SYSTEM 44

THE HMH RESEARCH
MISSION
STATEMENT

Houghton Mifflin Harcourt® (HMH®) is committed to developing innovative educational programs and professional services that are grounded in learning science evidence and efficacy. We collaborate with school districts and third-party research organizations to conduct research that provides information to help improve educational outcomes for students, teachers, and leaders at the classroom, school, and district levels. We believe strongly in a mixed-methods approach to our research, an approach that provides meaningful and contextualized information and results.

TABLE OF
CONTENTS

AUTHOR LETTER

Dr. Marilyn Jager Adams

There is a great need for all students to develop the capacity to read, comprehend, and respond to more complex texts—the sorts of texts they will face in college, the workplace, and their day-to-day responsibilities and opportunities beyond high school. Their lives depend on it. By raising the bar, rigorous standards force us to reexamine expectations and lessons to which we have become accustomed. They force us to ask what else we can and should do to better assist our students. This is the challenge before us, and it is a critical one.

Toward meeting this challenge, it has been my great pleasure to work with the Intervention Solutions Group in bringing the findings of seminal theory and empirical research to the aid of struggling students as we have revised and expanded *System 44*®. *System 44* Next Generation, launched in 2013, focuses on providing explicit instruction in phonics, reading comprehension, and writing for the most challenged readers. It is designed to help these students acquire decoding automaticity alongside the linguistic strengths and metacognitive skills on which their literacy growth depends.

To date, *System 44* has been implemented in thousands of schools across the United States. The profiles in this book are part of a larger body of evidence indicating that *System 44* can improve the learning trajectories of even our most challenged readers. Moving forward, we will continue to build off this positive momentum toward ensuring that the literacy levels of all students are ready for college, career, and life upon high school graduation.

Sincerely,

Marilyn Jager Adams

SYSTEM 44 WORKS

Over **6.4** million

Students with disabilities ages 6 through 21

OSEP, 2008

Over **4.85** million

English learners in Grades K–12

MPI, 2015

8 Years of CASE Endorsement

In two Gold Standard studies, *System 44* students show significantly greater gains **over the control** group on numerous standardized reading assessments.

10% More Reach Proficiency

6 Points More Percentile Gain

11 Points More Percentile Gain

13 Points More Percentile Gain

CST ELA California Standards Test of English Language Arts

TOWRE Sight Word Efficiency

CTOPP Elision Phonemic Sensitivity

Reading Inventory Reading Comprehension

# of Expulsions / **Expulsion Costs**

$342,000
$224,000
$241,900
$153,400

2006 | 2010 | 2011 | 2012

# of Suspension Days / **Suspension Costs**

$146,430
$99,120
$62,580

2010 | 2011 | 2012
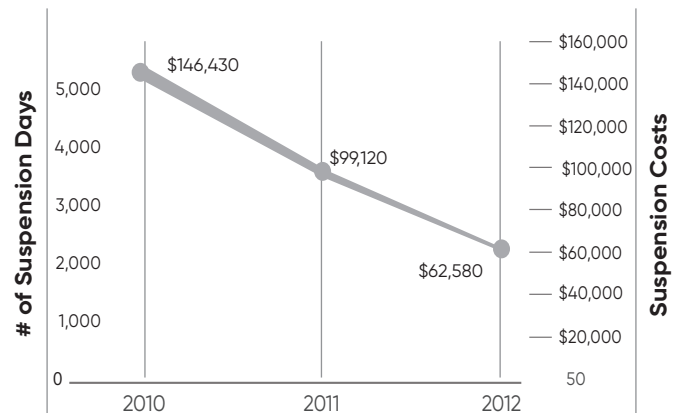
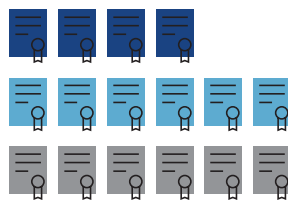## NUMBER OF STUDIES BY **STUDENT GROUP***

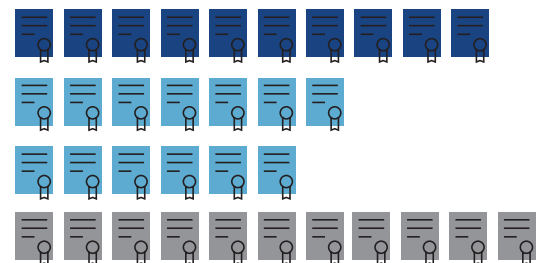● Elementary ● Middle School ● High School

Economically Disadvantaged

English Learners

Ethnicity

Students With Disabilities

System 44 and *READ 180* provide a solid return on investment for Napa Valley Unified School District, CA.

*More results can be found in the *System 44* Compendium and online at **hmhco.com**/**System44.**

INTRODUCTION

ADVANCES IN INSTRUCTION FOR STUDENTS WITH DISABILITIES AND ENGLISH LEARNERS

Students with disabilities and English learners (ELs) are two student groups that face numerous challenges as they learn the reading and writing skills necessary for success in school, college, and career. It is critically important that these students are supported by their schools, their teachers, and the reading and writing programs that are implemented in their classrooms.

According to the Institute of Education Sciences, National Center for Education Statistics (2015), over 6.4 million students in public schools receive services through the Individuals with Disabilities Education Act (IDEA), including over 2 million students with specific learning disabilities and almost half a million students with autism. The number of students with all disabilities, as well as the number of students with specific learning disabilities, has steadily decreased since 2004–2005 while the number of students diagnosed with autism has steadily increased since 2000–2001. The latest data suggest that the number of ELs has remained relatively consistent since 2008–2009. Population estimates range in size from 4.4 (National Center for Education Statistics, 2015) to 4.85 (Migration Policy Institute, 2015a) million students for the 2012–2013 school year with approximately 71%–80% reported as Spanish speakers (MPI, 2015b). Approximately 80% of the millions of students who are ELs speak Spanish as their primary language. While we describe these special populations of students as a group, we know that the learning approaches to support them need to be individualized.

One explanation for the reduction in the number of students with disabilities and the consistency in the number of ELs who receive services is the knowledge that has been accumulated on how best to meet the needs of these students. This knowledge has led to the development of instructional programs such as *System 44* that address the varied needs of struggling readers including students with disabilities and ELs. Decades of research studies have proven to educators that learning to read skillfully is a complex process that begins with foundational literacy skills. Only once these foundational skills have been strategically and automatically mastered can skilled reading with comprehension occur.

As these studies have consistently shown, and has been demonstrated in the classroom, students' awareness and mastery of the correspondence between letters and sounds determines their ability to read single words with speed and accuracy, which in turn predicts their ability to read and comprehend texts (Adams & Bruck, 1995; Scarborough, 2002; Wagner, 2008). Programs that have a clear approach to explicit and systematic instruction in foundational literacy skills, such as phonemic awareness and decoding skills, fluency in word recognition and text processing, reading comprehension strategies, oral language vocabulary, spelling, and writing skills, combined with frequent engagement with level-appropriate text, have been proven effective for teaching students to read skillfully. Once students master the skills needed to decode text, they can move forward to comprehending the increasingly complex texts needed to meet the demands of rigorous state standards, and more importantly, to set themselves on a pathway for success in college, career, and life (Adams, 1990; Moats, 2012; National Early Literacy Panel, 2008).

With this knowledge at the forefront of *System 44*'s development, we have designed a program that meets the needs of our most challenged readers, including students with disabilities and ELs. The *System 44 Evidence and Efficacy for Students with Disabilities and English Learners* paper takes a deeper dive into the research base of *System 44*, and the program components that reflect this knowledge for these special student populations. This paper can be used as a companion to the *System 44 Next Generation Research Foundation paper.*

HOW *SYSTEM 44* RAISES THE BAR

With *System 44* Next Generation, our most challenged readers and their teachers have everything they need to develop the literacy skills needed to meet and exceed rigorous state standards. Guided by Judith Birsh's book, *Multisensory Teaching of Basic Language Skills* (2000), *System 44* provides struggling readers with a multisensory structured language program that allows them to master the foundational literacy skills that lead to comprehension. The central goal of the program is to ensure that each student masters the system of 44 sounds and 26 letters that constitute the English language, allowing them to become fluent and confident readers who can comprehend increasingly more complex texts.

Since its inception, *System 44* has relied on the research-based design of Dr. Ted Hasselbring at Vanderbilt University and his work on adaptive educational technology. *System 44* leverages the power of research-based instructional practices and individualized learning technology driven by the FASTT (Fluency and Automaticity through Systematic Teaching with Technology) algorithm that Dr. Hasselbring helped to pioneer with *READ 180*®. *System 44* helps teachers deliver the precise foundational literacy instruction each student needs to achieve mastery. Since its launch in 2008, *System 44* has earned a history of success, including an endorsement by the Council of Administrators of Special Education (CASE) and countless successes across varying implementations nationwide. *System 44* has been proven to raise reading achievement for the most challenged student populations, including students with disabilities and English learners. The Efficacy Studies in this document highlight several of the studies contributing to *System 44*'s evidence and efficacy base in support of students with disabilities and English learners. For more *System 44* efficacy studies, see the *System 44* Compendium.

Instruction in *System 44* blends daily opportunities for teacher-led instruction, individualized learning technology, and independent reading. The components of the program that are outlined to the right were designed explicitly to help educators meet the needs of students with disabilities and ELs and the demands of rigorous state standards.

Deep Dive Seminars & Cadre Meetings

Professional Learning

Coaching

Community

SYSTEM 44

Dashboards

Implementation Training

The *System 44* Student Software delivers a comprehensive personalized learning path, with features that include:

- A **Dictation activity** that provides students with the opportunity to apply decoding skills to writing while building fluency

- A **context activity in the Success Zone** that allows students to demonstrate comprehension with independence

- A writing component that provides students with scaffolded practice in writing summaries tied to content in the Software, **helping students build comprehension and writing fluency**

- Student Dashboards that allow students to explore and celebrate individual progress through the program

The *44Book* provides teachers with the comprehensive tools and support needed to successfully raise reading achievement in their classroom. The *44Book* includes:

- Readings of **increasing text complexity** that cover a broad range of content-area topics, supporting the development of academic vocabulary and knowledge

- **Text-based questioning** to build comprehension

- Stretch texts with Lexile® (L) measures up to 1200L designed for **read-alouds** that expose students to complex, grade-level text

- **Instructional routines such as summarizing and collaborative discussions** that accompany each lesson

- **Writing instruction** that focuses on the skills required by rigorous standards and that is scaffolded to move students toward independence

- **Performance-based assessments** in the form of short research projects that ask students to synthesize and present their learning

In addition, the *44Book Teacher's Edition* provides a clear path for daily, explicit instruction in phonics, reading, and writing skills. The *System 44* Student Library provides students with daily opportunities for modeled and independent reading of high-quality fiction and nonfiction. Each library includes:

- A range of leveled, age-appropriate titles ranging from 100L to 450L

- **Texts that target decoding skills and strategies** to promote comprehension and build vocabulary and content-area knowledge

- Three formats designed to support anytime/anywhere reading: **Paperbacks, Audiobooks, and eBooks**

- Resources that provide **scaffolded supports, including Comprehension, QuickWrites, Discussion Questions, and *Reading Counts!*® quizzes** for each title

The Teacher Dashboard increases the capacity of effective teachers, providing them with comprehensive supports for effective teaching and data-driven instruction, including:

- **Data snapshots that provide at-a-glance views of implementation and performance data** and allow teachers to drive differentiated instruction

- The **Groupinator,® which aggregates student performance data** and applies it to a proprietary algorithm, automatically generating small groups to make differentiating instruction easier for teachers

- Notifications that teachers can opt in to receive when performance or implementation factors require their attention

- The **Report Scheduler** which allows teachers to schedule best practice reports

- Embedded Professional Development resources such as **on-demand videos**

- Access to the **Interactive Teaching System (ITS)**

- The Individual Learning Plan (ILP), which gives teachers a **snapshot of how students are meeting their academic and behavioral goals**

Through the Teacher Dashboard, teachers can access the digital *Resources for Differentiated Instruction* (RDI) book, which is a comprehensive guide that provides teachers with a wide array of resources to deliver differentiated instruction. **The RDI includes a collection of targeted phonics and word analysis lessons, plus instructional routines, aligned to the scope and sequence of phonics instruction.** Additionally, the RDI presents research, instructional best practices, and tools for the successful implementation of Multi-tiered System of Supports (MTSS), which include both a Response to Intervention (RTI) framework and a Positive Behavior Intervention System (PBIS).

The Leadership Dashboard provides school and district leaders with transparent visibility into *System 44* implementation metrics, and includes the following:

- Data snapshots to view school- or district-wide performance

- Data drill-down into individual school-, class-, and student-level data

- Notifications and the Report Scheduler that allow leaders to receive regular notifications on program data

The **bilingual** *System 44* **Family Portal, available in English and Spanish**, supports the diversity of family members and caregivers invested in the success of *System 44* students. The Family Portal includes a wide variety of information and resources to support phonics instruction at home for all families, including students with disabilities and English learners. *System 44* is proven to help students master the foundational reading skills required to meet and exceed rigorous standards and includes everything educators need to teach foundational reading.

"*System 44* utilizes computer software to help struggling readers like me decode and interpret words, phrases, and sentences. This class, along with my parents and tutors, helped me improve my Lexile score several hundred points."

— Danny, Grade 9, Manhasset, NY

A HISTORY OF RESEARCH

Advances in Special Education and English Learner Instruction

1985

EARLY RESEARCH

Partially funded by a grant from the **U.S. Department of Education's Office of Special Education programs**, research by Dr. Ted Hasselbring of Peabody College, Vanderbilt University, leads to a breakthrough prototype for software that uses individual student performance data to differentiate reading instruction.

1994–1996

Dr. Hasselbring joins forces with **Dr. Janet Allen of the University of Central Florida** and with Florida's Orange County public school system to create the Orange County Literacy Project for its lowest-performing students. The project's instructional model, rooted in research-proven literacy practices, becomes the basis of the *READ 180* Instructional Model and later the *System 44* Instructional Model.

1997

We enter into collaboration with Vanderbilt University to replicate the best practices of their research in a published program. *READ 180* **adopts the Lexile® Framework for Reading developed by Dr. Jack Stenner of MetaMetrics®, Inc.**, as its leveling system. The Framework provides a common metric for measuring text difficulty and student reading level. The Lexile Framework is also applied to the development of *System 44*.

2003

Dr. Sally Shaywitz comes out with the breakthrough book ***Overcoming Dyslexia***, where she states that the most successful programs for students with dyslexia emphasize the same core elements: practice with manipulating phonemes, building vocabulary, increasing comprehension, and improving the fluency of reading. The development of *System 44* incorporates the best practices noted in the book.

2007–2008

DEVELOPMENT

Dr. Marilyn Jager Adams, author of *Learning to Read*, leads the development of **System 44**, a breakthrough foundational system combining the very best thinking on **research-based phonemic awareness and phonics instruction** for older students with the power of state-of-the-art adaptive technology. *System 44* is reviewed by the Center for Applied Special Technologies (CAST) to ensure maximum access to an inclusive and effective learning environment for all learners, including students with disabilities.

