SAVVAS

Research
Evidence Base

SAVVAS literacy Screener & Diagnostic Assessments

Table of Contents

Introduction 3

Test Development 4

- Use of Screener and Diagnostics in Literacy 5
- Basis for Test Construction 6
- Adaptive Assessments 7
- Science of Assessments 7
- Vertical Scale Scores 8

Domains & Content Tested 9

- Emergent Literacy 9
- Foundational Skills 10
- Listening Comprehension 10
- Comprehension: Literature & Informational Text 11
- Vocabulary 11
- Alignment with Reading Rope & the National Reading Panel 12
- Assessment of the Science of Reading 12

Reporting 14

Conclusion 15

References 16

Introduction

> *...Literacy assessment is an integral part of literacy teaching and learning; that contributes to the conditions for literacy teaching and learning; and that professional knowledge about literacy assessment is a critical component of a literacy teacher's development and practice."*
>
> –National Council of Teachers of English (NCTE)

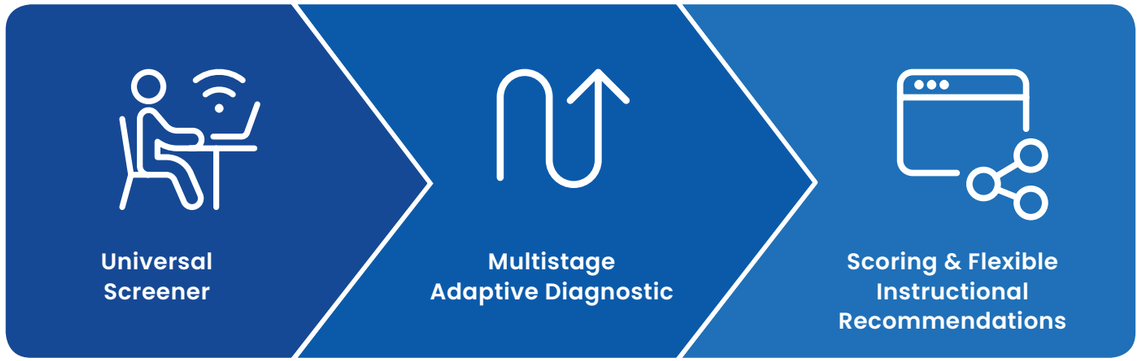
Literacy assessment is crucial to understanding the needs and abilities of individual students when it comes to implementing data-driven instructional practices (Schumm, 2006). Valid literacy assessments ensure that teachers can trace the progress of students as they build on strengths and increase their skills across important literacy domains (Afflerbach, 2012). Screening assessments help identify students who might be at risk for reading difficulty. They provide an initial indication of which students might need extra instruction and help identify students who might benefit from the types of early interventions that can keep them at or above grade level (Gersten et al., 2007). Diagnostic assessments provide information about why individual students may struggle with specific literacy concepts and help teachers plan customized instruction or interventions based on individual student needs. Together, these literacy assessments provide teachers with informative data that can guide instructional decisions, support differentiation, and make communicating learning goals to parents and other stakeholders easier (Torgesen, 2006). Data from literacy assessments is also invaluable in assisting administrators and other leaders in making informed curriculum decisions (Hamilton et al., 2009).

To assist educators in addressing each student's literacy needs, Savvas Learning Company (Savvas), in partnership with WestEd, developed the Savvas Literacy Screener & Diagnostic Assessments (LSDA) for use in grades K-8. Designed to maximize the power of instruction by targeting each student's greatest opportunities for growth, the LSDA makes pairing data with the right instructional resources accessible so educators can test less and teach more. The Savvas Literacy Screener and Diagnostic Assessments help teachers know if students coming into their classroom are prepared for grade-level content. Available on the Savvas Realize® platform, the screener tests prior-year skills. The adaptive diagnostic uncovers students' strengths and areas for improvement while also providing targeted instructional content to help students achieve their learning goals/objectives. Using assessments that work together, students' individual strengths and learning needs are identified and easily aligned with instructional resources that can provide the greatest opportunity for growth.

The LSDA Screener component is a relatively short assessment administered early in the school year to assess the prerequisite skills for the student's current grade. The Screener identifies learning challenges and provides a snapshot of readiness for grade level instruction, as well as identifies which Diagnostic Assessment would be the most appropriate to administer. The Diagnostic Assessment is designed to work in tandem with the Screener to provide more granular diagnostic information about student learning needs. The Screener should be given in the first two weeks of the school year and the Diagnostic shortly after to identify strengths and weaknesses relative to grade level content, while providing associated connections to instructional support. Because the Diagnostic assessment measures the on-grade level content knowledge students

are expected to master by the end of the year, it is designed to help identify current knowledge gaps so that meaningful learning can occur over the course of the year.

Once both components of the LSDA, the Screener and Diagnostic, have been administered, teachers have immediate access to score reports with norm-referenced student data, as well as on-level, above-level, or below-level instructional content suggestions. Well beyond testing, teachers can use the data of the LSDA to plan lessons, identify students needing either extension activities to maintain engagement and/or that require additional curricular support and learning resources. The LSDA Student Report provides teachers with targeted instructional resources and small/whole group lessons and practice resources for each level and domain. LSDA resources help support beginning of year planning, including differentiation and targeted instruction, to assist in better understanding where students are at the beginning of the school year and throughout their learning journey. These reports provide a comprehensive view of student learning by district, school, class, and individual student.



Test Development

Assessment is a vital part of any learning experience and literacy is certainly no exception. When students and teachers are provided with informative, targeted feedback, they are better able to utilize specific instructional recommendations and personalized content that allows for continued learning expansion. Specifically, providing learners with feedback is a major influencer of student achievement (Hattie, 2008). Valid assessments are designed to accelerate student progress and help ensure that instruction supports the development of higher-order thinking skills and improves differentiation for all types of learners (National Research Council, 2001 & Wood et al., 2007). When assessments are used to support the instructional process by providing information for both students and teachers, they accelerate students' learning progress (Fuchs & Fuchs, 2002). If we intend for students to become skilled readers and writers, we must recognize the importance of intensive literacy instruction that includes an array of assessments used to customize learning and direct interventions appropriately (St. Martin et al., 2020).

Use of Screener and Diagnostics in Literacy

1. Universal screeners and diagnostic assessments form the backbone of assessment for evidence-based literacy instruction. Screening assessments provide the starting point for identifying students who may be at risk for falling behind in literacy and require additional interventions (Petscher et al., 2019). Diagnostic assessments provide additional data to help pinpoint strengths and opportunities for growth and support educators in planning appropriate supplemental instruction or intensive interventions based on individual student needs. Data gleaned from diagnostic assessments allows educators to tailor instructional interventions and, if necessary, refer students for further evaluation (St. Martin et al., 2020). It is important to note in the context of literacy instruction that diagnostic assessments are not meant to identify a specific learning disability (e.g., dyslexia).

   Research strongly suggests that early screening and intervention programs for literacy increase the likelihood that students will remain at or above grade level and should include at least three levels of instructional support for students based on their risk for diminished reading proficiency. This includes core classroom instruction for students that are at low risk for literacy problems and read at or above grade level, additional support for students reading below grade level, and intense support for students reading well below grade level (National Center for Improving Literacy, 2019). Additionally, a valid screening assessment should include the following: 1) it should accurately classify students as at risk or not at risk for potential reading failure; 2) it should be efficient in terms of cost effectiveness, time sensitivity and has minimal barriers to universal implementation; and 3) the net effect for students must be positive (Messick, 1989). Specifically, no students or groups should be overlooked by the screening process and those identified as at risk for failure should receive timely and effective intervention.

   Students with teachers that provide them with diagnostic feedback are more likely to make positive changes in their learning. Diagnostic assessments enable educators to make inferences about learners' strengths and identify weaknesses in the skills being taught. However, the potential to advance student learning is only realized when diagnostic feedback is used by teachers and learners to direct future learning in meaningful ways that address the gaps in knowledge and areas for improvement (Jang & Wagner, 2013). Current research indicates that very large learning gains are more likely to occur when teachers provide students with engaging tasks, offer thoughtful feedback that clearly establishes what the student has accomplished and what logical next steps for learning are, and finally provide immediate opportunities for skill practice and revision based on feedback. Diagnostic assessment opportunities take advantage of data to help both students and teachers focus on ways to move student learning forward in a positive manner (Black & Wiliam, 2010).