Dr. Julie Washington, a leading authority on **articulation and standard classroom English**, builds instructional support for students who speak a community dialect and struggle with academic English.

2008

PRODUCT LAUNCH

System 44 is launched and implemented in almost 2,800 classrooms within the first six months as a Tier lll solution.

HMH *Phonics Inventory®*, the universal screener aligned with *System 44*, meets the stringent criteria for review by the **National Center on Response to Intervention (RTI)**.

2011

VALIDATION AND CONTINUED IMPROVEMENT

The Council of Administrators of Special Education (CASE) endorses *System 44* for use with special education students.

2013

A randomized controlled study (RCT) study in Saginaw, MI, reveals that *System 44* has significant effects for students with learning disabilities. **A review of the study by the National Center on Intensive Intervention (NCII) rated its validity highly**, thus establishing that the findings convincingly add to the body of evidence on the efficacy of *System 44* as a literacy intervention for the most challenged readers.

PRODUCT LAUNCH

A new edition of *System 44*, the proven foundational reading program designed to get the most struggling readers on the path to meeting rigorous new standards, is launched. To better support students, *System 44* now includes explicit instruction in reading complex text and evidence-based writing.

2014

READ 180 and *System 44* provide a solid return on investment (ROI) for **Napa Valley Unified School District** by significantly improving student outcomes on the CST ELA and the CELDT, by lowering referral rates into special education, and by decreasing suspension and expulsion counts.

The ***Reading Inventory*®** is released with two subtests, a foundational reading assessment and a reading comprehension assessment, including more coverage to more accurately assess each student's instructional needs.

System 44 for iPad® is launched.

2015

System 44 is re-endorsed by CASE for use with special education students.

Houghton Mifflin Harcourt acquires *System 44* and *READ 180.*

2017

HMH releases the publication, "An Alignment of *System 44* with the International Dyslexia Association's 'Effective Reading Instruction for Students with Dyslexia.'"

2018–2019

HMH partners with the Neurocognition of Language Lab at Teachers College, Columbia University, to examine the impact of *System 44* on students' brain wave patterns as measured by the neuroimaging method called electroencephalography (EEG).

HMH partners with the Armstrong School in California, a private school designed to provide research-based instruction for students with dyslexia, to implement *System 44* and *READ 180* Universal.

2019

System 44 is re-endorsed by CASE for use with special education students.

An RCT study in Murrieta Valley Unified School District, CA, reveals positive impacts of *System 44*. A review of the study by the NCII rated its validity highly, adding to the body of evidence for *System 44*.

New *System 44* product control features allow for accuracy-only scoring within the software app, along with manual placement by teachers within the software scope and sequence.

A new interchangeable Universal Literacy License for *READ 180* Universal and *System 44* Next Generation is implemented.

EVIDENCE BASE

Effective adolescent literacy interventions must provide systematic support for differentiating instruction in order to ensure that all struggling readers receive the support they need to achieve success. *System 44* Next Generation includes extensive resources, designed to fit within a Multi-tiered System of Supports (MTSS) framework. Within an MTSS framework, teachers use data to inform instruction from both a Response to Intervention (RTI) and Positive Behavioral Interventions and Supports (PBIS) perspective to provide targeted academic instruction and behavioral support to students with special needs, including students with disabilities and English learners.

EVIDENCE BASE

SUPPORTING STUDENTS WITH SPECIAL NEEDS

STUDENTS WITH DISABILITIES

Reading is complex, and struggling readers may face many challenges, including mastering foundational reading skills. A variety of factors can contribute to difficulties with foundational reading skills among older students. For example, researchers have found associations among reading deficits and poverty (Chall & Jacobs, 2003; Lee, Grigg, & Donahue, 2007), parental reading level (Honig, Diamond, & Gutlohn, 2000), and/or biological, cognitive, neurological, or psychological learning issues. Students can also become struggling readers through lack of practice or if they move between states with differing standards and grade-level expectations (Stanovich, 1986).

Instead of focusing solely on decoding text, researchers have begun to realize that comprehension difficulties can come from a wide range of language and thinking challenges (Williams, 2015; Swanson and Haskyn, 1998). While students with disabilities may be able to comprehend what they are reading, they are challenged due to inadequate strategic processing capabilities (Williams, 2015).

There has been a call for more instruction in higher-level reading skills for adolescents and for professional development for teachers due to the realities of student reading difficulties and teacher lack of preparation. This has raised awareness of the support that needs to be given to struggling readers and the role that teachers play in working toward higher levels of literacy among students (Kamil et al., 2008).

Research shows that successful reading interventions for older students with special needs match students with reading materials at an appropriate level of difficulty for the particular student (Vaughn & Denton, 2008). When students are paired with texts too far above their reading level, it is difficult for them to make maximum progress (Shanahan, 2008).

All struggling readers, particularly students with learning disabilities, require time to **read and respond to text with modeling and corrective feedback** (Swanson, Wexler, & Vaughn, 2009; Vaughn & Roberts, 2007).

Immediate, **computer-assisted corrective feedback** accompanied by answer-until-correct procedures (Epstein, Cook, & Dihoff, 2005) or more practice (Hall, Hughes, & Filbert, 2000) have been found to be effective with students with disabilities.

Motivation is a strong predictor of reading comprehension in students with disabilities (Heo, 2007; Sideridis, Mouzaki, Simos, & Protopapas, 2006). Captioned video and television programs can help deaf students improve their motivation, vocabulary, and reading comprehension (Jackson, 2003; Kalyanpur & Kirmani, 2005). It further deepens understanding of what is taught in the classroom (Hasselbring & Glaser, 2000).

Research has revealed that **articulation exercises** and the **visual reinforcement** of seeing a speaker's face can help hearing-challenged students, autistic learners, and other language learners to perceive and generate the sounds of English (Bosseler & Massaro, 2003).

Adjusting the font, size, and color of the text can help address the needs of students with visual impairment (Hasselbring & Glaser, 2000).

HOW *SYSTEM 44* DELIVERS

System 44 uses **adaptive technology to deliver a personalized learning progression** via five instructional Strands. Students can learn at their own pace as they move through The Code, Word Strategies, Sight Words, Success, and the new Writing Strand. *System 44* is aligned with the core principles of **Universal Design for Learning (UDL)**, a set of principles that promotes the creation of flexible goals, methods, materials, and assessments to accommodate all learners' differences. Harnessing the power of FASTT technology, the Software provides instruction and practice in each of the five learning Strands according to each student's ability, adapting along the way. Students have the ability to **fast-track through topics** in which they demonstrate mastery, or receive new material when additional practice is needed.

Differentiated and individualized instruction are achieved by the integration of multiple assessments, multiple entry points, adaptive computer technology, and targeted instructional materials and strategies. In addition to the individualized instruction students receive through the Software, teachers have access to various resources to deliver targeted instruction as well. Through the Teacher Dashboard, the new algorithmic Groupinator automatically recommends skills and strategies for each group based on student assessment data. Teachers can thus create learning environments for multiple purposes to meet the needs of individual students.

The *44Book* ensures all *System 44* **students receive direct instruction in phonics, decoding, reading, and writing skills** as outlined by the new rigorous state standards. With enough content to cover a year of instruction, the *44Book*'s eight Modules expose students to higher-level text and high-leverage vocabulary along with daily opportunities for reading, writing, and speaking. Composed of 80% nonfiction texts, the texts are highly engaging and age appropriate for older struggling readers. The nonfiction texts include Stretch texts designed to expose these students to grade-level text. The new *44Book* provides a clear instructional path for teachers in Small-Group differentiated instruction, including instruction in phonics, word study, comprehension, writing, and performance-based assessments. In addition, *Resources for Differentiated Instruction* **(RDI) provides word-based routines for teachers to use to support older, struggling learners.** For example, the suffix, prefix, and roots routines are helpful in teaching challenged readers how to unlock the meaning of grade-level academic vocabulary.

In order to engage and motivate older struggling readers, *System 44* Student Library titles feature high-interest, age-appropriate topics and offer students a wide array of choice. Readings in all *System 44* print materials reflect ethnic, cultural, and linguistic diversity and focus on engaging topics, such as careers, music, heroes, relationships, health, and family. **This wide range of Library titles ensures that students have the opportunity to read about topics that are relevant to their interests and personal experiences.** Audiobooks and eBooks offer challenged readers the opportunity to develop good reading skills and habits while enjoying natural voice narrations of the *System 44* Next Generation Student Library books.
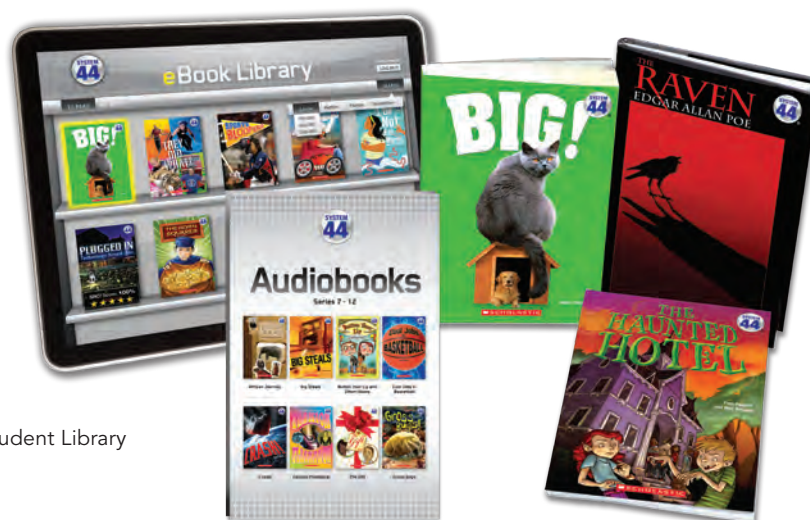
System 44 Student Library

STUDENTS WITH SPECIFIC LEARNING DISABILITIES INCLUDING DYSLEXIA AND AUTISM

Interventions for students with specific learning disabilities should be systematic, explicit, and multisensory (IDA, 2012). Many individuals with specific learning disabilities require one-on-one help so that they can move forward at their own pace. In addition, students with specific learning disabilities, especially dyslexia, often need a great deal of structured practice with print and immediate, corrective feedback to develop automatic word recognition skills (IDA, 2012).

According to Shaywitz (2003), effective intervention programs for students with reading disabilities including dyslexia: 1) **provide systematic, direct instruction in phonemic awareness and phonics**; 2) teach students to apply these skills to reading and writing; 3) **provide fluency training**; and 4) include rich experiences listening to and using oral language.

For all students, especially those with specific reading difficulties, speech/sound blending supports word recognition, spelling supports vocabulary, understanding of morphology supports word recognition, and oral language capacities are the underpinning for written language (Moats, 2012). **Additionally, for students with dyslexia, practice with handwriting, spelling, and sentence composition support higher level composition** (Berninger & Wolf, 2009).

Interventions that focus on phonemic awareness and phonics for children with developmental dyslexia have resulted in increased brain activity in areas that are associated with converting graphemes to phonemes and access to the orthographic lexicon (Hasko et al., 2014). This suggests that these interventions have the potential to strengthen the connections in the brain between letters and sounds that are crucial to reading development.

According to the National Institutes of Mental Health (2009), **an effective treatment program for children with autism should build on the child's interests, offer a predictable schedule, teach tasks as a series of simple steps, actively engage the child's attention in highly structured activities, and provide regular reinforcement of behavior.**

HOW *SYSTEM 44* DELIVERS

Throughout *System 44*, program materials reflect a consideration for the needs of students with disabilities, including those with specific learning disabilities. **Endorsed by the Council of Administrators of Special Education (CASE)**, *System 44* supports readers who have unique learning challenges and those who have been identified as in need of special education services.

The **predictable structure and consistency of the System 44 instructional model is reassuring to students with autism**, allowing them to focus on learning and minimize anxious or disruptive behavior. The timed rotations in the model specifically minimize anxiety around transitions, which can be particularly stressful to students with autism. With *System 44*, students are reassured by knowing that each class period will follow a specific structure. This allows them to concentrate on the lesson content, and comfortably transition from one rotation to another.

While all learners can benefit from the program's diagnostic instruction in phonics, multiple entry points, and opportunities for Fast-Track acceleration in the Software, **students with specific learning disabilities will particularly benefit from the Individualized Education Programs (IEP) supports.** With *System 44*, teachers and parents can use point-of-use data and reports, such as the Individual Learning Plan, to measure student progress toward annual academic and behavioral IEP goals. Furthermore, multiple print and digital resources, including customizable rubrics, support the implementation of academic and behavioral interventions **within an MTSS or PBIS framework**.

The *System 44* Software aligns with the core principles of **Universal Design for Learning (UDL)**, providing multiple means of presentation, expression, and engagement, with media that includes closed-captioning for hearing impaired students. Multisensory instructional resources, including visual, auditory, tactile, and kinesthetic resources, help teachers differentiate instruction for students with specific learning disabilities. In addition, closed-captioning is available for all Success videos.

The *System 44* Library **books feature high-interest, age-appropriate topics** and offer students a wide array of choices. *System 44* Library materials are high interest and engaging for even the most struggling readers. Like other students their age, students with autism want to be reading about the same topics as their peers. With the independent reading books, students with autism of all reading levels are able to access text that reinforces their interests and builds motivation to read.

To expand upon the existing supports for students with specific learning disabilities, the *System 44* Family Portal provides ample **resources for the parents and caregivers** of these students. A wide variety of information and resources, such as IEP supports, helps improve the programmatic outcomes of students with specific learning disabilities. To learn more, visit hmhco.com/System44 and click on the Family Portal button.

System 44 Teacher Dashboard

ENGLISH LEARNERS

A recent review of best practices for "Teaching Academic Content and Literacy to English Learners in Elementary and Middle School" conducted by the Institute of Education Sciences resulted in four recommendations:

- Teach a set of **academic vocabulary** words intensively across several days using a variety of instructional activities.

- Integrate oral and written English instruction into content-area teaching.

- Provide regular, structured opportunities to develop **written language skills**.

- Deliver small-group instructional intervention to students struggling in areas of literacy and English development (Baker et al., 2014).

Struggling readers may include students who have difficulty mapping to standard English phonology, conventions, and syntax due to community, regional, cultural, or vernacular dialects (Craig & Washington, 2006; Labov, 2006) or differences between English and their primary language.

The research on effective instruction for English learners points to three important principles: generally effective practices are likely to be effective with English learners; **English learners require additional instructional supports**; and the home language can be used to promote academic development. Additionally, English learners need plenty of opportunities to develop proficiency in English (Goldenberg, 2013).

In a study of high-performing schools with large populations of English learners, four broad effective practices were identified as having the most significant positive correlation with high test scores: implementing a coherent, standards-based curriculum and instructional program; prioritizing student achievement; ensuring availability of instructional resources; and **using assessment data to improve student achievement and instruction** (Williams, Hakuta, Haertel, et al., 2007).

Teachers can accelerate the language proficiency of English learners by **explicitly teaching the conventions, vocabulary, and structures of academic language in specific domains** (Dutro & Kinsella, 2010). Many English learners need to acquire new phonemes or orthographic patterns as well as new matches between phonological segments and orthographic patterns (Durgunoglu, Nagy, & Hancin-Bhatt, 1993). Additionally, teaching vocabulary as it is used in specific genres prepares English learners to succeed with academic writing tasks (Schleppegrell, 1998).

Research shows that English learners' **reading comprehension improves when teachers activate and draw upon students' background knowledge** in relation to the story (Saunders, 1998; Ulanoff & Pucci, 1999). To ensure success for English learners, Coady et al. (2003) suggest texts that 1) are comprehensible; 2) are reader friendly; and 3) make links to students' prior knowledge and experience. English learners in particular benefit from **repeated reading** using both print texts and audiobooks (De la Colina, Parker, Hasbrouck, & Lara-Alecio, 2001).

Captioned video provides both visual and print contexts and has been shown to increase word recognition in English learners (National Center for Technology Innovation and Center for Implementing Technology in Education, 2010).

HOW *SYSTEM 44* DELIVERS

Throughout *System 44*, program materials reflect a consideration for the needs of English learners. All English learners can benefit from the program's diagnostic instruction in phonics that addresses students' individual needs, through the placement test, multiple entry points, and opportunities for Fast-Track acceleration in the Software. English learners will particularly benefit from the **vocabulary supports incorporated throughout the program, including images for over 2,000 words.** For words that are difficult to image, such as concept words and verbs, there are additional supports including sound effects and videos.

In the Success Strand, students begin by watching an **anchor video that builds background knowledge** and helps them to build mental models of text. Sound & Articulation videos help teachers model correct academic pronunciation of all sound spellings taught in the program. For Spanish speakers, home language supports allow students to click on any word during the Software instruction and receive a translation in Spanish.

English learners are able to apply and practice their learned skills in *System 44*'s decodable texts that provide frequent opportunities to experience success reading decodable and sight words in varied contexts. In the *44Book*, students benefit by watching anchor media at the beginning of each Module that helps build background knowledge of the content addressed in the Module. **Teachers also begin by frontloading academic vocabulary before engaging in the Module readings** that include the targeted words. The build in picture cues and context sentences in the Software and Decodable Digest, along with explicit vocabulary instruction in teacher-led lessons, are all designed to support English learners. Like native English speakers, English learners are able to apply and practice their learned skills with Audiobooks and independent reading books that are leveled so that students can experience frequent success with reading.

System 44 students are all unique and come from diverse families who require different kinds of supports as they accompany students on the path to college and career. The new *System 44* **Family Portal** contains a wide variety of information and resources for families, such as tips and videos to support phonics instruction at home for all students, including those who are English learners. All content on the Family Portal is available in Spanish and English, and this includes its resources, tips, and video excerpts.

System 44 Bilingual Family Portal or Espacio Familiar

TEACHING AS EMOTIONAL WORK

MINDSET AND SELF-EFFICACY

Students' **academic mindsets** play an important role in increasing engagement in learning, resiliency in the face of setbacks, and academic success (Farrington et al., 2012). Growth mindset is the belief that through effort and learning one can become good at something (Dweck, 2007).

Students are continually developing new capacities for thinking about how they learn, for considering multiple ideas, and for planning steps to carry out learning activities; however, because these capacities develop gradually and sporadically, most students still require ongoing, concrete, experiential learning in order to achieve (AMLE, 2010).

Research has identified patterns of cognitive-based and affective-based processes that are "set in motion" when a particular goal is adopted over the short or long term (Elliot & Dweck, 1988). **Setting clear goals and expectations increases motivation** by encouraging student involvement in and responsibility for their own learning (Ames, 1992; Bransford, Brown, & Cocking, 2000). Neuroscientific studies have shown that when students understand the goals

of their work, they are more likely to stay focused, self-monitor, and appreciate their own progress (Rose, Meyer, Strangman, & Rappolt, 2002).

Systematic instruction and practice helps students learn executive function skills such as setting goals, planning, organizing and prioritizing materials, managing time, being cognitively flexible, self-monitoring, and self-reflecting (Meltzer, 2007).

Higher-order cognitive skills, such as making inferences and planning and organizing information, help students comprehend more complex text and question types. As such, developing these higher-order skills is important to reading growth as students progress in school (Eason, Goldberg, Young, Geist, & Cutting, 2012).

Academic confidence comes from experiencing academic success daily (Pressley et al., 2006). By giving students ways to feel competent, it becomes more likely that they will learn what is necessary to be successful. In this way, students are able to experience the satisfaction of feeling competent (Sagor, 2003).

System 44 Student Dashboard

HOW *SYSTEM 44* DELIVERS

System 44 is **designed to foster and cultivate a growth mindset** in students. *System 44* NG contains both explicit and implicit growth mindset messaging and coaching for teachers and students. *System 44* includes personalized learning technology that is designed to increase students' intrinsic motivation, as well as their ability to read. *System 44* provides multiple opportunities for students to take ownership over their learning by setting goals and carefully tracking their mastery of lesson content. The mastery of foundational reading skills will build students' self-efficacy as they witness their growth and progress through *System 44*. The **Gradual Release Model**, used throughout the program, leads to ownership over learning as responsibility for performing a new skill is gradually transferred from teacher to student.

The **Student Dashboard allows students to track their overall progress** while motivating and supporting them to build executive function skills. Before beginning instruction, students are reminded of their current progress in the Software. From the Dashboard, students can explore items of interest, including their total number of words mastered and unlocked Success videos. The Dashboard's on-screen graphics encourage students to celebrate their successes and keep working toward their goals. Digital stickers enable students to track their progress on the My Software Tracking Log.

Once in the Software, **on-screen mentors** sustain the learner's engagement and interest by scaffolding, encouraging, and reinforcing his or her efforts, offering individualized corrective feedback according to the student's performance. In the Success Strand, students experience and celebrate their achievements by watching exciting videos that build mental models for reading. In Success, students also read high-interest, engaging passages that include the phonics exemplars, sight words, and multisyllabic words they have been studying.

System 44 leverages the power of technology to motivate students and provide structured engagement opportunities. Students who are not drawn to print media but voluntarily spend hours on the computer can use a tool they value to master skills they need. The on-screen host provides feedback and encouragement that is private, nonjudgmental, and respectful of students, and the endless patience of the computer cannot be overemphasized as students have opportunities to try, try again. Students who need extra support with a particular skill will encounter multiple opportunities to practice with fresh content.

The Student Digital Portfolio, accessible via SAM, now includes a **goal-setting tool** to help teachers and students evaluate progress toward yearly academic and behavioral goals. Tracking academic goals increases students' intrinsic motivation, classroom engagement, and the desire to continue to succeed. Students can also track and monitor their own progress through the use of additional print materials such as the *System 44* Self-Monitoring Chart, available as a resource.

System 44 Paperbacks, Audiobooks, eBooks, and Anchor Media are high-interest, age-appropriate, relevant to students' lives, and able to generate and sustain student interest. Throughout, **reading materials are carefully matched to students' current reading levels** as they progress through the program, ensuring that they experience success while being appropriately challenged. In addition to providing titles matched to students' current level of performance, each Module of the *44Book* includes a fiction and nonfiction Stretch text that exposes students to more challenging, grade-level text.

SOCIAL-EMOTIONAL LEARNING

Social and emotional learning (SEL) is the process by which students develop the knowledge, attitudes, and skills needed to understand and manage emotions, set and achieve goals, feel and show empathy for others, maintain positive relationships, and make responsible decisions (Collaborative for Academic, Social, and Emotional Learning (CASEL), 2014).

Five of the SEL core competencies are **self-awareness** (the ability to accurately recognize one's emotions and thoughts and their influence on behavior); **self-regulation** (managing one's emotions, thoughts, and behaviors effectively in different situations); **social awareness** (taking the perspective of and empathizing with others from diverse backgrounds and cultures while recognizing social and ethical norms for behavior); **relationship skills** (establishing and maintaining healthy and rewarding relationships with diverse individuals and groups); and **responsible decision making** (making constructive and respectful choices about personal behavior and social interactions based on ethical standards and the well-being of self and others) (CASEL, 2014).

Some of the **SEL factors that improve success in school** include having self-discipline, motivating one's self, managing stress, and organizing one's approach to learning more (Duckworth & Seligman, 2005). Self-regulation is another component of SEL that has been linked to academic achievement. Students who display this aspect of SEL try harder and have more persistence in the face of challenges (Aronson, 2002).

Three decades of research covered in a meta-analysis of 213 SEL programs found that **SEL interventions increased students' academic performance** by 11 percentile points over students who did not participate in SEL programs. The SEL programs also reduced aggression and emotional distress, increased helping behaviors, and improved positive attitudes toward one's self and others (Durlak et al., 2011).

Social-emotional learning in schools can be just as, if not even more, essential than academic learning for putting students on a path to positive developmental and life outcomes. A study conducted by the Center for Benefit-Cost Studies of Education at Columbia University's Teachers College found that **schools that invest in social-emotional learning programs experience a return on their investment** of $11 for every dollar spent. In addition to improvements in grades, attendance, and performance in core subjects, other benefits from social-emotional learning programs include reductions in aggression, substance abuse, delinquency, depression, and anxiety (Belfield et al., 2015).

Word Building in The Code Strand

HOW *SYSTEM 44* DELIVERS

The content organized within *System 44*'s Student Digital Portfolio reinforces and provides examples of the importance of managing emotions, setting and working to achieve goals, showing empathy for others, maintaining positive relationships, and making responsible decisions.

Within the Individualized Learning Technology, students read texts that inspire them to consider others through new perspectives. Additionally, the **messages and feedback delivered by the Individualized Learning Technology encourage students to persevere and achieve goals, make responsible decisions, regulate their thoughts and behaviors, manage stress, and organize their approach to learning.** The Student Dashboard allows students to set goals, regulate their progress, and motivate themselves toward achieving their goals.

The Independent Reading Library includes a number of **titles that promote healthy social and emotional traits.** The books help students build social awareness by encouraging them to feel and show empathy for others from diverse backgrounds and cultures. They also demonstrate positive relationship skills such as seeking out healthy and rewarding relationships with diverse individuals and responsible decision making such as making constructive and respectful choices about actions and behavior.

During the Getting Started Workshop at the beginning of the year, students set goals for each of their *System 44* classes, and they learn tips to help them achieve those goals. These goals are revisited throughout the school year to help the students become **self-motivated and self-regulated in achieving their goals.** Students gain social awareness through reading stories and watching videos about other people who have faced and overcome challenges. The activities that students complete during this workshop help them to become aware of their own thoughts and emotions and how they can control them, assist them in rewriting their own stories, and allow them to put themselves on a path to college and career success.
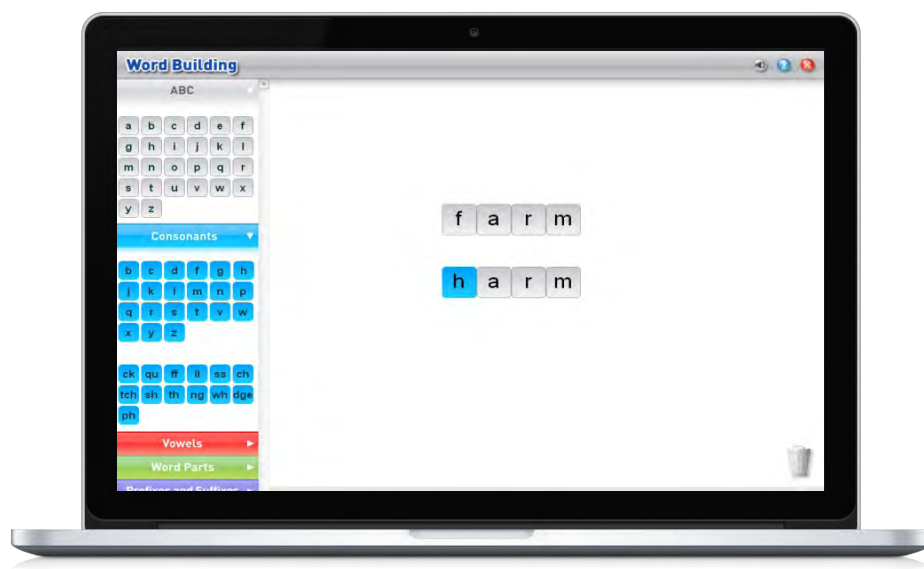
Interactive Teaching System (ITS) Word Building Tiles

FAMILY ENGAGEMENT

In order for a child to be successful in school, there are numerous critical roles that families play: supporters of learning, encouragers of perseverance and determination, models of educational practices, and advocates of appropriate school environments for their child. **Families need the opportunity to learn and grow along with their children and support the learning** and growth of their children in order for partnerships between families and schools to succeed (Mapp & Kuttner, 2014).

Schools and districts that successfully engage families in their children's learning are able to strike a balance between pushing families to support learning and pulling the families into the school community. These schools view families as partners in their children's education and provide a collaborative environment that builds relationships between educators and families. They have frameworks that encourage both learning at home and collaborative decision making (Henderson, Mapp, Johnson, & Davies, 2007).

Having books in the home helps establish a reading culture that continues from generation to generation within families and is independent of education and class. This creates an interest in and desire for books that will promote the skills and knowledge needed to foster both literacy and numeracy, thus leading to lifelong academic advantages (Evans et al., 2010).

Children whose parents have lots of books are nearly 20% more likely to finish college. **Books in the home are a stronger predictor of college graduation than the educational levels of the parents** (Evans et al., 2010).

It is very important that families and educators make a firm commitment to encourage adolescent students to **read outside of school** by finding ways to engage them with texts over the summer, as well as before and after school. Moreover, it is critical that we encourage them to make reading a part of their lifestyles (Alexander, 2014).

For a child to become a reader, time spent with parents or caregivers who engage with their children with books—whether through close readings or discussion of pictures—is what is most necessary. When children not only have access to books, but can share them with reading mentors who love books and reading, they are much more likely to thrive as readers (Heath, 1983; Bridges, 2014).

HOW *SYSTEM 44* DELIVERS

System 44 **provides resources to help families support students' learning** and connect with the *System 44* classroom. Families and caregivers can go online to the Family Portal to learn about *System 44* instruction and materials. The site includes tips for families about how to support their children's literacy achievement and offers links to additional resources and research to help caregivers understand the needs of struggling readers. In addition, the Family Portal provides a space for sharing success stories and experiences with teachers and other *System 44* families.