   The Savvas Literacy Screener & Diagnostics Assessment (LSDA) was designed to help teachers understand students' prior knowledge, allowing for personalized instruction, early intervention, increased engagement, and student-specific instructional content recommendations. The LSDA was developed to be accessible to all students while supporting score interpretations and valid inferences about literacy achievement. Item writers received extensive training on WestEd's accepted practices in universal design, as well as additional training and instruction on methods to avoid bias and sensitive content in item development. From remediation to enrichment, the LSDA utilizes the following four phases to help teachers identify and provide the personalized content for every learner:

2. **Universal Screener**: A short digital screening assessment administered to all students at the start of the school year to help identify proficiency in prerequisite ELA/literacy skills, includes multiple

choice items and takes approximately 20-40 minutes to complete depending on grade level.

3. **Decision:** Based on the results from the Universal Screener, teachers decide whether to assign students an on-grade level or prior grade level Diagnostic Assessment.
4. **Diagnostic Assessment:** An adaptive diagnostic that examines in greater depth or more thoroughly to pinpoint student learning strengths and areas for improvement, the assessment utilizes multiple item types, including multiple choice, drag and drop, hot spots, and drop down, and takes approximately 35-60 minutes to complete depending on the grade level assigned.
5. **Instructional Recommendations:** Norm-referenced student data generates on-level, above-level, or below-level instructional content suggestions that help teachers customize literacy learning plans for each student. For grades K-5, this includes scaffolded reproducibles and student pages that allow teachers to introduce, model, and teach before guiding students through practice. For grades 6-8, this includes printable practice and interactive activities related to comprehension and vocabulary skills.

Basis for Test Construction

The purpose of the Savvas Literacy Screener is to identify any significant learning challenges that require additional screening and provide a snapshot of students' readiness for grade level instruction. This is important to complete at the beginning of the school year as it can provide valuable information to teachers, especially for struggling readers or those that are likely to struggle in the future (National Center on Improving Literacy, 2022). Additionally, the Screener indicates to teachers which of the Savvas Diagnostic Assessments would best measure the literacy performance of a given student. The Diagnostic Assessment provides more granular diagnostic information on students and is also used to identify students' strengths and weaknesses relative to grade-level content. Additionally, the Diagnostic provides teachers with associated connections to instructional support to personalize instruction for each student and address gaps in knowledge and skills over the course of the year (WestEd, 2022).

The goal of the diagnostic is to find the strengths and gaps in student knowledge and skills and help target interventions to accelerate student progress (Davies, 2022). Savvas partnered with WestEd, a nonpartisan research, development, and service agency to identify the relevant standards to be assessed at each grade level, as well as the specifics for the pool of items for each standard. Standards and content from the Common Core State Standards for English Language Arts (CCSS-ELA) in grades K-8 were used to develop the LSDA and include the following domains: Reading Comprehension: Literature; Reading Comprehension: Informational; Vocabulary; Foundational Skills. The content was supplemented with clarifications provided in the Partnership for Assessment of Readiness for College and Careers (PARCC) Evidence Statement Tables[1] which describe the knowledge and skills that an assessment item or a task elicits from students (New Meridian Resource Center, 2019). Each of the test items was also linked to the propriety Savvas skill spines that correspond to Savvas curriculum materials (WestEd, 2022).

The Savvas Literacy Screener and Diagnostic Assessments were developed to be accessible for all students to support score interpretations and valid inferences about Literacy performance for all students. WestEd's item development guidelines and item writer training on accessibility, universal design, and bias and sensitivity helped to ensure that test items and supporting materials were as free as possible from unnecessary access barriers that might limit the demonstration of student achievement. This training follows best practices for achieving cultural validity which includes the awareness of sociocultural influences that may shape student thinking and the ways in which students make sense of items on a test and respond to them (Solano-Flores & Nelson-Barber, 2000). All item writers received training on WestEd's accepted practices in universal design, as well as training on methods to avoid bias and sensitive content in item development. This training is informed by research from the National Research Council (1999, 2001, 2003), Linda Darling-Hammond (2010, 2012, 2013), and the U.S. Department of Education's Institute of Education Sciences (2009) (WestEd, 2022).

The item development process was iterative with many rounds of review at both WestEd and Savvas to ensure that the final item pool adhered to the approved guidelines. This included two rounds of content editing, two rounds of proofreading, and a final-eye review before the items were submitted to Savvas. Savvas content experts also completed their own round of reviews and submitted requests for revisions as needed (WestEd, 2022). Items developed for the Screener were intended to be brief and include multiple choice items only. Multiple choice questions are the most widely applicable and useful type of test item and are useful in measuring important educational outcomes (Al-Rukban, 2006). The more in-depth Diagnostic Assessment provides students a variety of opportunities to demonstrate knowledge by utilizing multiple choice, drag and drop, hot spots, and drop-down item types (Savvas, 2022). Drag-and-drop and hotspot items, both used on the SBAC and other state and high-stakes assessments, are well suited for visual learners and reduce the effect of random guessing, strengthen measurement, and improve test-taker engagement and motivation (Jiang et al., 2021; and Parshall & Harmes, 2014). While the drop-down menu question format is like the multiple-choice item type, it is also a useful way for students to visualize fill-in-the-blank style questions. The student must make multiple comparisons, something that cannot as easily be done with a multiple choice, single-answer item.

Adaptive Assessments

The LSDA Diagnostic retains the benefits of adaptive testing over traditional, linear tests, in that it is both computer based and multi-stage adaptive and information is presented in a clearer manner than with traditional paper testing. This means that results reflect a more precise measurement of student abilities, but also reduce testing and score reporting times (Hendrickson, 2007; Han, 2020). While the Diagnostic adapts to each examinee's ability, it uses fewer items and a shorter testing time than a traditional assessment to achieve the comparable measurement accuracy, while reducing test fatigue. As well, the LSDA uses multi-stage adaptive testing (MST) approach to provide personalized results for each student.

Multi-stage adaptive tests generate questions at the subsection (called "blocks") or item-set level, rather than at the item level as compared to computerized adaptive testing (CAT). The MST approach offers several advantages over the item-level CAT approach, including reduced context effects and greater control over content specification. The LSDA Diagnostic utilizes MST design capabilities to provide students with a more familiar testing environment, thereby reducing the likelihood of testing stress and anxiety. Additionally, the design of the Diagnostic allows test developers to more readily monitor and control the quality of the assessment, because the item "blocks" are assembled before administration (Zheng et al., 2012).

Science of Assessments

Today's effective teachers must be able to implement and utilize assessments that measure higher order thinking skills through comprehensive, balanced, and responsive testing procedures (Brookhart, 2011). The landscape in which students learn, teachers teach, and assessments are designed and administered, has changed significantly in the last century. Paper and pencil tests are falling out of favor, replaced by adaptive testing procedures delivered online and administered in Technology Rich Environments (TREs). TREs afford ample opportunities for students to acquire and demonstrate necessary 21st-century skills, such as higher order thinking and problem-solving

[1] https://resources.newmeridiancorp.org/ela-test-design/

skills, across domains. They also create a rich arena for deep learning and assessing core knowledge and skills in literacy, math, and science (Schute et al., 2016). Twenty-first century assessments need to be adaptive, employ dynamic questions, interactive tasks, and real-world simulations (Gierl & Haladyna, 2012). Valid, reliable tests are particularly critical when assessments are used to make pedagogical decisions such as where to place a student, what interventions to use, or whether additional testing is needed (Pentimonti et al., 2017).

A variety of assessments may be used for screening and diagnostic purposes and screeners may take the form of curriculum-based measurement, standardized reading tests, criterion, or norm-referenced assessments (The IRIS Center, 2006). Universal screeners often use a benchmark cut point, or criterion reference, set at a proficiency level that is expected for a student's grade level. Students unable to meet grade level benchmarks utilized by screeners may be considered at risk for future reading difficulties (Biel et al., 2020). Similarly, diagnostic assessments are frequently norm-referenced, though not exclusively (Munger, 2016). Properly designed literacy screeners can be significantly predictive of future reading outcomes, underscoring the importance of using valid and reliable assessments in this sphere (Missall et al., 2007).