Each workshop includes strategies to support teachers in involving and engaging parents, including:

- Strategies for soliciting and hearing the concerns, hopes, needs, and insights of parents

- Suggestions for sharing expectations about parent involvement and asking parents about their expectations

- Channels for asking parents what they view as important in helping students succeed and adding those things to classroom practice

- **Frequent communications** with parents and families (via email, letters, and suggestions for school websites)

- Invitations for parent volunteers

- Information on supporting literacy work at home while helping students build independence

- Information on classroom assignments and the role of homework in reinforcing class discussion/learning

These strategies are available in the *Teacher's Edition*, throughout the texts, and through the Family Portal. Parent reports of student progress as well as letters to parents are available in multiple languages. Access to digital books helps students engage with their families over texts.
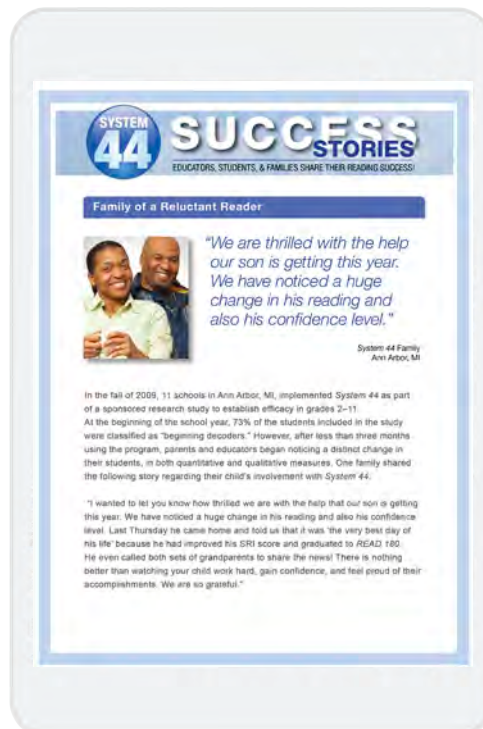
Success Stories on *System 44*

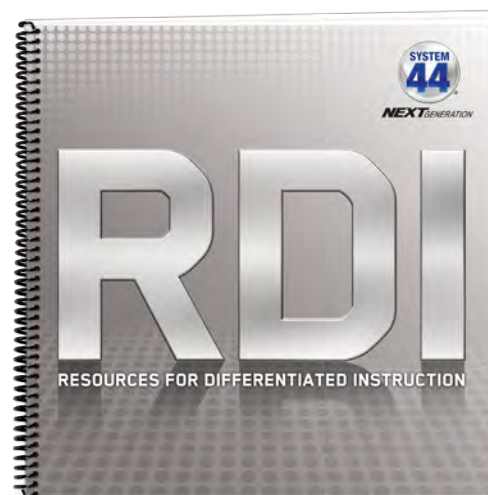# COMPREHENSIVE SUPPORTS FOR TEACHERS, ADMINISTRATORS, AND FAMILIES

Systematic monitoring of student progress and program implementation at the classroom, school, and district levels is critical to sustaining on-model implementation of an adolescent literacy intervention (Salinger, Moorthy, Toplitz, Jones, & Rosenthal, 2010).

To assess program efficacy and support effective instruction, teachers, principals, and district administrators need easy **access to real-time data at the classroom, school, and district levels** (Carnegie Council on Advancing Adolescent Literacy, 2010; U.S. Department of Education, 2010).

Although teachers and administrators have limited time to collect and analyze data, technology can help make assessment and monitoring more efficient (Bransford et al., 2000). The 2010 National Education Technology Plan (U.S. Department of Education, 2010) calls for a model of "connected teaching" in which **teachers leverage technology** to use data to inform instruction, as well as to connect to professional development resources and online learning communities.

A strong base of research evidence demonstrates that student achievement is positively impacted when schools, families, and communities partner to support student learning (Mapp & Henderson, 2002). Especially for groups of students considered at higher risk academically, research indicates that determined **parental engagement and community connectedness** play critical roles in bolstering academic achievement and protecting against potentially negative contextual influences (Maton, Hrabowski, & Greif, 1998).

In addition to teacher scaffolding of learning, **new technologies providing scaffolds and tools can be used to enhance learning**. According to Bransford, Brown, and Cocking (2000), "These designs use technologies to scaffold thinking and activity, much as training wheels allow young bike riders to practice cycling when they would fall without support. Like training wheels, computer scaffolding enables learners to do more advanced activities and to engage in more advanced thinking and problem solving than they could without such help"

Resources for Differentiated Instruction

HOW *SYSTEM 44* DELIVERS

System 44 provides **comprehensive supports for teachers, leaders, and families**, which in turn empowers them to better support our most challenged readers. *System 44*'s educator Dashboards empower leaders and build capacity of effective teachers by making the most important data transparent. In addition to freeing the teacher from many time-consuming tasks, *System 44* **provides the teacher with key, actionable data, which helps drive differentiated instruction.** The Software also continually collects data about student performance and provides continuous corrective feedback to the student, freeing the teacher to focus on targeted direct instruction.

With the new Dashboards, educators have **anytime/ anywhere access** to the most important implementation and student performance data to help drive instructional decision making and planning. The Teacher and Leadership Dashboards highlight key implementation metrics, such as time-on-task, which are key to overall programmatic results. With the Teacher Dashboard, data is made actionable with the algorithmic Groupinator, which assigns students to groups based on skill or progress in the Software. In addition to Data Snapshots and Notifications, the Teacher Dashboard provides additional **point-of-use professional development** resources such as short videos of model lessons and differentiated lessons tied to that day's instruction.

The *44Book Teacher's Edition* assists teachers in scaffolding direct instruction for students during Small-Group lessons. *Resources for Differentiated Instruction* (RDI) provide differentiated instruction lessons to reteach or reinforce skills that require additional attention according to student needs. *System 44* includes a suite of professional development resources. Teacher resources and instructional manuals support teachers in tailoring instruction and creating learning environments for multiple purposes. In-person training and ongoing coaching services are also available to maximize successful implementation.

In recognition of the importance of family and community engagement, the *System 44* Family Portal was developed to support the diversity of *System 44* students' family members and caregivers. The Family Portal, which is avail able in Spanish and English, includes a variety of information and resources to support phonics instruction at home for all families, including those with Special Education students and English learners. Visit hmhco.com/System44 and click on the Family Portal tab.

System 44 Teacher Dashboard
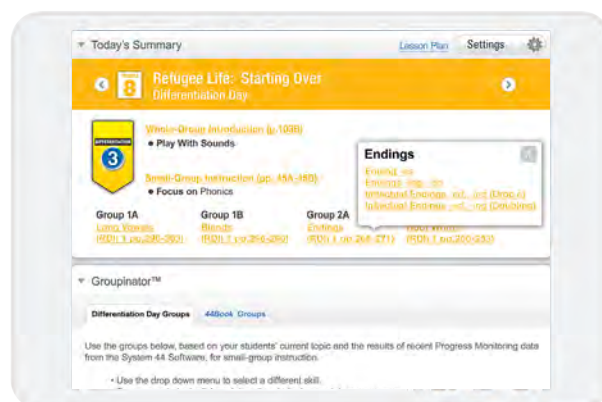
Groupinator

INDIVIDUALIZING INSTRUCTION TO MEET EACH CHILD'S NEEDS

DIFFERENTIATED INSTRUCTION

Differentiated instruction refers to tailoring instruction to meet the individual needs of the students. Some approaches educators can use to implement differentiated instruction are to individualize content, process products, and the learning environment based on student interests and skill sets. Using an ongoing assessment and flexible grouping helps make this a successful approach to instruction (Tomlinson, 2000).

Differentiated instruction meets students where they are—matching instruction to meet their different assessed needs. Research demonstrates that **differentiated instruction can significantly improve student achievement** (Allan & Goddard, 2010). For students with special needs, individually targeted instruction in reading skills can improve reading achievement, both in the targeted skill and in more generalized measures of literacy (Shanahan, 2008; Vaughn & Denton, 2008).

Poor readers in high school can improve .5 standard deviations in reading after receiving expert, intensive, closely monitored, theoretically sound, comprehensive, integrated instruction for 70 hours (Morris, Lovett, Wolf, Sevcik, Steinbach, Frijters, & Shapiro, 2012).

In a recent research synthesis by Wanzek and colleagues, strong evidence was found to support three instructional recommendations for students with reading difficulties in Grades 4 to 12: 1) **provide explicit vocabulary instruction;** 2) **use direct and explicit comprehension strategy instruction;** and 3) **provide struggling readers with intensive and individualized interventions**. From this finding, the authors recommended intensive intervention efforts for students with reading difficulties in Grades 4 through 12 who do not perform at or near grade level, and supplemental, small-group instruction for extended periods of time (Wanzek, Vaughn, Scammacca, Metz, Murray, Roberts, and Danielson, 2013).

Teachers who rely mostly on whole-group instruction do not adequately meet the individual needs of students who need extra literacy support. Instead, **teachers can use performance data to form small groups of students and teach lessons to target their specific skill needs.** Students with special needs particularly benefit from this type of targeted intensive instruction in small and flexible groups (Avalos, 2006).

Using **modern technology is advantageous** for developing flexible, supportive, and adjustable learning experiences for all students (Hitchcock & Stahl, 2003).

Modeled & Independent Reading
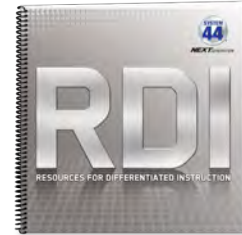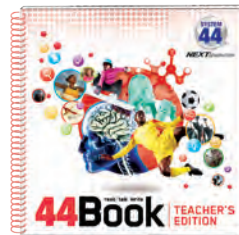
Teacher-Led Instruction

HOW *SYSTEM 44* DELIVERS

From its inception, **System 44 was designed to address the needs of students receiving additional education support.** Through adaptive technology, individualized instruction, and high-interest materials, *System 44*'s comprehensive system provides the differentiated instruction necessary to effectively support struggling readers, including students with disabilities and English learners.

Foundational reading skills instruction, powered by *System 44*, provides students with disabilities and ELs with systematic, direct instruction in phonics and phonemic awareness. Students are given the opportunity to practice and apply these skills, at their own level, to authentic reading and writing experiences. *System 44* provides students with the targeted practice that is necessary to achieve fluency. By mastering and becoming fluent in foundational reading skills, students with disabilities and English learners are able to make progress toward reading grade-level texts with comprehension.

Additional tools and resources, such as the **Educator Dashboards, help develop and maximize human capital**. Accessible anywhere an Internet connection is available, the new Teacher Dashboard highlights the most important student performance data and allows **teachers to use data to plan and differentiate instruction**. Teachers have access to daily customizable, standards-aligned lesson plans, and an at-a-glance summary of each day's lesson, thereby ensuring they are delivering targeted instruction at the class, group, and student levels. The Report Scheduler allows teachers to schedule best practice reports on a customizable schedule. In addition to using data snapshots to monitor class performance, teachers can also opt in to be notified when students meet specified performance thresholds or alerted when implementation factors like time-on-task require their attention.

Data, Assessment & Reporting
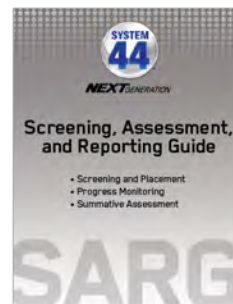
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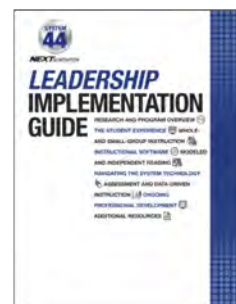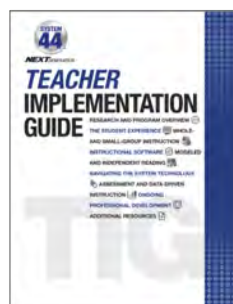
Professional Development

ASSESSMENT OF AND FOR LEARNING

Response to Intervention (RTI) is a multi-level system for maximizing student achievement by integrating ongoing assessment of student progress with increasingly intensive intervention (National Center on Response to Intervention, 2010). RTI organizes intervention into multiple tiers of increasingly intense interventions for those students not making adequate progress in Tier 1 (Feldman, 2009). Tier 2 and 3 interventions are intensified by increasing instructional time, decreasing group size, matching materials to students' levels, modifying presentation modes, and providing corrective feedback.

RTI supports progress monitoring for all students. In all tiers of intervention, students benefit from teachers' use of data to determine whether students are making the desired academic gains, and then whether they need modifications in their curricula, materials, or instruction (Fuchs, L. S., & Fuchs, D., 2007; Duffy, 2008). For special needs students, it is particularly important to use student performance assessment data to monitor progress in order to determine continuing instructional/remedial needs (National Joint Committee on Learning Disabilities, 2008).

A comprehensive assessment system integrates assessment and instruction, so that educators can continually use data to ensure they are meeting the needs of all students (National Center on Response to Intervention, 2010; Smith, 2010). Data collected through the assessment system should be used to 1) track student growth; 2) identify students who need more intensive intervention; and 3) assess the efficacy and implementation quality of instructional programs (National Center on Response to Intervention, 2010).

The value of in-depth classroom assessment comes from teachers' deep understanding of reading processes and instruction, thinking diagnostically, and using the information on an ongoing basis to inform instruction (Valencia & Riddle Buly, 2004).

Regular progress monitoring is vital to track student growth and determine which students need additional help or intervention (Fisher & Ivey, 2006; National Joint Committee on Learning Disabilities, 2008; Stecker, Fuchs, & Fuchs, 2005). Data collected through progress monitoring should provide a clear profile of students' strengths, weaknesses, and needs, and should be linked with resources for providing targeted follow-up instruction and intervention (Carnegie Council on Advancing Adolescent Literacy, 2010; Vaughn & Denton, 2008).

Shepherd and Marzola (2011) found that teachers who incorporated **formative assessments** into their lessons increased student reading achievement scores more than teachers who did not use formative assessments. While formative assessments are beneficial for all students, they are particularly helpful for struggling students as they highlight troublesome areas and provide guidance on what needs to be done to overcome them (Black & William, 2009).

When **students are included in monitoring their own progress**, they better understand their academic growth, gain motivation, and acquire a sense of ownership over their learning (Forster, 2009; Hupert & Heinze, 2006).

HOW *SYSTEM 44* DELIVERS

System 44 contains a suite of tools to **efficiently screen, place, and monitor students' progress** through the program. To ensure that students are placed in the program at the appropriate level, *System 44* includes the *Phonics Inventory*, a computerized, research-based, and validated assessment that should be administered to any student who receives a Lexile (L) measure between BR and 400L–600L on the *Reading Inventory*. In cases where elementary students score above 400L or secondary students score above 600L on the *Reading Inventory*, placement into *READ 180* is recommended. Used together, these resources help build capacity while maximizing student growth potential.

Using various discrimination tasks, the *Phonics Inventory* **determines whether or not the root cause of reading difficulty is an inability to decode, and identifies the appropriate point of entry for each student in the program's continuum of phonics instruction**. the *Phonics Inventory* also provides important information to teachers to inform direct, data-driven instruction in Small-Group differentiated rotations. the *Phonics Inventory* is highly reliable and validated against the Test of Word Reading Efficiency (TOWRE) and Woodcock-Johnson® III; it can be group

administered in approximately 10 minutes. Through ongoing assessments, the *Reading Inventory* and the *Phonics Inventory* can be used throughout the year to continue monitoring student progress and differentiating instruction as needed.