Valid literacy assessments should also target grade and domain appropriate skills. Six broad forms of validity apply to literacy assessments, including content validity (e.g., relevance and quality of test items); substantive validity, or the theoretical basis that explains the consistency in responses to test items; structural validity, or how the grouping of scores aligns with what would be expected from what the items measure; generalizability, or how well scores generalize across different samples and administrations; external validity, or how well scores correlate or not with external factors; and consequential validity, or how test results relate to decisions made on their basis (Petscher et al., 2019).

Vertical Scale Scores

Scale scores on a common scale are used to convey consistent information about student achievement. A vertical scale is a common cross-grade scale score system that allows for the direct comparison of student test scores across grade levels. Vertical scaling is the process of placing test scores that measure similar content at different grade levels onto a common scale, called a vertical scale (WestEd, 2022). This is particularly important as it allows educators to track student growth across grade levels, set goals, track student progress toward those goals over multiple school grades, and adjust instruction as needed (Dadey & Bridggs, 2012; and Berger et al., 2019).

Vertical scaling involves many factors and research tends to show that vertical scaling is design-dependent, group dependent, and method-dependent (Tong & Kolen, 2008). The data collection design used to develop the vertical scale for the LSDA was the common-item non-equivalent groups design, in which students in adjacent grade levels respond to both common and unique items, thereby allowing direct comparison of item difficulties across grades. This design allowed the entire item pool to be placed on the same scale. The common items between adjacent grades determined the scaling relationship between tests in adjacent grades (WestEd, 2022).

Nine separate Rasch item calibrations were used to create nine separate scales, one for each grade. The Rasch model, which is considered to be a useful measure to calibrate and scale assessments (Guskey, 2016), constructs a variable by locating each item on a logit scale oriented to extend from most to least difficult (Lunz, 1989). The grade 8 scale was selected as the base. To place grade 7 on the grade 8 scale, the common items are used to calculate a vertical scale constant between grade 8 and grade 7. This constant is added to the grade 7 mean of 0 to adjust for the difference in difficulty between the two scales. For grade 6, a scaling constant had to be calculated based on the items common between grades 6 and 7. This chaining of scaling constants was continued all the way through to Grade K (WestEd, 2022).

Domains & Content Tested

The Savvas Literacy Screener and Diagnostic Assessments include the following domains: Comprehension, both Literature and Informational, including Listening Comprehension for level A (PK domains included); Vocabulary; and Foundational Skills, including Emergent Literacy, for level A (PK domains included). Each of the items was linked to the Common Core State Standards and proprietary Savvas skill spines that correspond to Savvas curriculum materials. The following table provides an overview of each of the LSDA domains and grade level correlations broken out by the Screener and Diagnostic assessments.

LSDA DOMAINS	GRADES Screener = S Diagnostic = D								
	K	1	2	3	4	5	6	7	8
Emergent Literacy	S								
Listening Comprehension	S								
Foundational Skills	S, D	S, D	S, D	S					
Comprehension: Literature	D	S, D	S, D	S, D	S, D	S, D	S, D	S, D	S, D
Comprehension: Informational Text	D	S, D	S, D	S, D	S, D	S, D	S, D	S, D	S, D
Vocabulary	D	S, D	S, D	S, D	S, D	S, D	S, D	S, D	S, D

Emergent Literacy

Emergent Literacy is the combination of critical skills young learners need to develop before they can learn to read. These emergent literacy skills begin in early childhood when young children learn to use verbal and nonverbal communication patterns, including speech and sign language, to express themselves. Emergent literacy skills are the precursors to foundation skills and typically include the beginnings of skills needed to understand print knowledge, phonological awareness, vocabulary, and oral awareness (Kosanovich et al., 2020).

While emergent literacy skills originate and develop throughout the preschool period for most children, many young learners arrive to pre-kindergarten and kindergarten well behind their peers in emergent literacy skill attainment. These gaps in understanding make it less likely that young students will be appropriately prepared for the reading instruction they will receive in the early elementary grades (Lonigan, 2012). The number of kindergarten aged children who require additional literacy resources is substantial. Children with primary speech and language impairment account for 43% of those who receive special education services within elementary schools, with many more students requiring additional resources to bring their speech and reading skills to grade level (Skibbe et al., 2020). The U.S. Department of Education has recommended the application of screening tools to assess emerging literacy in kindergarten, noting that tools which assess letter naming fluency, phoneme segmentation and expressive and receptive vocabulary are especially important (Gersten et al., 2008). Specifically, phonological awareness skills have been shown to have strong implications for later literacy achievement and should be integrated into the screening process for early learners (Skibbe et al., 2020).

Screeners for kindergarteners should have the technical characteristics of reliability and validity (Gersten et al., 2008). The importance of these characteristics is also noted by the National Center for Learning Disabilities which recommends a screening approach that provides, "quick understanding" of how well one or more students in each setting are demonstrating knowledge and understanding (National Center for Learning Disabilities, 2020). Screener application has been linked to increases in phonological awareness, vocabulary content knowledge, and sentence comprehension in kindergarteners (Lane, 2014). These emergent literacy skills are the precursors to foundational literacy skills and related skill attainment helps set young learners up for success in later grades (NIH, DHHS, 2010).

Foundational Skills

Foundational literacy skills are the beginning processes of reading. They facilitate students' understanding of important beginning reading concepts such as print concepts, phonological awareness, phonics and word recognition, and fluency (Caravolas et al., 2019).

Foundational reading skills provide students with the knowledge to read words (alphabetics), relate those words to their oral language, and read connected text with sufficient accuracy and fluency to understand what they read (Foorman et al., 2016). Phonemic awareness is a critical skill for elementary aged children, as studies indicate that ninety percent of children with significant reading problems have a core deficit in phonological processing (Tangel & Blachman, 1995; NICHD, 2000). Young students must have a solid phonemic awareness in order to grasp the basic language skills required for reading and writing, including hearing and the identification and manipulation of sounds in spoken words. These foundational phonemic skills also mean students must be able to comprehend the basic symbols comprising the written language and letters of the alphabet that represent the auditory cues for spoken language (Blachman, 2000).

Assessing foundational literacy skills ensures there is a strong basis for directing future literacy learning, access to higher-order skills, and conceptualization of future curriculum choices. When teachers understand what foundational literacy skills need attention, they are better poised to put their students on a steeper learning trajectory, by unlocking higher order skills and helping students master the basics so they get more out of future educational endeavors (Belafi et al., 2020). Addressing gaps in foundational literacy skills also means learners can keep up in class and will be more likely to stay in school longer, which can greatly impact future life outcomes like potential earning, quality of life, and better health outcomes for future generations (Evans & Hares, 2021).

Listening Comprehension

Listening comprehension is the ability to comprehend spoken language at the discourse level, including narratives, conversations, stories, and informational oral texts, that involves the processes of extracting and constructing meaning (Kim et al, 2016).

Recent emerging evidence indicates that listening comprehension is a higher-order skill that requires multiple language (including vocabulary) and cognitive skills (Florit et al., 2013; Kim & Phillips, 2014; Lepola et al., 2012; Tompkins et al., 2013). Oral language skills such as vocabulary and listening comprehension are the precursors to reading comprehension, the importance of which increases as young children develop reading skills (Foorman et al., 2015; Kim et al., 2012; Kim & Wagner, 2015). In the early grades, when learning to read is the focus of classroom instruction, reading comprehension is primarily constrained by decoding skills. The instructional texts children encounter in the early grades are often written below the level of their oral language comprehension. However, the simple view of reading predicts a change in the relative importance of decoding and listening comprehension over time (Baker et al, 2014).

There are many constituent parts of listening comprehension, including cognitive, effective, content knowledge as well as social and psychological factors (Yekeler, 2020). The use of computer-based assessments in screening tied with appropriate intervention has been linked to improvement in listening comprehension in the sciences and in literature (Lin et al, 2015; and Mulyadi et al, 2021). From a pedagogic view the assessment of listening comprehension is central to our need to teach young pre-kindergarten and kindergarten learners, as well as to assess language comprehension to ensure that young students have the skills necessary to achieve success in later literacy endeavors (Buck, 2011).

Comprehension: Literature & Informational Text

Reading comprehension is the process of extracting and constructing meaning through engagement with written language, specifically words. Text types can be divided into two major categories, literary and informational. Literary texts include poetry, drama, fiction, and literary nonfiction. Informational texts include expository, persuasive, and procedural texts (RRSG & Snow, 2002).

Reading comprehension is the key that unlocks additional learning and skills so that students are able to read increasingly more complicated texts, which in turn increases their capacity for future learning. The more students read, the more intelligent they are able to become, and this increases their general capacity for understanding (Kintsch, 2018). Reading comprehension is the "ability to understand the meaning of what is said, or read, as well as its intent" (Cunningham & Zibulsky, 2014). When students are given ample opportunities to practice a system of strategic actions, such as complex processes involving the utilization of a wide range of skills, strategies, and conceptual understanding, they are engaging in the complex process of high-level comprehension (Fountas & Pinnell, 2007).

In order to fully demonstrate reading comprehension, many different components, relying upon a variety of different kinds of information and yielding complex mental representations, must come together into a cohesive understanding of what is being read (Kintsch & Rawson, 2008). It is important to assess students across content to understand how they engage and interact as they read different types of texts. Teachers must incorporate lesson plans and supports that build a system for processing texts and utilize skills rooted in earlier reading behaviors, so that the process recreates itself and allows students to read increasingly complex texts. Reading is the culmination of literary thinking from all aspects of the text and reading comprehension encompasses the process of finding meaning in text in order to construct a larger, deeper meaning within which the reader develops a relationship with what is being read (Fountas & Pinnell, 2007; and RAND Reading Study Group, 2002).

Vocabulary

Vocabulary attainment is the process of acquiring new words to use in developing any language. Teaching students to develop vocabulary means providing explicit instruction that includes decoding text, along with strategies to learn word meanings independently so that learners can understand the meaning of new words and concepts in various contexts and across all academic content areas (Kamil et al., 2008; Loftus & Coyne, 2013).

Vocabulary is undoubtedly an important aspect of literacy learning. Students need to master vocabulary to succeed in all other content areas, including math and science (Marzano, 2010). Vocabulary and the associated background knowledge have a profound influence on students' ability to comprehend what they read. Background knowledge is evident in the vocabulary used in oral and written language, and the ability to acquire new vocabulary is linked to background knowledge (Fisher & Frey, 2012). Excluding academic vocabulary from lessons and subsequent assessments is detrimental to student learning, as these skills are important tools for reading comprehension and other core reading skills. Vocabulary and background knowledge are widely recognized as critical factors for both academic

learning and learning in general (Fisher & Frey, 2014; Kamil et al., 2008). Additional research suggests that background knowledge and vocabulary are the strongest predictors of comprehension and that they indirectly influenced whether students would apply higher order problem solving skills when they struggle to interpret advanced texts (Cromley & Azevedo, 2007).

Assessment of vocabulary is critical for identifying children at risk for reading problems and for designing appropriate instruction. Effective teachers need multiple measures to capture the multidimensionality of students' vocabulary knowledge (NICHD, 2000). The RAND Reading Study Group acknowledged the strong link between vocabulary knowledge and reading comprehension and speculated that it is an especially important factor in understanding the reading problems experienced by second-language learners (RRSG, 2002). What we know about the nature of instruction that influences vocabulary learning can aid in the design of assessments (NICHD, 2000).

Alignment with Reading Rope & the National Reading Panel

Dr. Hollis Scarborough's Reading Rope provides a powerful illustration of the multiple strands of proficient reading. The rope model unravels the critical skills of word recognition and language comprehension, directly informing our understanding of why some students succeed and some struggle. In addition, the Reading Rope provides a guide for effective instruction and explains how essential language skills work together to develop skilled readers (Scarborough, 2001). Like the Reading Rope, research done by the National Reading Panel has identified key concepts at the core of every effective reading instruction program. Originally called the 5 Pillars of Reading Instruction, further evidence based on the growing body of the Science of Reading research over the past 20 years, has led to an expansion of the original five pillars to include (NIH, DHHS, 2010):

1. Phonemic awareness
2. Phonics
3. Fluency
4. Vocabulary
5. Comprehension
6. Writing
7. Assessment
8. Motivation

Both the Pillars of Reading and Scarborough's Reading rope are consistent in their assertion that the strands of reading domains must work in concert with one another in order for learners to read. The word-recognition strands in the Reading Rope (phonological awareness, decoding, and sight recognition of familiar words) work together so that a reader increases in their reading accuracy, fluency with repetition and practice. At the same time, the language-comprehension strands of the Reading Rope (background knowledge, vocabulary, language structures, verbal reasoning, and literacy knowledge) work in tandem and weave together with the word-recognition strands to create a skilled reader (Scarborough, 2018). Similarly, and in alignment with both the Reading Rope and National Reading Panel's Pillars of Reading, the Savvas LSDA allows identification of literacy domains where students may require additional support. This ensures that the essential skills needed for reading are working together (Block & Israel, 2005). LSDA gives teachers a data driven tool to identify which strands need additional attention and helps them provide the instructional support to meet their students' needs when it comes to learning to read.

Assessment of the Science of Reading

Encompassing years of scientific knowledge, across many converging disciplines, the body of research surrounding best practices in literacy is collectively known as the Science of Reading. The Science of Reading's conclusive, empirical research, spanning the fields of education, neurology, biology, special education, psychology, literacy, and more, helps us understand how we learn to read, what skills are involved, how they work together, and which parts of the brain are responsible for reading development (Jiban, 2021). This collective work further identifies best practices for educating students in literacy so that they have the skills, knowledge, and passion to become lifelong readers and learners (McCardle & Chhabra, 2004).

Drawing on the Science of Reading best practices in literacy, the LSDA was created to bring curriculum, instruction, and assessment into alignment. The LSDA measures four literacy domains: 1) foundational skills; 2) vocabulary; 3) reading comprehension: literature: and 4) reading comprehension: informational. This includes additional domains for PK included in the K level (emergent skills and listening comprehension) to ensure early literacy skills are in place and targeted instruction can occur in a timely manner. Research has shown time and time again that early reading skills are predictive of future reading outcomes, including phonological or phonemic awareness, letter knowledge, rapid naming, and oral language, and should therefore be monitored in the early grades (Phillips et al., 2009). Specifically, these foundational skills are appropriate for early grades screening, while assessments for older students should include the addition of constructs that measure higher order skills, such as reading comprehension (Pentimonti et al., 2017). Each of the emergent and foundation reading skills work together so that when these skills are integrated, they provide an entry point to complex literacy. The four main foundational literacy skills include print concepts, phonological awareness, phonics and word recognition, and fluency and are best supported by instruction that is assessment-guided and responsive (Ehri, 2020).

The National Reading Panel identified vocabulary as one of five major components of reading (NICHD, 2000). Vocabulary is generically defined as the knowledge of words and word meanings. More specifically, we use vocabulary to refer to the kind of words that students must know to read increasingly demanding text with comprehension (Kamil & Hiebert, 2005). The importance of vocabulary when it comes to overall academic success and more specifically to reading comprehension, is widely documented (Baker et al., 1998; Anderson & Nagy, 1991). The National Reading Panel states that vocabulary plays an important role both in learning to read and in comprehending text and that readers cannot understand text without knowing what most of the words mean.

Reading comprehension encompasses the process of finding meaning in text to construct a larger, deeper meaning within which the reader develops a relationship with what is being read (RAND Reading Study Group, 2002). To measure reading comprehension, a rational, purpose guided assessment system is needed and should include the capacity to identify individual students with poor comprehension (i.e., screening) and be able to identify subtypes of poor comprehension for the purposes of differentiating instruction (Snow, 2003). This approach also has the potential to become a more equitable measurement of reading comprehension by removing barriers to measurement, particularly for marginalized groups such as English language learners, students with disabilities, memory-load difficulties, or test anxiety. (Guerreiro et al., 2022).