In SAM, educators can access nine **actionable reports about student progress**, such as the Screening and Placement and Student Mastery Report, to determine the response to intervention for each student. In addition, these reports link to relevant resources for differentiating instruction. The *System 44* Software helps teachers identify holes in students' knowledge so that these skills can be reinforced through direct instruction. In-person training services, teacher resources, and instructional manuals further support teachers as they continue to monitor student progress from placement through the end of the school year.

System 44's diagnostic assessment and reporting tools also provide students with **individualized pacing** and a **sense of ownership** over their learning. Fast-Track assessments in the Software check mastery of skills, accelerating students to the next appropriate instructional level to maximize success and instructional time.
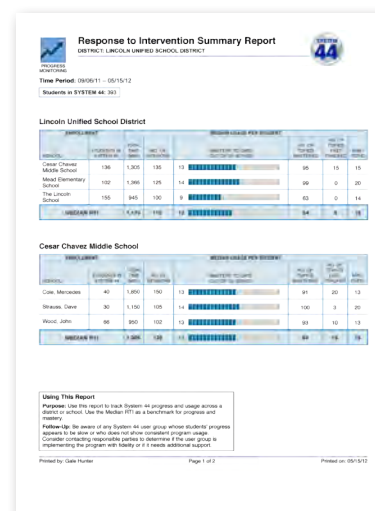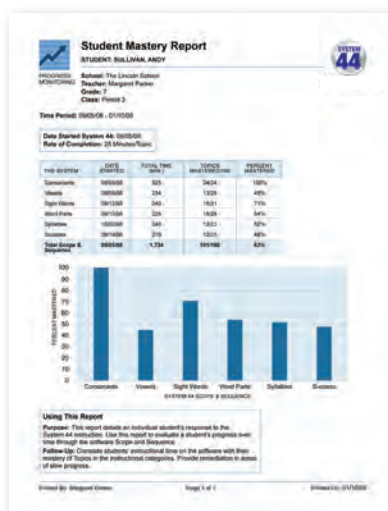
System 44 has over 10 actionable reports on student progress.

MULTI-TIERED SYSTEM OF SUPPORTS

The enactment of federal education legislation, such as the 2002 No Child Left Behind Act, the 2004 reauthorization of the **Individuals with Disabilities Education Act (IDEA)**, and the more recent focus on rigorous state standards, all point to the need for a model that encompasses the needs of all learners, regardless of whether they are struggling or have advanced learning needs, and provides a clear, systematic approach for intervention when students are not on track to mastering these standards (CCSS, 2010).

A Multi-tiered System of Supports (MTSS) framework is defined as a "coherent continuum of evidence-based, system-wide practices to support a rapid response to academic and behavioral needs, with frequent data-based monitoring for instructional decision making to empower each student to achieve high standards" (Kansas MTSS, 2008). An MTSS framework encompasses both RTI models and Positive Behavioral Interventions and Supports (PBIS) models.

To date, more than 40 states have already implemented a version of MTSS, and students are benefiting from the early intervention and learning support that MTSS models provide (National Center for Learning Disabilities, 2011).

As defined by the National Center on Response to Intervention (2010): **"RTI integrates assessment and intervention within a multilevel prevention system to maximize student achievement and to reduce behavioral problems."** RTI delivery models typically include three or four tiers of instruction and intervention designed to provide differentiated support for students identified as in need of special services by providing effective early intervention in general and special education classrooms (Prasse, 2009). An essential component of RTI is that each tier includes research-based instruction, monitoring of student learning, and data-based decision making to ensure that each student receives the intensity of instruction and intervention that he or she needs in order to prevent future educational difficulties (Clark & Tilly, 2010; Batsche et al., 2005).

Like RTI, **PBIS models provide a continuum of supports** increasing in intensity based on the degree of students' behavioral and social needs, generally organized into three tiers of prevention. At each level, key components of the model include clearly defined expectations explicitly taught to all students, opportunity for students to practice the skills, reinforcement for students who meet expectations, and a system for monitoring student progress (Lane, Robertson, & Graham-Bailey, 2006; Sugai, Sprague, & Horner, 2002).
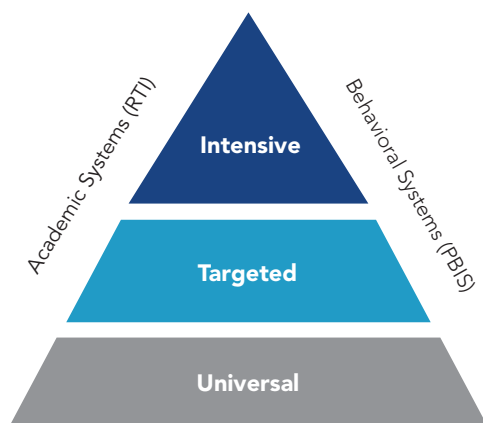
The purpose of PBIS is to take a **proactive approach** to addressing school discipline by promoting positive behaviors school-wide, identifying problem behaviors early, and responding to and reducing those behaviors through research-based instruction and intervention (Stewart et al., 2007). PBIS models have been found to be particularly effective in helping students with emotional and behavioral challenges to stay on track and experience success (Sugai, Sprague, & Horner, 1999).

By combining behavioral support with effective academic instruction, schools aim to increase the chances that all students will succeed (Stewart et al., 2007).

HOW *SYSTEM 44* DELIVERS

System 44 is designed with the recognition that behavioral issues and academic difficulties are often intertwined. *System 44* **helps educators address the principles of Multi-tiered Systems of Support (MTSS)** by addressing both Response to Intervention (RTI) criteria and Positive Behavior Intervention & Supports (PBIS) criteria in order to meet the needs of the whole child. The program includes embedded supports and procedures for increasing student engagement, promoting positive behaviors, and motivating students to succeed.

In *System 44*, all new resources and tools built in to instruction, planning, and data management are designed to support both academic and behavioral interventions. The MTSS resources found in the *Resources for Differentiated Instruction* (RDI) book and *44Book Teacher's Edition* **help teachers personalize the level of academic and behavioral intervention.** Teachers explicitly teach behavioral expectations for all rotations in the first three weeks. Aligned rubrics allow both teachers and students to effectively evaluate and monitor behavior through shared goals and expectations. Structured lessons for each day of Small Group allow teachers to introduce and strategically reinforce behavior and expectations throughout the year. Introducing the MTSS framework and tools early prevents academic and behavioral difficulties from becoming longterm challenges.

The *System 44* **Individualized Learning Plan (ILP)**, accessible via SAM and the Teacher Dashboard, provides teachers with a quick and simple way to set and monitor academic and behavior goals for each student. Via SAM, teachers can set academic goals for Decoding, Spelling, Fluency, and Independent Reading and align those goals to Individual Education Plans (IEPs). Data for these goals are collected through Student Software performance and teacher input. Teachers can also create customized benchmarks that align to their school's grading periods or IEP marking periods. The **ILP Data Snapshots** on the Teacher Dashboard provide an at-a-glance view to how an individual student is tracking toward his or her academic and behavioral goals within a benchmarked timeframe. When conferencing with students, teachers have the ability to adjust benchmarks toward cumulative academic and behavioral goals for each student within the SAM Student Digital Portfolio.

The *44Book* **instructional routines help teachers actively engage students and set clear behavioral expectations for the classroom**, thereby bolstering their students' level of motivation. In addition, each lesson in the *44Book* provides implementation tools to consistently support behavior and build positive classroom culture. Using the "My Tools" tab within their *44Book*, students are also empowered to record and monitor their behavioral progress using rubrics. Furthermore, RDI contains a variety of supplemental lessons for individual and Small-Group instruction that support the implementation of *System 44* within an MTSS framework.

Multi-tiered System of Supports

System 44 Individualized Learning Plan (ILP) Dashboard

PERSONALIZING INSTRUCTION WITH UNIVERSAL DESIGN FOR LEARNING PRINCIPLES

MULTISENSORY TEACHING

Universal Design for Learning (UDL) improves access to and participation in the general education curriculum for all students, including those with learning disabilities (Hitchcock & Stahl, 2003; National Joint Committee on Learning Disabilities, 2008; Rose & Meyer, 2000).

UDL is a set of principles that make learning universally accessible by creating flexible goals, methods, materials, and assessments to accommodate all learners' differences, including learning disabilities, physical challenges, and sensory impairment. Instructional materials designed with UDL principles increase student access to the curriculum by providing:

- Multiple means of representation of content to provide students a variety of ways to learn

- Multiple means of expression of learned content to offer students alternatives to show what they know

- Multiple means of engagement with content to motivate and challenge students appropriately (Rose & Meyer, 2000)

Since we know that our senses evolved to work together, such that vision influences hearing and so on, it follows that we learn best when stimulating several senses at once (Medina, 2008).

Multisensory teaching provides struggling readers with a structured language program that capitalizes on using multiple sensory inputs to allow students to master the foundational literacy skills that support the development of comprehension. Multisensory programs contain instruction in phonology and phonological awareness, sound-symbol association, syllable instruction, morphology, syntax, and comprehension (McIntyre & Pickering, 1995).

Multisensory experiences are incorporated into direct, systematic, sequential, and cumulative instruction that gives students practice with parsing language into small, manageable pieces that when woven together allow for the fluency and automaticity of word recognition that is required for skilled reading (Birsch, 2000).

Multisensory strategies have proven effective to help English learners make connections between content and language, and to support their communication and social interactions (Facella, Rampino, & Shea, 2005). For example, students with disabilities and English learners benefit from learning vocabulary with visual clues to help them understand word meaning (Ybarra & Green, 2003).

Training **software with multisensory presentations** helped students improve word writing skills with strong transfer from trained to nontrained words (Kast, Meyer, Vögeli, Gross, & Jäncke, 2007).

HOW *SYSTEM 44* DELIVERS

System 44's multisensory instructional approach gives students daily opportunities to view, listen, speak/record, and write about what they are learning by providing:

1. **Multiple Means of Representation**: Phonemic awareness skills are systematically reinforced in the Software in a one-on-one setting. For example, a Mouth Position Video or Animation provides both visual and aural models of accurate phoneme articulation. Additionally, multisensory phonemic awareness instruction is provided in the *System 44* Next Generation Teaching Guide with the following research-based practices: rhyming and alliteration, oddity tasks, oral blending, oral segmentation, and phoneme manipulation. Manipulatives and teacher-led instruction using the *44Book* offer additional opportunities to use **visual, aural, kinesthetic, and tactile modalities** to access lesson content. Multisensory components, such as spoken summaries and graphic organizers, help students improve reading and writing skills, thus fostering comprehension.

The Software reinforces this learning with Audiobooks and eBooks for listening comprehension, as well as background videos to build vocabulary and content knowledge in support of comprehension. Using the videos to build background knowledge is essential for reading, and children who struggle are not reading enough to adequately comprehend text when the topics are unfamiliar. The *System 44* Next Generation videos help students build the knowledge required to make meaning from text. The Software also provides text enhancements, such as highlighting when reading a passage for understanding, visualization strategies, illustrations of key vocabulary, and audio support at the word, sentence, and passage levels, as well as **508 compliance** to foster literacy learning.

2. **Multiple Means of Expression**: In the Software, students can practice and demonstrate fluency by reading and recording Software passages at the end of each Software series. During teacher-led lessons using the *44Book*, students have opportunities to express themselves through writing and discussion in one-on-one, small-group, and whole-group settings.

3. **Multiple Means of Engagement**: Small-group, whole-group, and independent activities provide a variety of settings for students to engage with the curriculum. *System 44* Next Generation Software activities encourage playing with sounds and symbols and provide differentiated instruction to meet students' varied needs. Likewise, paperbacks of graduated lengths focus on subjects relevant to students' lives and interests. They also provide vehicles for practice of comprehension strategies.

System 44 ensures that students build the foundational literacy skills that are needed for skilled reading and comprehension. Recognizing that these skills are necessary but not sufficient, *System 44* applies the principles of multisensory learning to the acquisition of comprehension strategies.

BLENDED LEARNING SOLUTIONS

Creating technology environments that heighten students' motivation to become independent readers and writers can increase their sense of competency (Kamil, Intrator, & Kim, 2000). Blended learning allows for this kind of environment.

Blended learning can be described both as a formal education program in which a student learns through online delivery of content and instruction while having some control over time, place, path, and/or pace, and as a supervised education program that occurs in a "brick-and-mortar" location (Staker & Horn, 2012).

Providing a fundamental redesign of instructional models, **blended learning seeks to accelerate learning** toward college and career readiness. The goal is to develop schools that are more productive for both students and teachers by personalizing instruction. In this way, blended learning can ensure that the most appropriate resources and interventions are available for students at the time that they need them (Bailey, Ellis, Schneider, & Vander Ark, 2013).

Blended learning has the potential to bring accessibility, affordability, and customization that might have previously been complicated, expensive, and standardized to educational places. In this way, it can transform learning experiences for students (Staker et al., 2011).

Blended learning that integrates face-to-face and digital learning can lead to **greater educational equity**, opportunities, and efficiencies for students. As we use technology and digital devices regularly in order to function in our personal and professional lives, it is reasonable to integrate these same resources into educational environments (Anderson & Skrzypchak, 2011).

Models of blended learning that follow a hybrid pattern build upon and offer sustaining enhancements to a regular classroom system while not disrupting it. Other models of blended learning that are more disruptive can transform the classroom system by becoming engines of change over the longer term (Horn & Staker, 2014).

HOW *SYSTEM 44* DELIVERS

System 44 **is a blended learning program harnessing the promise of technology and supporting effective teacher-led instruction.** The program includes key features in the Software and in the *44Book* that support students in developing foundational literacy and comprehension skills. The Software delivers a personalized learning path through systematic instruction in phonics, decoding, word recognition, and writing, while the *44Book*, an interactive work text, scaffolds close reading and comprehension of increasingly complex text, with an emphasis on nonfiction. Engaging eBooks build reading fluency, academic vocabulary, and strategies for comprehension. Additionally, the *44Book* builds competence with evidence-based writing, as the Software develops fluency in summary writing.

System 44's research-based Software **combines learning theories, pedagogical principles, and integrated media technology** in a unique way. The Software uses adaptive technology to customize and scaffold individual skill practice and application in phoneme manipulation, word recognition,

vocabulary, spelling, comprehension, writing, and fluency. Throughout the program's sequence, the Software offers consistent and targeted support and feedback with nonjudgmental and individualized coaching. Background videos in the Software help students build mental models of new concepts before reading an informational passage.