When educators have access to timely data regarding their students' current learning needs, they are better able to help their students focus on the domains of reading that need the most support. Instructional supports that are adaptive to each student have the greatest likelihood of accelerating reading growth versus a one size fits all approach (Connor et al., 2014). The Science of Reading tells us that literacy skills work in tandem (Snowling & Hulme, 2005). To support growing readers, it's crucial to assess their understanding and provide targeted differentiation that addresses their areas of needed growth.

Reporting

A major goal of any valid assessment is to inform and improve student learning (Goatley, Dozier, and Puccioni, 2020). In keeping with that goal, the LSDA provides assessment scores and reports immediately following the completion of the assessments so that educators have access to real time data to inform future instruction for each student. This includes instructional strategies that help guide lesson plans and support the differentiation needed to reduce knowledge gaps.

Instructional Decisions, Next Steps, & Informed Instruction

To utilize timely, data-based information to develop student appropriate teaching plans, it is critical that educators identify high-quality assessment strategies capable of determining where students are in their learning. Using multiple data sources to monitor student learning, including observations from teachers, embedded formative assessments, classroom assessments, and district-wide interim/ benchmark assessments, increases the likelihood that students will receive the differentiation they need (Bernhardt, 2017; Kim & Davidson, 2019). For teachers this means assessment data and reports that can be used to design instruction, adjust curriculum, identify targeted supports, and create flexible student learning groups. Reports that provide meaningful information ensures that in-depth grade level instruction and the re-teaching of essential content from previous grades occurs simultaneously (Foster & Master, 2004).

While the Screener was designed to inform teachers about how best to use the Diagnostic Assessment, both Screener and Diagnostic data and the related reports can be used by teachers to facilitate planning instruction. Reports provide information on how students performed by each standard and question, as well as how students performed overall and recommendations for assigning resources from the Realize platform. Readily having access to current data is essential to creating beginning of year lesson plans, providing targeted instructional strategies, and addressing knowledge gaps and related curriculum planning throughout the year. With the LSDA, teachers get useful reports that positively impact instruction and makes whole class, group, and individual student planning easier.

Actionable Data and Targeted Resources

The LSDA Diagnostic provides actionable data and targeted resources to help teachers build towards mastery. Within the Diagnostic, helpful performance levels, and the cut scores used to define them, have been established using the Embedded Standard Setting (ESS) method. This peer-reviewed, research-based method supports the development of performance levels and cut scores that align with each state's summative assessment, as well as the estimation of criterion-referenced scores based on the Common Core State Standards (Lewis & Cook, 2020). Using ESS embedded standard setting, cut scores defining four levels of performance have been developed, from Level 1: Does Not Meet Expectations to Level 4: Exceeds Expectations. Each performance level has performance level descriptors (PLD) that aid score interpretation by describing the knowledge, skills, and abilities that each level represents. Cut scores for the Diagnostic have also been vertically articulated. There is a strong research base behind the coherence of vertically articulated scores (Cizek & Agger, 2012).

In practice, this means that the cut score for a given performance level (e.g., Level 1) increases with each grade level, so that students must improve their literacy abilities just to maintain the same performance level as they age. The design of the LSDA and associated reports streamlines the process of aligning teaching strategies to state standards and other desired learning outcomes. In addition to student and class level performance data, the LSDA provides teachers with recommendations for instructional support in each domain. The goal is to leverage student performance data from the Diagnostic Assessment to personalize instruction for each student so that gaps in knowledge and skills are addressed over the course of the school year (WestEd, 2022).

LSDA reporting features also include recommendations that are linked to the LSDA Resource Library which includes Small/Whole Group Lessons and Practice resources for each domain. At grades K-5, the small/whole group lessons include scaffolded reproducible student pages that allow teachers to introduce, model, and teach before guiding students through aligned practice. The Practice activities include printable worksheets and interactive activities. At grades 6-8, small/whole group lessons include explanations, examples, and definitions of academic vocabulary followed by graphic organizers. Practice activities are brief explanations of text analysis and vocabulary skills followed by short passage excerpts for students to read and answer questions about (Savvas, 2022). Teachers can access the reporting features and related recommendations throughout the year far beyond testing windows to ensure that students are meeting instructional targets and building literacy mastery.

Conclusion

To truly provide the kind of meaningful, differentiated learning opportunities each student needs, teachers must understand what a student knows and does not know, where they are struggling, and how they learn best (Earl, 2003). When educators identify and accommodate the unique interests, learning profiles and readiness levels of their students, they are better poised to help students make positive learning strides (Tomlinson, 2005). By addressing learner variance and maximizing instruction that is differentiated, teachers can readily leverage each student's greatest opportunity for growth (Subban, 2006; and Tomlinson, 2004c & 2005). LSDA helps teachers identify and utilize opportunities for personalized instruction with assessment tools, data, and reports that adapt to the unique needs of each student (Wells et al., 2016).

- Screening assessments provide the starting point for identifying students who may be at risk for falling behind in literacy and require additional interventions (Petscher et al., 2019).
- LSDA gives teachers a data driven tool to identify which strands need additional attention and helps them provide the instructional support to meet their students' needs when it comes to learning to read.
- Valid, reliable tests are particularly critical when assessments are used to make pedagogical decisions such as where to place a student, what interventions to use, or whether additional testing is needed (Pentimonti et al., 2017).
- Drawing on the Science of Reading best practices in literacy, the LSDA was created to bring curriculum, instruction, and assessment into alignment.
- The LSDA includes the following crucial domains: Comprehension, both Literature and Informational, including Listening Comprehension for levels K (PK domains included); Vocabulary; and Foundational Skills including Emergent Literacy, for levels K (PK domains included).
- The LSDA provides assessment scores and reports immediately following the completion of the assessments so that educators have access to real time data to inform future instruction for each student.
- With the LSDA, teachers get useful reports that positively impact instruction and makes whole class, group, and individual student planning easier.

Implementing the SAVVAS LSDA helps support beginning of year planning, provides seamless differentiation and targeted instruction and allows educators to better understand where students are at the beginning of the school year and throughout their learning journey. By utilizing adaptive technology, educators and leaders can access the kinds of impactful, data-driven approaches that are required to support their efforts for school improvement and student achievement goals for every learner (U.S. Dept. of Education, 2017). Pairing the power of data with instructional resources that are aligned to student literacy needs creates meaningful learning experiences for every type of learner and ensures the successes that come from being a lifelong reader and learner.

References

Afflerbach, P. (2012). Understanding and using reading assessment: K-12 (2nd Ed). Newark, DE: International Reading Association.

Allington, R. L. (2012). *What really matters for struggling readers*: *Designing research-based programs* (3rd ed.). Boston: Allyn and Bacon.

Anderson, R., & Nagy, W. (1991). Word meanings. In R. Barr, M. Kamil, P. Mosenthal, and P.D. Pearson, (Eds.), Handbook of Reading Research, Vol. 2, pp. 690–724. New York: Longman.

Baker, S., Lesaux, N., Jayanthi, M., Dimino, J., Proctor, C. P., Morris, J., Gersten, R., Haymond, K., Kieffer, M. J., Linan-Thompson, S., & Newman-Gonchar, R. (2014). Teaching academic content and literacy to English learners in elementary and middle school (NCEE 2014-4012). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from the NCEE website.

Baker, S., Simmons, D., & Kame'enui, E. (1998). Vocabulary acquisition: Synthesis of the research. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, Educational Resources Information Center.

Belafi, C., Hwa, Y.-Y., Kaffenberger, M., (2020). Building on Solid Foundations: Prioritising Universal, Early, Conceptual and Procedural Mastery of Foundational Skills.

Belov, D. I., & Armstrong, R. D. (2008). A Monte Carlo approach to the design, assembly, and evaluation of multistage adaptive tests. *Applied Psychological Measurement*, 32(2), 119- 137.

Bennett, J. (2017, Dec. 8). Assessment for learning vs. assessment of learning. Pearson. https://www.pearsonassessments.com/professional-assessments/blog-webinars/blog/2017/12/assessment-for-learning-vs--assessment-of-learning.html

Berger, S., Verschoor, A.J., Eggen, T.J., & Moser, U. (2019). Development and Validation of a Vertical Scale for Formative Assessment in Mathematics. *Frontiers in Education*.

Bernhardt, V.L. (2017). Data Analysis for Continuous School Improvement. New York, NY: Routledge. 10.4324/9781315101026

Biel, C.H., Conner, C., Abry, T., Williams, B.S., Tyree, L., Blackwell-Bullock, R. & Solari, E.J. (2020). How Does the Science of Reading Inform Early Literacy Screening? *University of Virginia Phonological Awareness Literacy Screening (PALS)*.

Black, P., & Wiliam, D. (2010). Inside the Black Box: Raising Standards Through Classroom Assessment. *Phi Delta Kappan* 92 (1): 81–90. DOI: 10.1177/003172171009200119.

Block, C., & Israel, S. (2005). Reading first and beyond: The complete guide for teachers and literacy coaches. Thousand Oaks, CA: Corwin Press.

Brookhart, S. M. (2011). Educational assessment knowledge and skills for teachers. Educational Measurement: Issues and Practice, 30, 3–12.

Buck, G. (2011). Assessing listening. Cambridge: Cambridge University Press.

Caravolas, M., Lervåg, A., Mikulajova, M., Defior, S., Seidlova-Málková, G., & Hulme, C. (2019). A Cross-Linguistic, Longitudinal Study of the Foundations of Decoding and Reading Comprehension Ability. *Scientific Studies of Reading*, 23(5). 1-17. 10.1080/10888438.2019.1580284.

Cizek, G. J., & Agger, C., A. (2012). Vertically moderated standard setting. In G. J. Cizek (Ed.), *Setting Performance Standards*: *Foundation, Methods and Innovatio*n (pp. 467–484). New York, NY: Routledge.

Connor, C.M., Alberto, P.A., Compton, D.L., O'Connor, R.E. (2014). Improving Reading Outcomes for Students with or at Risk for Reading Disabilities: A Synthesis of the Contributions from the Institute of Education Sciences Research Centers (NCSER 2014-3000). Washington, DC: National Center for Special Education Research, Institute of Education Sciences, U.S. Department of Education. This report is available on the IES website at https://ies.ed.gov/.

Cromley, Jennifer & Roger, Azevedo. (2007). Testing and refining the direct and inferential model of reading comprehension. Journal of Educational Psychology. 99. 311-325. 10.1037/0022-0663.99.2.311.

Cunningham, A., & Zibulsky, J. (2014). *Book smart*: *How to develop and support successful, motivated readers*. New York, NY: Oxford University Press.

Dadey, N., & Briggs, D.C. (2012). A Meta-Analysis of Growth Trends from Vertically Scaled Assessments. *Practical Assessment, Research and Evaluation*, 17, 14.

Davies, R. (2022). Understanding diagnostic assessment for struggling learners. *Differentiated Teaching*. https://www.differentiatedteaching.com/diagnostic-assessment-for-teachers/

Earl, L. (2003). *Assessment as learning: Using classroom assessment to maximize student learning*. Thousand Oaks, CA: Corwin.

Eberly Center (n.d.). *What is the difference between formative and summative assessment?* https://www.cmu.edu/teaching/assessment/basics/formative-summative.html

Ehri, L.C. (2020). The Science of Learning to Read Words: A Case for Systematic Phonics Instruction. *Reading Research Quarterly*, 55(S1), S45– S60. https://doi.org/10.1002/rrq.334

Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. (2010). Early Beginnings: Early Literacy Knowledge and Instruction (A Guide for Early Childhood Administrators & Professional Development Providers) (NA). Washington, DC: U.S. Government Printing Office.

Evans, D. K., & Hares, S. (2021). Should Governments and Donors Prioritize Investments in Foundational Literacy and Numeracy?. CGD Working Paper 579. Washington, DC: Center for Global Development. https://www.cgdev.org/publication/ should-governments-and-donors-prioritize-investments-foundational-literacy-andnumeracy

Fisher, D., & Frey, N. (2012). Close reading in elementary schools. *The Reading Teacher*, 66(3), 179–188.

Fisher, D., & Frey, N. (2014). Content Area Vocabulary Learning. *The Reading Teacher,* 67(8), 594–599. doi: 10.1002/trtr.1258

Florit, E., Roch, M., & Levorato, M. C. (2013). The relation between listening comprehension of text and sentences in preschoolers: Specific or mediated by lower and higher level components? *Applied Psycholinguistics*, 34, 395-415.

Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S., Streke, A., Wagner, R., & Wissel, S. (2016). Foundational skills to support reading for understanding in kindergarten through 3rd grade (NCEE 2016-4008). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from the NCEE website: http://whatworks.ed.gov.

Foorman, Barbara & Herrera, Sarah & Petscher, Yaacov & Mitchell, Alison & Truckenmiller, Adrea. (2015). The Structure of Oral Language and Reading and Their Relation to Comprehension in Kindergarten through Grade 2. *Reading and Writing*, 28. 10.1007/s11145-015-9544-5.

Forster, M. & Masters, G. (2004). Bridging the conceptual gap between classroom assessment and system accountability. *Yearbook of the National Society for the Study of Education*, 103(2) 51-73.

Fountas, I.C., and Pinnell, G.S. (2007). *The continuum of literacy learning, grades K-8: Behaviors and understandings to notice, teach, and support*. Portsmouth, NH : Heinemann.

Fuchs, L. S., & Fuchs, D. (2002). *What is scientifically-based research on progress monitoring?* (Technical report). Nashville, TN: Vanderbilt University.

Garrison, C., Ehringhaus, M.E., & Resources, A.A. (2011). Formative and Summative Assessments in the Classroom.

Gersten, R., Baker, S.K., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R. (2007). Effective Literacy and English Language Instruction for English Learners in the Elementary Grades: A Practice Guide (NCEE 2007-4011). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from https://ies.ed.gov/ncee.

Gersten, R., Compton, D., Connor, C.M., Dimino, J., Santoro, L., Linan-Thompson, S., and Tilly, W.D. (2008). Assisting students struggling with reading: Response to Intervention and multi-tier intervention for reading in the primary grades. A practice guide. (NCEE 2009-4045). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Gierl, M. J., & Haladyna, T. M. (2012). Automatic item generation: An introduction. In M. J. Gierl & T. M. Haladyna (Eds.), Automatic item generation: Theory and practice (pp. 3–12). New York, NY: Routledge.

Goatley, V.J., Dozier, C.L., & Puccioni, J. (2020). Using literacy assessments to improve student learning. In Dagen, A.S. & Bean, R.M. (Eds) *Best Practices of Literacy Leaders*. The Guilford Press. New York, NY.

Guerreiro, Meg; Barker, Elizabeth; and Johnson, Janice (2022). Measuring Student Reading Comprehension Performance: Considerations of Accuracy, Equity, and Engagement by Embedding Comprehension Items within Reading Passages. *Practical Assessment, Research, and Evaluation*, 27(11). DOI: https://doi.org/10.7275/ch8r-tx33 Available at: https://scholarworks.umass.edu/pare/vol27/iss1/11

Guskey, T.R. (2016). Comparison of a Rasch Model Scale and the grade-equivalent scale for vertical equating of test scores. *Applied Psychological Measurement*, 5(2), 187-201.

Hamilton, L., Halverson, R. Jackson, Ss, Mandinach, E., Supovitz, J., & Wayman, J. (2009). *Using student achievement data to support instructional decision making (NCEE 2009-4067)*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Han, K. (2020). Framework for Developing Multistage Testing With Intersectional Routing for Short-Length Tests. *Applied Psychological Measurement*, 44, 102 - 87.

Hattie, J. (2008). Visible Learning. Abingdon, Oxon: Routledge.

Hendrickson, A.E. (2007). An NCME Instructional Module on Multistage Testing. *Educational Measurement*: *Issues and Practice,* 26, 44-52.

Jang, Eunice & Wagner, Maryam. (2013). Diagnostic Feedback in the Classroom. 10.1002/9781118411360.wbcla081.