Personalized learning in *System 44* is driven by the proven FASTT (Fluency and Automaticity through Systematic Teaching with Technology) algorithm, which helps students manage their acquisition of new information and then carefully synthesizes this information as long-term memory in the brain. As students work independently on the computer, the *System 44* Software is automatically and continuously collecting student performance data, which feeds multiple reports that teachers use to inform Small-Group differentiated instruction.
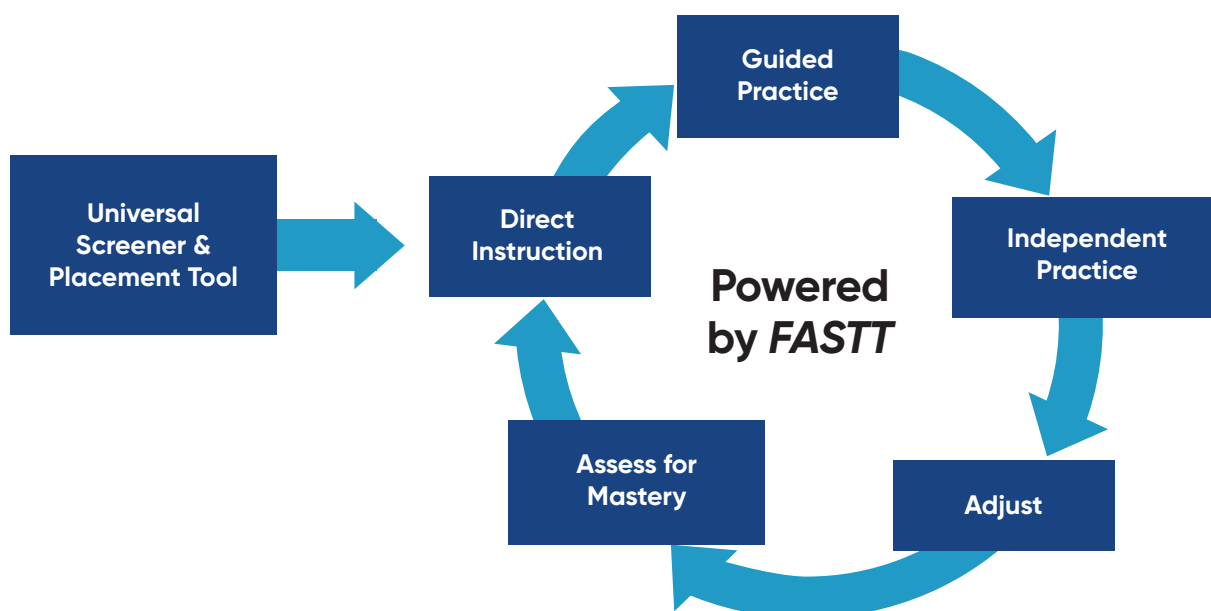
System 44 is powered by the FASTT (Fluency and Automaticity through Systematic Teaching with Technology) algorithm.

EFFICACY STUDIES

System 44 is improving the learning trajectory of over one million students each day. Endorsed by the Council of Administrators of Special Education (CASE) as an effective reading intervention program, *System 44* has a myriad of studies proving it effective for our most challenged readers. On the following pages, we have highlighted some of these studies that demonstrate the positive effects of *System 44* for students with disabilities, and English learners

For more evidence of the efficacy of *System 44* across the country, please see the *Compendium of System 44 Research* or visit **hmhco.com/System44.**
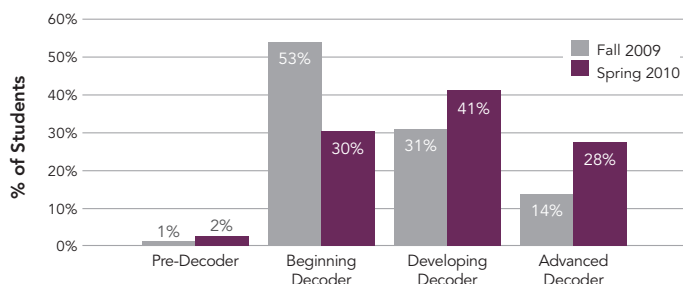
EFFICACY STUDIES

CENTRAL INDIANA SCHOOL DISTRICT, IN

Disability • English Learners • Independent Measure
• Specific Learning Disability

GRAPH 1

Central Indiana School District System 44 Students, Grades 3–12 (N=159)
Performance on *Phonics Inventory* by Decoding Status, 2009–2010

Note. The increase in the percentage of students performing at the Developing Decoder or Advanced Decoder level was statistically significant (t=5.67, p=.00).

GRAPH 2

Central Indiana School District *System 44* Students, Grades 3–12 (N=159)
Phonics Inventory Total Fluency Growth by School Level, 2009–2010
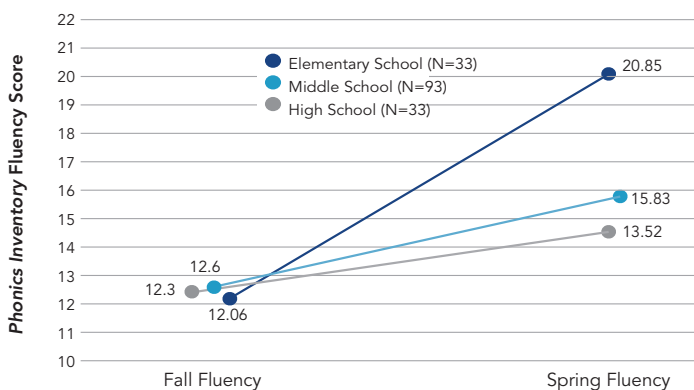
Note. The gains in Fluency score were significant for elementary (t=7.31, p=.00) and middle (t=5.07, p=.00) school students.

TABLE 1

Central Indiana School District *System 44* Students, Grades 3–12 (N=159)
Performance on WJ III by Student Group, 2009–2010

Student Group	N	WJ lll Basic Reading Skills Cluster		
		Mean Fall Standard Score (percentile)	Mean Spring Standard Score (percentile)	Mean Change in Standard Score
Limited-English Proficient	116	74 (4th)	80 (9th)	6
Students with Disabilities	49	64 (1st)	68 (2nd)	3

Note. WJ lll Basic Reading Skills Cluster gains were statistically significant for limited-English-proficient students (t=5.35, p=.00) and students with disabilities (t=3.62, p=.01).

SIGNIFICANT IMPROVEMENTS IN DECODING AND READING COMPREHENSION OCCUR FOR STUDENTS WITH DISABILITIES AND ENGLISH LEARNERS.

Evaluation Period: 2009–2010
Grades: 3–12
Assessment: Test of Word Reading Efficiency (TOWRE), Woodcock-Johnson III (WJ III), *Reading Inventory*, *Phonics Inventory*
Participants: N=159
Implementation: 50 to 120 minutes daily (Stand alone)

OVERVIEW

System 44 was piloted during the 2009–2010 school year in a Central Indiana School District that serves approximately 12,000 students at 13 elementary schools, 10 middle schools, and eight high schools. The district's student population is 71% Caucasian, 10% Hispanic, 9% African American, 5% Asian/Pacific Islander, and 5% multiracial. Thirteen percent are students with disabilities and 11% are limited-English proficient (LEP). Over half (55%) qualify for free or reduced-price lunch.

The district used *System 44* with 159 students in one elementary school, one sixth-grade academy, one middle school (Grades 7–8), and one high school. *System 44* was implemented in the district using a stand-alone model, for 50 to 120 minutes each day. Students were selected to participate in the intervention program if they scored below 400 Lexile (L) measures on the *Reading Inventory* and exhibited poor word-reading skills on the *Reading Inventory* and the *Phonics Inventory*.

During several years prior, the school district experienced an influx of Burmese refugees. Over half of the struggling readers placed in *System 44* were identified as Pacific Islander, another 18% were Caucasian, 12% were Hispanic, and 8% were African American. Nearly three-quarters (73%) of the *System 44* sample was classified as LEP, 96% were eligible for free or reduced-price lunch, and 57% were male. Approximately one-third (31%) of the *System 44* students were students with disabilities, with the most common classification being specific learning disability.

RESULTS

Phonics Inventory, Reading Inventory, the Test of Word Reading Efficiency (TOWRE), and the Woodcock-Johnson III (WJ III) were administered to all *System 44* students in the fall of 2009 and spring of 2010. Results demonstrated that the central Indiana *System 44* students improved in word-reading skills, as measured by the *Phonics Inventory*. In spring 2010, after participation in *System 44*, over two-thirds (69%) of students scored at the Developing Decoder performance level or above as compared to 45% in fall 2009 (Graph 1). Improvement in *Phonics Inventory* word-reading Fluency was evident at all school levels with elementary school students achieving the largest average gains in Total Fluency (Graph 2).

System 44 students also exhibited improvement in reading comprehension skills, as measured by the *Reading Inventory*. Overall, the sample of students improved from an average of 112L to 220L over the year, a statistically significant gain of 108L (t=9.79, p=.00). Disaggregated results showed that LEP students and students with disabilities demonstrated significant growth on the *Reading Inventory* from fall to spring, averaging gains of 112L (t=9.11, p=.00) and 94L (t=4.41, p=.00), respectively.

Results from the WJ III revealed significant improvements in foundational reading skills. On average, *System 44* students exhibited a statistically significant gain of 5 points (t=6.06; p=.00) on the WJ III. Furthermore, students with disabilities averaged a statistically significant gain of 3 points on the WJ III Basic Reading Skills (BRS), and LEP students averaged a significant gain of 6 points (Table 1).

On the TOWRE, *System 44* students averaged a significant overall gain of 2 points in Total Word Reading Efficiency (t=2.06, p=.00). High school students evidenced a significant average gain of 4 points on the same measure (t=4.05, p=.00). Elementary school, middle school, students with disabilities, and LEP students also demonstrated gains on the TOWRE, though not statistically significant.

JEFFERSON PARISH PUBLIC SCHOOL SYSTEM, LA

Disability • Economically Disadvantaged • English Learners

GRAPH 1

Jefferson Parish Public School System *System 44* Students, Grades 6–9 (N=124)
Performance on *Reading Inventory* by Student Group, 2009–2010
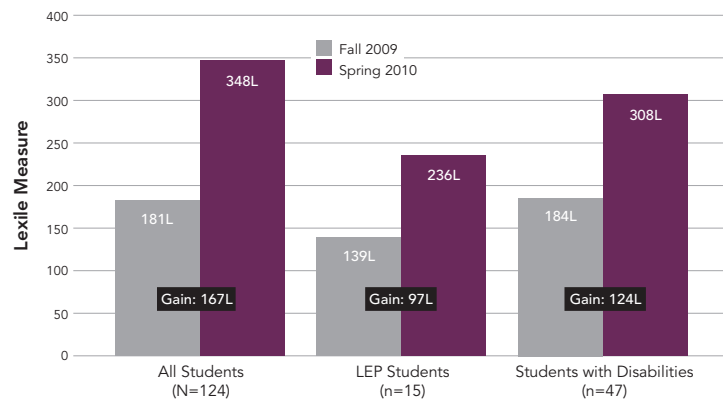
Note. The gains in Lexile were significant overall (t=9.83, p=.00), for students who were limited-English proficient (t=2.64, p=.02), and for students with disabilities (t=3.92, p=.00).

GRAPH 2

Jefferson Parish Public School System *System 44* Students, Grades 6–9 (N=124)
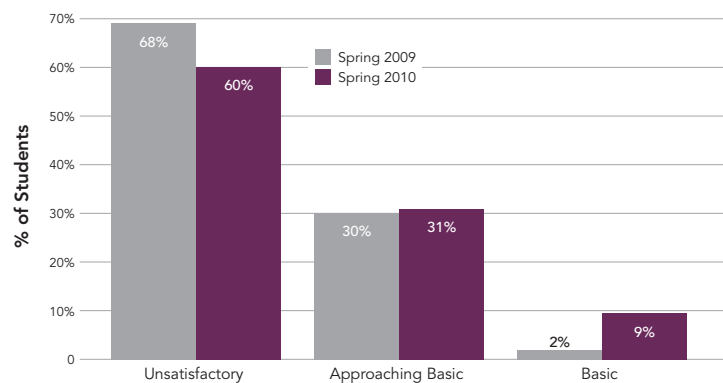Performance Levels on LEAP/iLEAP, 2009–2010

TABLE 1

Jefferson Parish Public School System *System 44* Students, Grades 6–9 (N=124)
Performance Levels on LEAP/iLEAP, 2009–2010

		2010 Leap/iLeap Performance Levels			2009 Total Count
		Unsatisfactory	Approaching Basic	Basic	
2009 Leap/iLeap Performance Levels	Unsatisfactory	67%	30%	4%	84
	Approaching Basic	46%	35%	19%	37
	Basic	33%	33%	33%	3
2010 Total Count		74	39	11	124

Note. Of the 74 students who performed in the Unsatisfactory Performance Level on the Leap/iLeap 67% remained in this level, 30% moved to the Approaching Basic Level, and 4% moved to the Basic Level.

LIMITED-ENGLISH PROFICIENT STUDENTS AND STUDENTS WITH DISABILITIES DEMONSTRATE SIGNIFICANT IMPROVEMENTS ON THE LEAP/iLEAP.

Evaluation Period: 2009–2010
Grades: 6–9
Assessment: Louisiana Education Assessment Program (LEAP), Integrated Louisiana Education Assessment Program (iLEAP), *Reading Inventory*
Participants: N=124
Implementation: 60 to 90 minutes daily (Stand alone or Integrated with *READ 180*)

OVERVIEW

Jefferson Parish Public School System (JPPSS) is located nine miles east of New Orleans. Its 89 schools enroll 44,000 students in Grades PreK–12. The district's student population is 50% African American, 32% Caucasian, 13% Hispanic, 5% Asian/Pacific Islander, and less than 1% American Indian/Alaskan Native. Seventy-five percent of all students qualify for free or reduced-price lunch.

At the beginning of the 2009–2010 school year, JPPSS's superintendent decided to allocate newly available federal stimulus funds for a reading program that would help the district meet the needs of its most struggling students. Students were enrolled in *System 44* based on several criteria, including performing at the Unsatisfactory or Approaching Basic levels on the Louisiana Education Assessment Program (LEAP) and Integrated Louisiana Education Assessment Program (iLEAP) English Language Arts (ELA) assessments, performing poorly on the *Reading Inventory*, and demonstrating difficulty with word-reading skills on the *Phonics Inventory*.

A total of 124 students were selected to participate in *System 44*. Of these students 60% were African American, 24% were Caucasian, 10% were Hispanic, and 2% were Asian. Thirty-two percent were designated as students with disabilities, and 12% were limited-English proficient (LEP).

JPPSS piloted *System 44* at 16 middle schools, seven high schools, and one alternative school with students who had not yet mastered basic phonics and decoding skills. *System 44* was either implemented as a 60-minute stand-alone program or embedded into existing *READ 180* classrooms for 90 minutes daily. Regardless of the model, all students used the Software for at least 20–25 minutes a day.

RESULTS

In 2009 and 2010, *Reading Inventory* and LEAP or iLEAP data were gathered from 124 students. Overall, *System 44* students demonstrated a significant improvement in reading comprehension on the *Reading Inventory*. On average, students' Lexile (L) scores advanced from 181L at pretest to 348L at posttest, an average gain of 167L. These statistically significant gains continued when results were disaggregated by student group. On average, LEP students and students with disabilities gained 97L and 124L, respectively (Graph 1).

Results demonstrated that *System 44* students as a whole made improvements in reading ability, as measured by the LEAP/iLEAP (Graph 2). In spring 2009, prior to the implementation of *System 44*, only 2% of these students achieved the Basic Performance Level. However, Graph 2 shows that by the spring 2010 LEAP/iLEAP administration, the percentage of students scoring in the Basic Performance Level increased to 9%. Conversely, the percentage of students scoring in the Unsatisfactory Level decreased from 68% in spring 2009 to 60% in spring 2010.