Jiang, Y., Gong, T., Saldivia, L.E. et al. (2021). Using process data to understand problem-solving strategies and processes for drag-and-drop items in a large-scale mathematics assessment. *Large-scale Assessments in Education*, 9(2). https://doi.org/10.1186/s40536-021-00095-4

Jiban, C. (2021, Aug. 19). The science of reading and balanced literacy: What you need to know. NWEA. https://www.nwea.org/resource-center/resource/the-science-of-reading-and-balanced-literacy-what-you-need-to-know/

Kamil, M. L., Borman, G. D., Dole, J., Kral, C. C., Salinger, T., & Torgesen, J. (2008). Improving adolescent literacy: *Effective classroom and intervention practices*: *A Practice Guide* (NCEE #2008-4027). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Kim, Y.S. G., & Davidson, M. (2019). Assessment to inform instruction: Formative assessment. Global Reading Network Critical Topics Series. Washington, D.C.: USAID. Prepared by University Research Co., LLC (URC) under the Reading within Reach (REACH) initiative for USAID's Building Evidence and Supporting Innovation to Improve Primary Grade Assistance for the Office of Education (E3/ED). Available at www.globalreadingnetwork.net.

Kim, Y.S. G., & Pilcher, H. (2016). What is listening comprehension and what does it take to improve listening comprehension? In R. Schiff & M. Joshi (Eds.), Handbook of interventions in learning disabilities (pp. 159-174). New York: Springer.

Kim, Y.S. G., & Wagner, R. K. (2015). Text (Oral) reading fluency as a construct in reading development: An investigation of its mediating role for children from Grades 1 to 4. *Scientific Studies of Reading*, 19, 224-242.

Kim, Y.S., & Phillips, B. (2014). Cognitive correlates of listening comprehension. Reading Research Quarterly, 49, 269-281.

Kim, Y.S., Wagner, R., & Lopez, D. (2012). Developmental relations between reading fluency 26 and reading comprehension: a longitudinal study from grade 1 to grade 2. Journal of Experimental Child Psychology, 113, 93-111.

Kintsch, Walter & Rawson, Katherine. (2008). Comprehension. 10.1002/9780470757642.ch12.

Kintsch, Walter. (2018). Revisiting the Construction—Integration Model of Text Comprehension and its Implications for Instruction. 10.4324/9781315110592-12.

Kosanovich, M., Phillips, B., & Willis, K. (2020). Professional Learning Community: Emergent Literacy: Participant Guide – Module 1: Print Knowledge (Sessions 1-3) (REL 2020-021). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Education Laboratory Southeast. Retrieved from https://ies.ed.gov/ncee/edlabs.

Kosanovich, M., Phillips, B., & Willis, K. (2020). Professional Learning Community: Emergent Literacy: Participant Guide—Module 1: Print Knowledge (Sessions 1–3) (REL 2021-045). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southeast. Retrieved from https://ies.ed.gov/ncee/edlabs.

Lane, H. B. (2014). *Innovation Configuration Evidence-Based Reading Instruction for Grades K-5*. https://ceedar.education.ufl.edu/tools/innovation-configurations/

Lepola, J., Lynch, J., Laakkonen, E., Silvén, M., & Niemi, P. (2012). The role of inference making and other language skills in the development of narrative listening comprehension in 4- to 6-year old children. *Reading Research Quarterly*, 47, 259-282.

Lewis, D.M., & Cook, R.E. (2020). Embedded Standard Setting: Aligning Standard-Setting Methodology with Contemporary Assessment Design Principles. *Educational Measurement: Issues and Practice*, 39, 8-21.

Loftus, S. M. & Coyne, M. D. (2013). Vocabulary instruction within a multi-tier approach. *Reading & Writing: Overcoming Learning Difficulties*, 29(1), 4-19.

Lunz, M. (1989). Constructing Examinations from Calibrated Items. *Rasch Measurement Transactions*, 3(2), 56-57. https://www.rasch.org/rmt/rmt32c.htm

Marzano, R. J. (2010). Teaching basic and advanced vocabulary: A framework for direct instruction. Boston, MA: Heinle.

McCardle, P., & Chhabra, V. (2004). *The voice of evidence in reading research*. Baltimore: Brookes.

McLean, J.E. & Rockwood, R.E. (1996). *Why we assess students--and how. The competing measures of student performance. The practicing administrator's leadership series*. Thousand Oaks, CA: Corwin Press.

Mesmer, H. (2019). *Letter Lessons and First Words: Phonics Foundations That Work.*

Missall, K., Reschly, A.L., Betts, J., McConnell, S.R., Heistad, D., Pickart, M., Sheran, C., & Marston, D. (2007). Examination of the Predictive Validity of Preschool Early Literacy Skills. *School Psychology Review*, 36, 433 - 452.

Mulyadi, D., Wijayatiningsih, T. D., Swaran Singh, C. K., & Prastikawati, E. F. (2021). Effects of technology enhanced task-based language teaching on learners' listening comprehension and speaking performance. *International Journal of Instruction*, 14(3), 717–736.

Munger, K.A. (2016). Types of Literacy Assessment: Principles, Procedures, and Applications. In K.A. Munger (Ed.), *Steps to Success: Crossing the Bridge Between Literacy Research and Practice* (p. 59-74). Open SUNY Textbooks.

National Center for Learning Disabilities (2020). *The Importance of Early Screening.* The-Importance-of-Early-Screening-1.pdf (ncld.org)

National Center on Improving Literacy (2022). Understanding screening. Washington, DC: U.S. Department of Education, Office of Elementary and Secondary Education, Office of Special Education Programs, National Center on Improving Literacy. https://improvingliteracy.org/kit/understanding-screening#:~:text=Screening%20is%20a%20type%20of,for%20reading%20difficulties%2C%20including%20dyslexia.

National Center on Improving Literacy (2019). Best practices in universal screening. Washington, DC: U.S. Department of Education, Office of Elementary and Secondary Education, Office of Special Education Programs, National Center on Improving Literacy. Retrieved from http://improvingliteracy.org.

National Council of Teachers of English (2018, Oct. 25). Literacy Assessment: Definition, principles and practices. https://ncte.org/statement/assessmentframingst/#:~:text=Literacy%20assessment%20provides%20students%20with,as%20self%2Dreflective%20literacy%20learners.

National Reading Panel (2000). Teaching Children to Read: An Evidence-Based Assessment of the Scientific Literature on Reading and its Implications For Reading. National Reading Panel - Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction (nih.gov)

National Research Council. (2001). *Knowing What Students Know: The Science and Design of Educational Assessment*. Washington, DC: The National Academies Press. https://doi.org/10.17226/10019.

New Meridian Resource Center (2019). ELA test design. https://resources.newmeridiancorp.org/ela-test-design/

Parshall, C.G. & Harmes, J.C. (2014). Improving the quality of innovative item types: Four tasks for design and development. Journal of Applied Testing Technology, 10 (1), 1-20. https://jattjournal.net/index.php/atp/article/viewFile/48349/39219

Pearson, P. & Hamm, Diane. (2005). The Assessment of Reading Comprehension: A Review of Practices-Past, Present, and Future.

Pearson, P. & Hiebert, Elfrieda & Kamil, Michael. (2007). Vocabulary Assessment: What We Know and What We Need to Learn. *Reading Research Quarterly*, 42, 282-296. 10.1598/RRQ.42.2.4.

Pentimonti, J. M., Walker, M. A., & Edmonds, R. Z. (2017). The selection and use of screening and progress monitoring tools in data-based decision making within an MTSS framework. *Perspectives on Language and Literacy*, 43(3), 34-40.

Petscher, Y., Pentimonti, J., & Stanley, C. (2019). Validity. Washington, DC: U.S. Department of Education, Office of Elementary and Secondary Education, Office of Special Education Programs, National Center on Improving Literacy.

Petscher, Y., Stanley, C., & Pentimonti, J. (2019). Overall screening and assessment. Washington, DC: U.S. Department of Education, Office of Elementary and Secondary Education, Office of Special Education Programs, National Center on Improving Literacy. Retrieved from improvingliteracy.org.

Phillips, B.M., Lonigan, C.J., & Wyatt, M. (2009). Predictive Validity of the Get Ready to Read! Screener. *Journal of Learning Disabilities*, 42, 133 - 147.

RAND Reading Study Group (2002). Reading for Understanding: Toward an R&D Program in Reading Comprehension. Santa Monica, CA: RAND Corporation.