Further analysis revealed that among the 74 students who scored in the Unsatisfactory Level on the 2009 LEAP/iLEAP, 34% (30% +4%) of students moved up one or more Performance Levels on the 2010 LEAP/iLEAP. Similarly, of the 37 students who scored in the Approaching Basic Performance Level, 19% moved to the Basic Performance Level on the LEAP/iLEAP (Table 1).
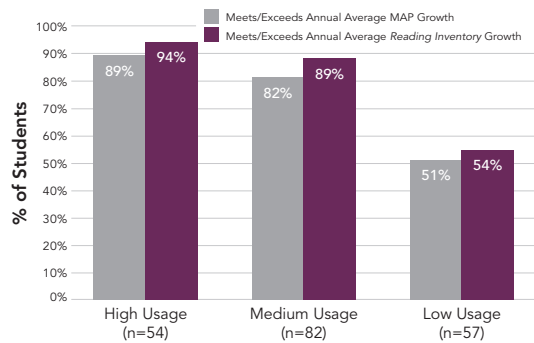
These positive trends continued when the results were analyzed by student group. *System 44* LEP students and students with disabilities made substantial gains in terms of the percentage of students scoring in the Basic range from 2009 to 2010. The percentage of *System 44* LEP students achieving Basic on the LEAP/iLEAP increased from 0% to 13% and the percentage of students with disabilities scoring in the Basic category increased from 3% to 8%.

KIPP NYC, NY

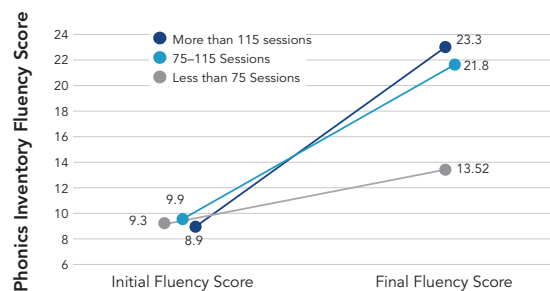Disability • Economically Disadvantaged • English Learners • Independent Measure

GRAPH 1

KIPP NYC School Students, Grades 3–8 (N=193)
Reading Inventory Growth as a Function of *System 44* Software Usage, 2014–2015

Legend:
- Meets/Exceeds Annual Average MAP Growth
- Meets/Exceeds Annual Average *Reading Inventory* Growth

High Usage (n=54): 89%, 94%
Medium Usage (n=82): 82%, 89%
Low Usage (n=57): 51%, 54%

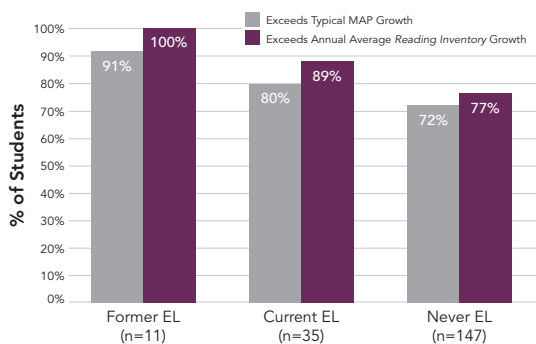*Note.* High Usage=More than 115 session, Medium Usage=75–115 sessions, and Low Usage=Less than 75 sessions.

GRAPH 2

KIPP NYC Students, Grades 3–8 (N=193)
Phonics Inventory Total Fluency Growth as a Function of *System 44* Software Usage, 2014–2015

Legend:
- More than 115 sessions
- 75–115 Sessions
- Less than 75 Sessions

Initial Fluency Score: 9.3, 9.9, 8.9
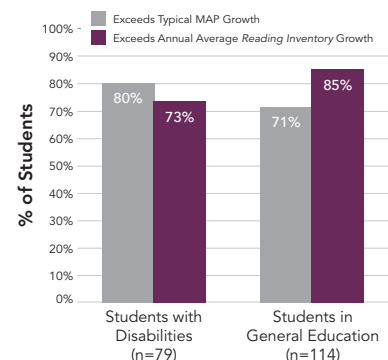Final Fluency Score: 23.3, 21.8, 13.52

GRAPH 3

KIPP NYC English Learner Students, Grades 3–8 (N=193)
English Learners: Impact of *System 44* on MAP and *Reading Inventory* Growth, 2014–2015

Legend:
- Exceeds Typical MAP Growth
- Exceeds Annual Average *Reading Inventory* Growth

Former EL (n=11): 91%, 100%
Current EL (n=35): 80%, 89%
Never EL (n=147): 72%, 77%

GRAPH 4

KIPP NYC Students with Disabilities, Grades 3–8 (N=193)
Impact of *System 44* on MAP and *Reading Inventory* Growth, 2014–2015

Legend:
- Exceeds Typical MAP Growth
- Exceeds Annual Average *Reading Inventory* Growth

Students with Disabilities (n=79): 80%, 73%
Students in General Education (n=114): 71%, 85%

SYSTEM 44 STUDENTS AT KIPP NYC EXCEED GROWTH EXPECTATIONS IN READING

Evaluation Period: 2014–2015

Grades: 3–8

Assessment: Northwest Evaluation Association Measures of Academic Progress (NWEA MAP), *Reading Inventory*, *Phonics Inventory*

Participants: N=56

Implementation: Daily 45- to 90-minute daily blended model

OVERVIEW

Knowledge Is Power Program (KIPP) is a national network of free, open-enrollment, college-preparatory public charter schools with a track record of preparing students in underserved communities for success in college and in life. KIPP NYC, a part of the national network, consists of 10 schools enrolling approximately 3,600 students in Grades K–12. There are four elementary schools, five middle schools, and one high school in KIPP NYC. The majority of the student body is African American (48%) or Hispanic (49%) and receives free or reduced-price lunch (88%). Fifteen percent are students with disabilities, and 8% are English learners (EL). The student attendance rate is 95.4%, and the annual student mobility rate is 5%. KIPP NYC's mission is "to teach our students to develop the character and academic skills necessary to succeed in high school and college, to be self-sufficient, successful, and happy in the competitive world, and to build a better tomorrow for themselves and us all."

During the 2014–2015 school year, 193 third through eighth grade students in five of KIPP NYC's middle schools were selected to participate in a study of *System 44*'s effectiveness. Students scoring Below Basic on The *Reading Inventory* and as Pre-Decoders, Beginning Decoders, or Developing Decoders on The *Phonics Inventory* were placed into *System 44* classrooms at KIPP NYC where they were expected to receive 45 to 90 minutes of instruction five times per week. The model varied across the schools with some classrooms using a stand-alone *System 44* implementation and some classrooms using an integrated *READ 180/System 44* model.

RESULTS

Data from NWEA® MAP, the *Reading Inventory*, and the *Phonics Inventory* were collected and analyzed for 193 students (18 third graders, 13 fourth graders, 133 fifth graders, 22 sixth graders, 3 seventh graders, and 4 eighth graders) who used the program during the 2014–2015 school year. There was a significant relationship between *System 44* use and student outcomes. Students completing more software sessions[1] demonstrated significantly greater gains on MAP® and the *Reading Inventory* (see Graph 1), as well as gains on the *Phonics Inventory* (see Graph 2).

Students averaged a significant gain of 11 RIT points on MAP, with 75% of students meeting or exceeding typical yearly Fall to Spring MAP growth. Students grew an average of 273L on the *Reading Inventory*, and 80% met or exceeded annual average growth. Forty-nine percent of students met or exceeded two times their annual average growth. On average, students demonstrated significant gains in both *Phonics Inventory* Accuracy (6.8 points) and Fluency (10.7 points).

For former ELs, 91% exceeded typical MAP growth, and 100% exceeded typical *Reading Inventory* growth (see Graph 3). For students with disabilities, 80% exceeded typical MAP growth, and 72% exceeded typical *Reading Inventory* growth (see Graph 4).
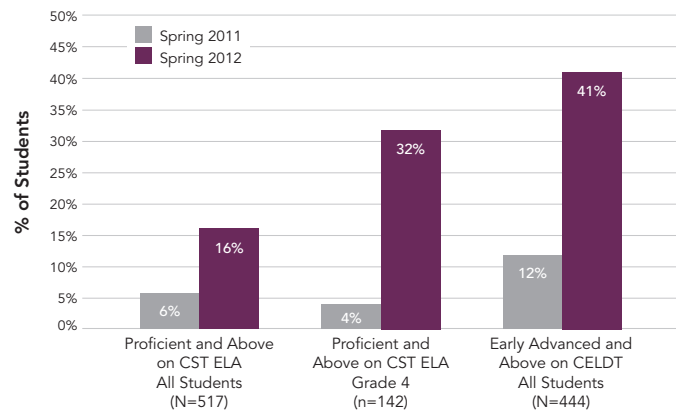
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[1] A *System 44* software session represents one day's usage.

NAPA VALLEY UNIFIED SCHOOL DISTRICT, CA

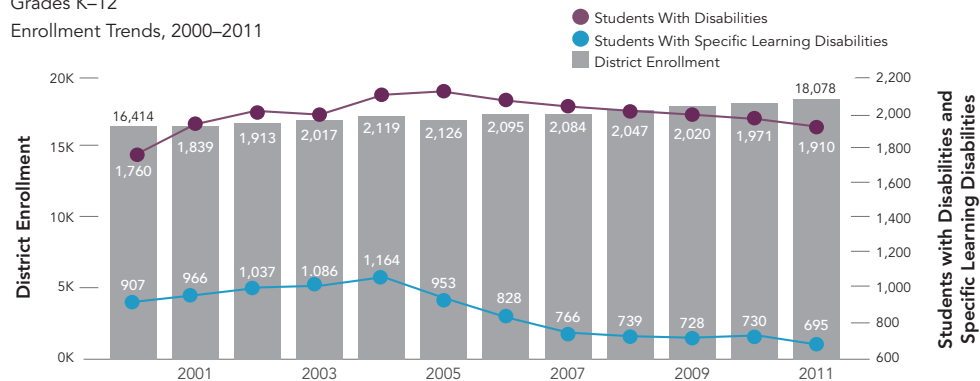Disability • Independent Measure • Specific Learning Disability

GRAPH 1

Napa Valley Unified School District *System 44* Students, Grades 3–11 (N=517)
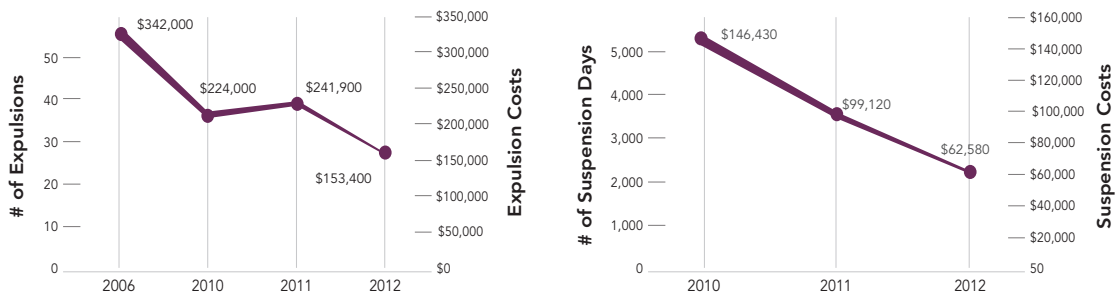Performance on CST ELA and CELDT, 2011–2012

Legend: Spring 2011, Spring 2012

Categories:
- Proficient and Above on CST ELA All Students (N=517): Spring 2011 6%, Spring 2012 16%
- Proficient and Above on CST ELA Grade 4 (n=142): Spring 2011 4%, Spring 2012 32%
- Early Advanced and Above on CELDT All Students (N=444): Spring 2011 12%, Spring 2012 41%

GRAPH 2

Napa Valley Unified School District Students With Disabilities and Specific Learning Disabilities, Grades K–12

Enrollment Trends, 2000–2011

Legend:
- Students With Disabilities
- Students With Specific Learning Disabilities
- District Enrollment

District Enrollment: 16,414 ... 18,078

Students With Disabilities: 1,760, 1,839, 1,913, 2,017, 2,119, 2,126, 2,095, 2,084, 2,047, 2,020, 1,971, 1,910

Students With Specific Learning Disabilities: 907, 966, 1,037, 1,086, 1,164, 953, 828, 766, 739, 728, 730, 695

GRAPH 3

Napa Valley Unified School District Students, Grades K–12
Expulsion Counts and Suspension and Costs, 2006–2012

Expulsion Costs: 2006 $342,000, 2010 $224,000, 2011 $241,900, 2012 $153,400

Suspension Costs: 2010 $146,430, 2011 $99,120, 2012 $62,580

IMPROVING OUTCOMES AND REDUCING COSTS WITH *SYSTEM 44* AND *READ 180*

Evaluation Period: 2011–2012
Grades: 3–11
Assessment: California Standards Test of English Language Arts (CST ELA), California English Language Development Test (CELDT)
Participants: N=517
Implementation: 30 to 120 minutes daily (Stand alone and Integrated with *READ 180*)

OVERVIEW

Napa Valley Unified School District (NVUSD) is representative of school districts in California and serves 18,078 students in 30 schools. Hispanic students comprise just over half of the student population. Located in a demanding agricultural region, the district also serves a large migrant population.

In the 2011–2012 school year, NVUSD partnered with Scholastic and Whiteboard advisors to investigate the use of *System 44* and *READ 180* with its students in Grades 3 through 11. These programs were chosen by the district as they are among the most researched competency-based reading intervention programs available. Additionally, *System 44* and *READ 180* are designed to support positive behavior interventions and supports (PBIS) that identify and sustain effective school-wide academic and behavioral practices that improve student outcomes. The programs do this by incorporating instructional management routines, classroom engagement, clear goal setting, and rewards that may be implemented in parallel with positive behavior interventions. In these ways, *System 44* and *READ 180* are in line with NVUSD's vision for improving student outcomes while reducing costs.

RESULTS

California Standards Test of English Language Arts (CST ELA) and California English Language Development Test (CELDT) scores were collected and analyzed for both *System 44* and *READ 180* students in Grades 3 through 11 who used the program during the 2011–2012 school year. This study reports out on results among students using *System 44* during the 2011–2012 school year, including 517 students with valid CST ELA data and 444 students with valid CELDT data.

Results from the CST ELA and CELDT demonstrated that students significantly improved their reading comprehension skills after one year of *System 44* (Graph 1). From 2011 to 2012, the percentage of *System 44* students in Grades 3 through 11 scoring Proficient and Above on the CST ELA increased from 6% to 16%, including a jump from 4% to 32% for the district's fourth graders. The CELDT corroborated these gains. Students using *System 44* experienced significant improvements from 2011 to 2012. In 2012, 41% of *System 44* students scored Early Advanced and Above on CELDT, up from 12% in the prior year. Similar results were reported for *READ 180* students[1].

In addition, referral rates, expulsion and suspension data, and financial data were collected and analyzed. The district tracked lower referral rates into special education since using *System 44* and *READ 180* (Graph 2). In 2004 the district recorded 1,164 students with specific learning disabilities. In 2011 that count dropped to 695. This trend allowed NVUSD to reduce its special education caseload, reduce its associated costs for students with specific learning disabilities, and better focus its services on its academic and behavioral priorities.

As part of the positive behavioral intervention program implemented at NVUSD, *System 44* and *READ 180* contributed to improved behavioral outcomes and cost savings (Graph 3). In 2009, the district recorded 58 expulsions. That figure dropped to 26 expulsions in 2012, which represented $188,600 captured by the district. Suspensions days dropped from 4,881 to 2,086 from 2010 to 2012, representing $83,850 that the district would have otherwise lost. The captured funds are reinstated back into NVUSD's program and behavioral priorities.
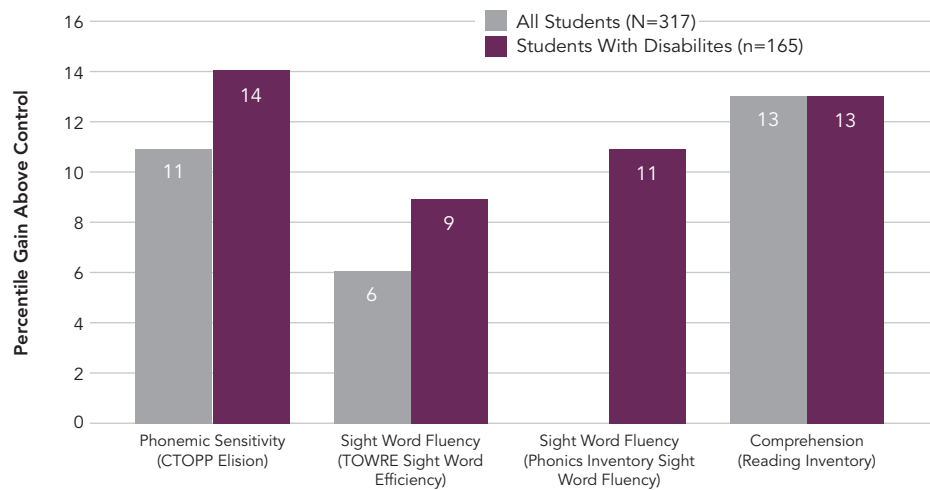
[1]These results can be found in the *READ 180 Compendium* at hmhco.com/READ180.

SAGINAW PUBLIC SCHOOLS, MI

Disability • Economically Disadvantaged • Independent Measure
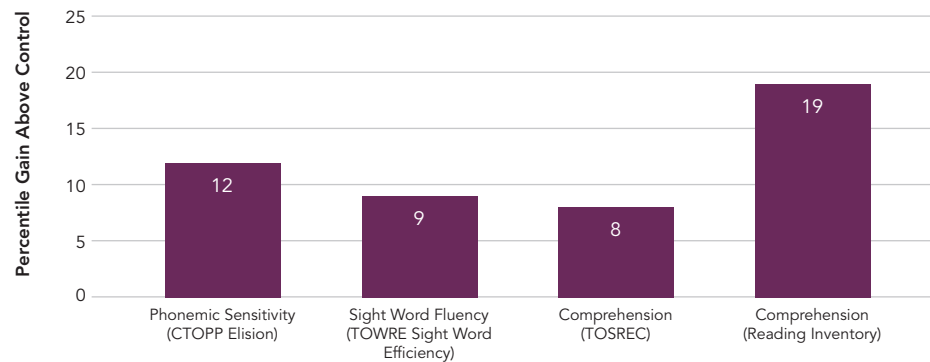
GRAPH 1

Saginaw Public Schools *System 44* Students, Grades 4–8 (N=317)
Performance on Reading Measures, 2011–2012

Note. Results shown for measures where significant effects were found.

GRAPH 2

Saginaw Public Schools *System 44* Students, Grades 6–8 (N=145)
Performance on Reading Measures, 2011–2012

Note. Results shown for measures where significant effects were found.

GOLD STANDARD STUDY REVEALS *SYSTEM 44* STUDENTS OUTPERFORM COMPARISON GROUP ON MEASURES OF WORD READING FLUENCY AND COMPREHENSION.

Evaluation Period: 2011–2012

Grades: 4–8

Assessment: Comprehensive Test of Phonological Processing (CTOPP) Elision subtest, Test of Word Reading Efficiency (TOWRE) Sight Word Efficiency and Phonetic Decoding Efficiency subtests, Test of Silent Reading Efficiency and Comprehension (TOSREC), *Reading Inventory*, *Phonics Inventory*

Participants: N=317

Implementation: 60 minutes daily (Stand alone)

OVERVIEW

Saginaw Public Schools (SPS) enrolls approximately 9,000 students in Grades PreK through 12. The majority of students in SPS are African American (65%), 20% are Caucasian, 13% are Hispanic, 1% are Asian/Pacific Islander, and less than 1% are American Indian/ Alaskan Native. Eighty-one percent of students are eligible for free or reduced-price lunch.

During the 2011–2012 school year, students from 12 elementary schools and four middle and K–8 schools in SPS were selected to participate in a randomized controlled trial study led by a third party research firm, RMC Research. In order to be eligible to participate, students had to meet the following three criteria: 1) perform below the 50th percentile on the Michigan Educational Assessment Program (MEAP); 2) score below 600 Lexile (L) measures on the *Reading Inventory*; and 3) demonstrate foundational reading deficiencies (Beginning or Developing Decoder) on *Phonics Inventory*. Eligible students who were placed into the *System 44* classrooms at SPS during the 2011–2012 school year were expected to receive 60 minutes of *System 44* instruction daily.

RESULTS

Implementation Results

Overall, teachers expected *System 44* to be more effective than their prior year's program in the five foundational literacy skills (phonemic awareness, phonics, vocabulary, fluency, and comprehension). These expectations were realized in phonemic awareness, phonics, vocabulary, and fluency according to Spring 2012 ratings of *System 44* effectiveness. The differences between the perceived effectiveness of the prior program and the *System 44* program, with respect to teaching phonemic awareness and phonics, were statistically significant.

Impact Results Overall

System 44 students performed significantly better than control group students on two of the individual standardized tests of word-level reading: CTOPP Elision (effect size of .27) and TOWRE Sight Word Efficiency (effect size of .16). This represents percentile gains of 11 points and 6 points, respectively. *Phonics Inventory* and *Reading Inventory* outcomes also showed positive gains for the *System 44* students over the control group students. The impact was significant on the *Reading Inventory* (effect size of .32). This represents a percentile gain of 13 points (Graph 1).

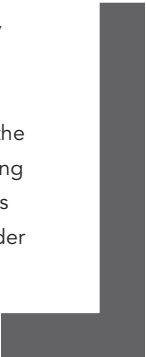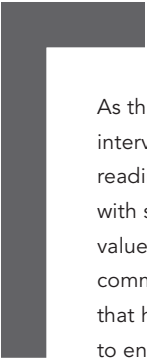### Impact Results for Students With Disabilities

Main effects for disability were revealed. The positive impact for students with disabilities was significantly larger than for the students overall on the CTOPP Elision (effect size of .36) and TOWRE Sight Word Efficiency (effect size of .24). This represents percentile gains of 14 points and 9 points, respectively. The positive impact was also significantly larger on *Phonics Inventory* Sight Word Fluency (effect size of .28). This represents a percentile gain of 11 points. In addition, the impact was significant on the *Reading Inventory* (effect size of .34). This represents a percentile gain of 13 points (Graph 1).

Impact Results for Middle School Students

The *System 44* middle school students performed significantly better than the control group students on three of the individual standardized tests of word-level reading: CTOPP Elision (effect size of .30), TOWRE Sight Word Efficiency (effect size of .24), and TOSREC (effect size of .20). This represents percentile gains of 12 points, 9 points, and 8 points, respectively. When disaggregated by students with disabilities, the significance held for the CTOPP Elision (effect size of .12) (Graph 2). The impact was significantly greater for the *System 44* middle school students than the control group middle school students on *Reading Inventory* (effect size of .49). This represents percentile gains of 18 points, 22 points, and 19 points, respectively. When disaggregated by students with disabilities, the significance held for *Reading Inventory* (effect size of .31) and *Phonics Inventory* Sight Word Fluency (effect size of .28). This represents percentile gains of 12 points and 11 points, respectively.

SUMMARY
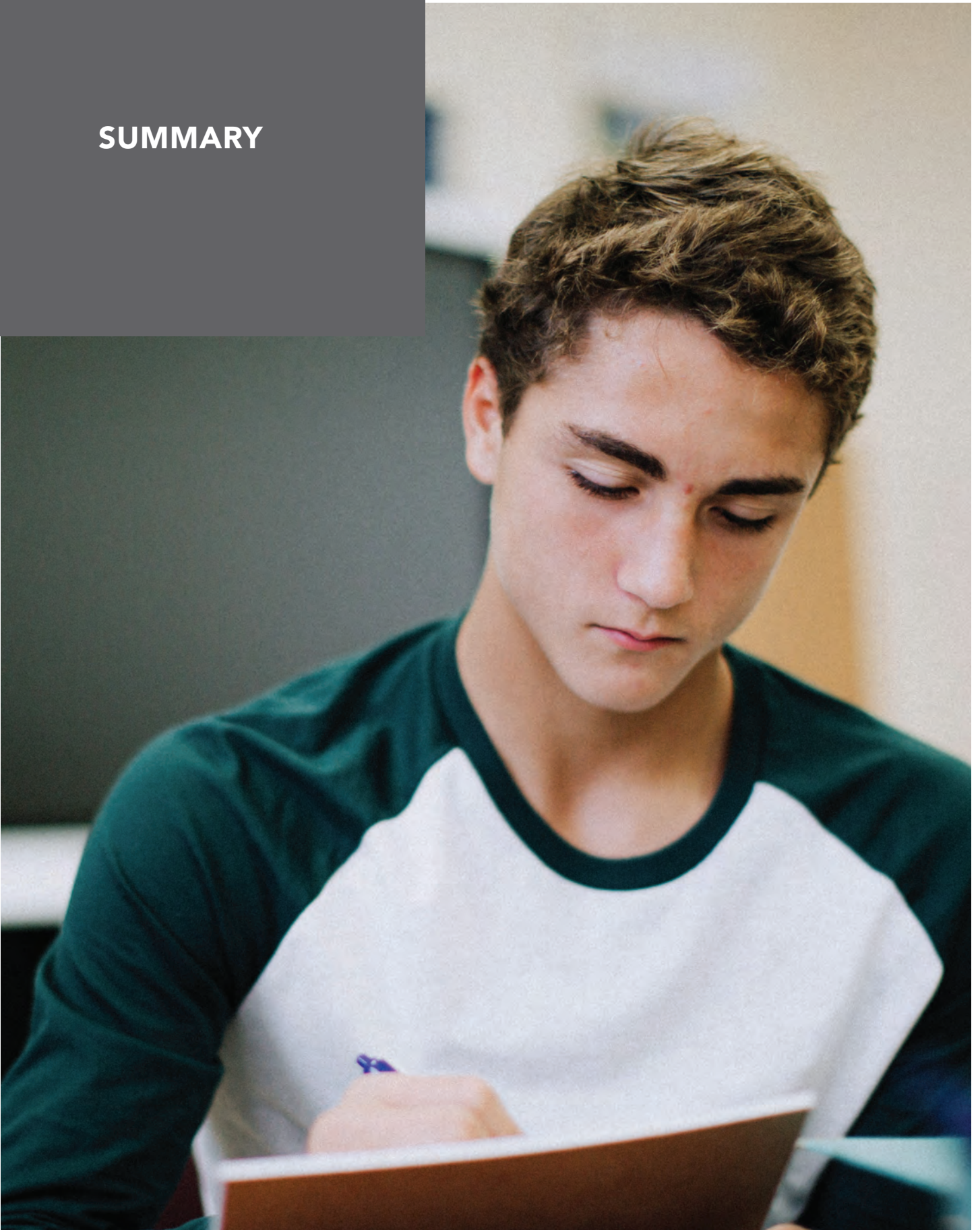
As this paper shows, *System 44* offers students with disabilities and English learners an intensive literacy intervention program deeply grounded in research and best practices. Direct, systematic instruction in reading and writing is combined with personalized and individualized instruction that supports students with special needs. With the realization that teaching should take into account each student's mindset, the value of his or her emotional needs, the importance of family engagement, and the need to build a strong community between teachers, students, and families, *System 44* provides effective intervention solutions that help students with a multitude of learning abilities and challenges achieve accelerated results in order to enjoy success in school, college, and career.

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NOTES

HMH Research Publications

## Research Into Practice Into Results

Research Foundations
Research Foundations papers, which include the Evidence and Efficacy papers, provide an in-depth account of the theoretical underpinnings, evidence base, and expert opinions that guide the design and development of new and revised programs. Research Foundations map known research and design principles to practical applications of the program.
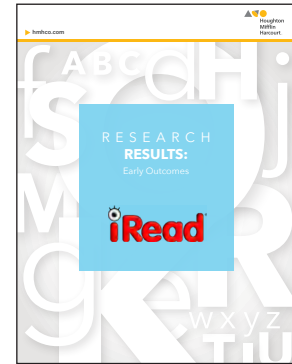
Research Results including Efficacy Compendiums
Research Results papers document the efficacy of a program in terms of Gold level studies (strong evidence), Silver level studies (moderate evidence), and Bronze level studies (promising evidence). At HMH®, program efficacy is monitored closely and continuously in a variety of settings, including varying geographical locations, implementation models, and student populations.
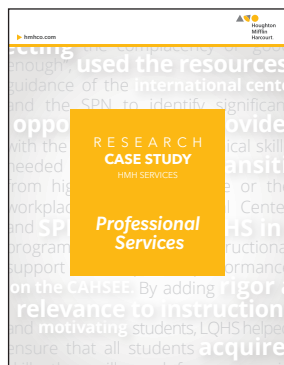

Research Case Studies
Research Case Study papers showcase research that is primarily qualitative and/or anecdotal. Research Case Study papers may profile a particular educator, student, implementation, or special population of students. Research Case Study papers strive to provide more context for understanding programs in practice.

Research Professional Papers
Research Professional Papers are typically authored by an expert in the field and highlight an important theoretical construct, practical application, program component, or other topic related to learning in the context of HMH programs.
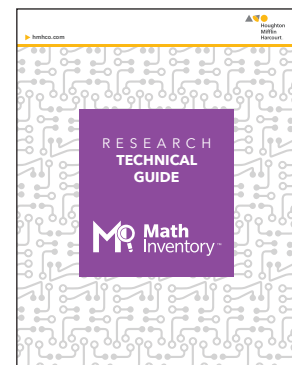
Research on Assessments
Research Assessments such as the Technical Guide accompany the release of a stand-alone assessment to demonstrate its reliability and validity. Technical Guides and supporting papers are periodically updated as additional reliability and validity evidence is collected in support of an assessment's use and functionality.

RESEARCH FOUNDATIONS PAPER

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