RAND Reading Study Group, & Snow, C. (2002). DEFINING COMPREHENSION. In *Reading for Understanding: Toward an R&D Program in Reading Comprehension* (pp. 11–18). RAND Corporation. http://www.jstor.org/stable/10.7249/mr1465oeri.10

Savvas (2022). Savvas Literacy Screener & Diagnostic Assessments: User Guide. Savvas Learning Company.

Scarborough, H. (2018). Scarborough's reading rope. A ground-breaking infographic. *International Dyslexia Association Infographics*, 7(2). Available: https://dyslexiaida.org/scarboroughs-reading-rope-a-groundbreaking-infographic/

Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy* (pp. 97–110). New York, NY: Guilford Press.

Schumm, J. S. (2006). *Reading assessment and instruction for all learners*. New York: Guilford Press.

Shute, V.J., Leighton, J.P., Jang, E.E. & Chu, M. (2016). Advances in the Science of Assessment, *Educational Assessment*, 21(1), 34-59, DOI: 10.1080/10627197.2015.1127752

Siedlecki, J. (2012, May 12). Education testing assessment of learning versus assessment for learning. Michael & Susan Dell Foundation. https://www.dell.org/insight/education-testing-assessment-of-learning-versus-assessment-for-learning/

Skibbe, L. E., Bowles, R. P., Goodwin, S., Troia, G. A., & Konishi, H. (2020). The access to literacy assessment system for phonological awareness: An adaptive measure of phonological awareness appropriate for children with speech and/or language impairment. *Language, Speech, and Hearing Services in Schools*, 51(4), 1124–1138.

Snow, C. E. (2003). Assessment of reading comprehension: Researchers and practitioners helping themselves and each other. In Sweet, A.P. & C.E. Snow (eds.), Rethinking reading comprehension. New York: Guilford Press.

Snowling, M. J., & Hulme, C. (Eds.). (2005). *The science of reading: A handbook*. Blackwell Publishing.

St. Martin, K., Vaughn, S., Troia, G., Fien, H., & Coyne, M. (2020). *Intensifying literacy instruction: Essential practices*. Lansing, MI: MiMTSS Technical Assistance Center, Michigan Department of Education.

Tangel, D. M., & Blachman, B. A. (1995). Effect of Phoneme Awareness Instruction on the Invented Spelling of First-Grade Children: A one-year Follow-Up. *Journal of Reading Behavior*, 27(2), 153–185. https://doi.org/10.1080/10862969509547876

The IRIS Center. (2006). RTI (part 2): *Assessment*. Retrieved from https://iris.peabody.vanderbilt.edu/module/rti02-assessment/

Tomlinson, C. A. (2004). Sharing responsibility for differentiating instruction. *Roeper Review*, 26(4), 188-200.

Tomlinson, C. A. (2005). Grading and differentiation: Paradox or good practice? *Theory into Practice*, 44(3), 262-269.

Tompkins, V., Guo, Y., & Justice, L. M. (2013). Inference generation, story comprehension, and language in the preschool years. *Reading and Writing: An Interdisciplinary Journal*, 26, 403-429.

Tong, Y. & Kolen, M.J. (2008, March). Maintenance of Vertical Scales [Paper presentation]. National Council on Measurement in Education, New York, NY.

Torgesen, J. K. (2006) *A comprehensive K-3 reading assessment plan: Guidance for school leaders*. Portsmouth, NH. RMC Research Corporation, Center on Instruction https://www.fcrr.org/assessment/pdf/K-3%20Reading%20assessment.pdf

U.S. Department of Education, Office of Educational Technology. (2017). Reimagining the Role of Technology in Education: 2017 National Education Technology Plan Update. Washington, D.C. Retrieved from https://tech.ed.gov/files/2017/01/NETP17.pdf

Wells, A., Fox, L. & Cordova-Cobo, D. (2016). How Racially Diverse Schools and Classrooms Can Benefit All Students. *The Education Digest*, 82.1: 17

WestEd (2022). Assessment Literacy Workshops: Promoting Understanding of Assessment and the Effective Use of Summative Test Results Among K-12 Educators. WestEd. https://www.wested.org/service/assessment-literacy-workshops/

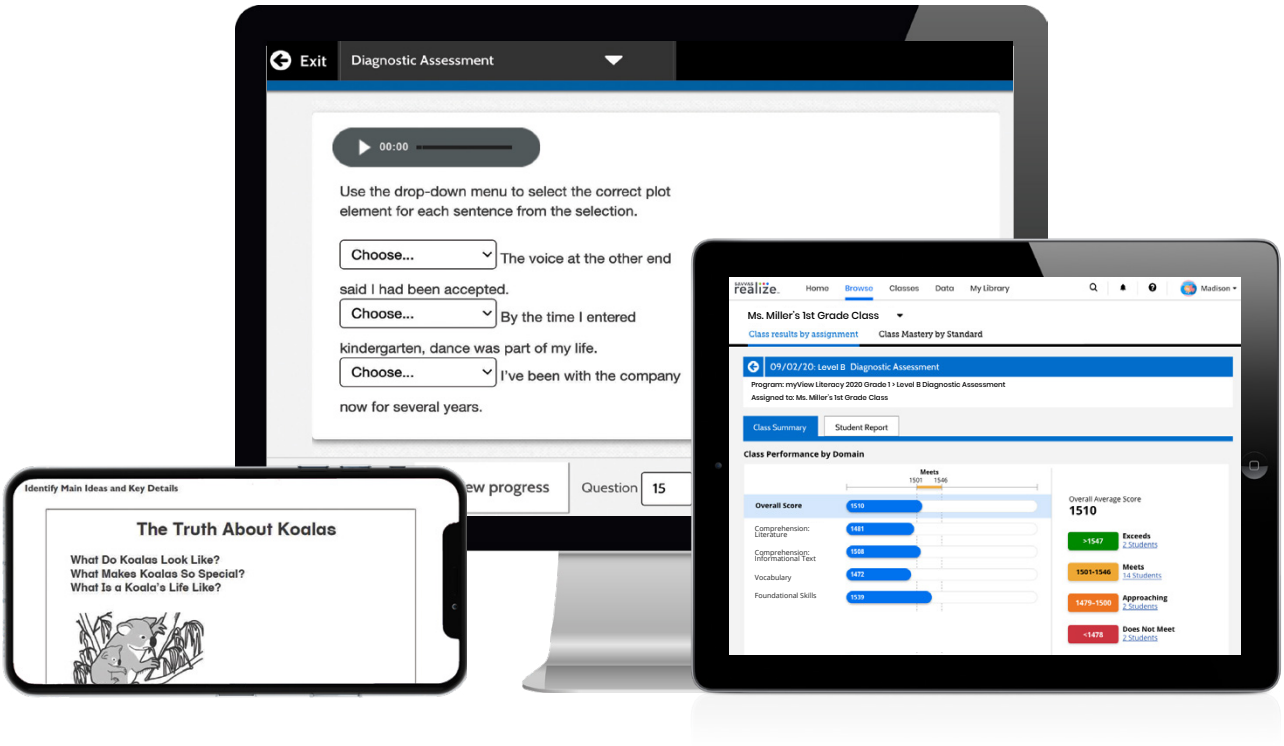
WestEd (2022). Savvas Literacy Screener and Diagnostic Assessment (LSDA) 2022 technical report.

Wood, G. H., Darling-Hammond, L., Neil, M., & Roschewski, P. (2007). Refocusing Accountability: Using Local Performance Assessments to Enhance Teaching and Learning for Higher Order Skills. Amesville, Ohio: Forum for Education and Democracy.

Yekeler, A.D., & Ulusoy, M. (2020). The Relationship Among Listening Comprehension And Factors Affecting Listening. Education and Science.

Zheng, Y. & Nozawa, Y. Xiaohong, G. & Chang, H. (2012). Multistage adaptive testing for a large-scale classification test: Design, heuristic assembly, and comparison with other testing modes. ACT Research Report Series. https://www.act.org/content/dam/act/unsecured/documents/ACT_RR2012-6.pdf

SAVVAS literacy Screener & Diagnostic Assessments



Learn more at Savvas.com/LSDA

Photography: Shutterstock

0523.JA.MJ.581111522

SAVVAS LEARNING COMPANY

Savvas.com
800-848-9500

Join the Conversation
@SavvasLearning

Get Fresh Ideas for Teaching
Blog.Savvas.com