MAP Reading Fluency with Coach Evidence Base

2024

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Introduction

Persistent trends of declining or stagnant reading proficiency among fourth- and eighth-grade students in the US highlight the need for effective evidence-based reading instruction that meets the needs of students and teachers (US DOE, 2019). Over the past few decades, educational technology for reading and language learning has become an integral component of literacy instruction. Today, the use of software programs, mobile applications, interactive websites, and video-based platforms for language and literacy learning in K–12 classrooms is a promising means of increasing student achievement in reading.

Modern advances in computer science, machine learning, and artificial intelligence (AI) coupled with literacy instruction have led to the development of MAP® Reading Fluency™ with Coach, an automated AI–powered reading tutor that delivers targeted instruction, practice, and assessment in early learners' literacy skills.

This document highlights the foundational research supporting MAP Reading Fluency with Coach. It provides an overview of the research underlying MAP Reading Fluency with Coach's AI–powered intelligent reading tutor and the research on key elements of early literacy instruction. It describes the components of the MAP Reading Fluency with Coach pedagogy and the research base supporting each component. The paper also outlines the role of professional development in empowering teachers to effectively integrate MAP Reading Fluency with Coach into the class flow.

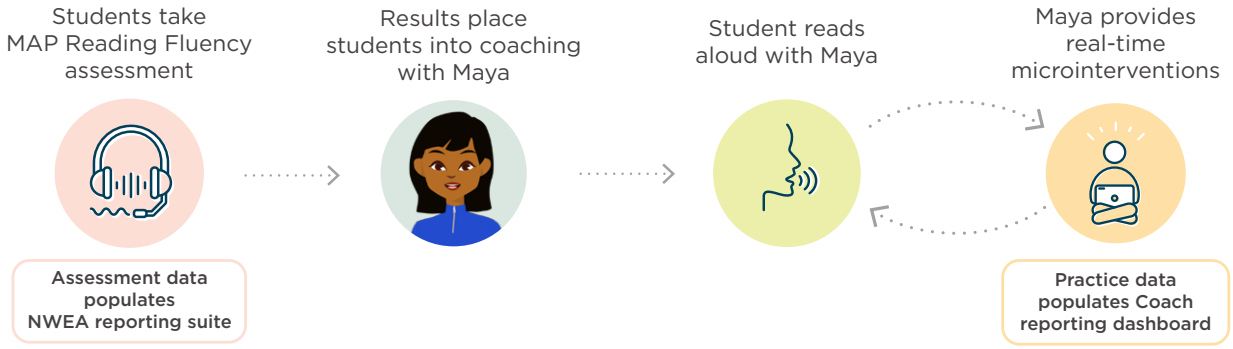
Program overview

An integrated solution

NWEA's newest integrated solution, MAP Reading Fluency with Coach, delivers a K–5 reading assessment and tutoring solution designed to improve student reading growth. Aligned to the science of reading, this solution assesses a student's reading level and places them in a personalized 1:1 reading tutoring pathway based on where they are in their reading journey.

Together, this integrated solution of MAP products provides NWEA® partners with unique insights to make data-informed decisions that guide instruction and intervention.

How it works

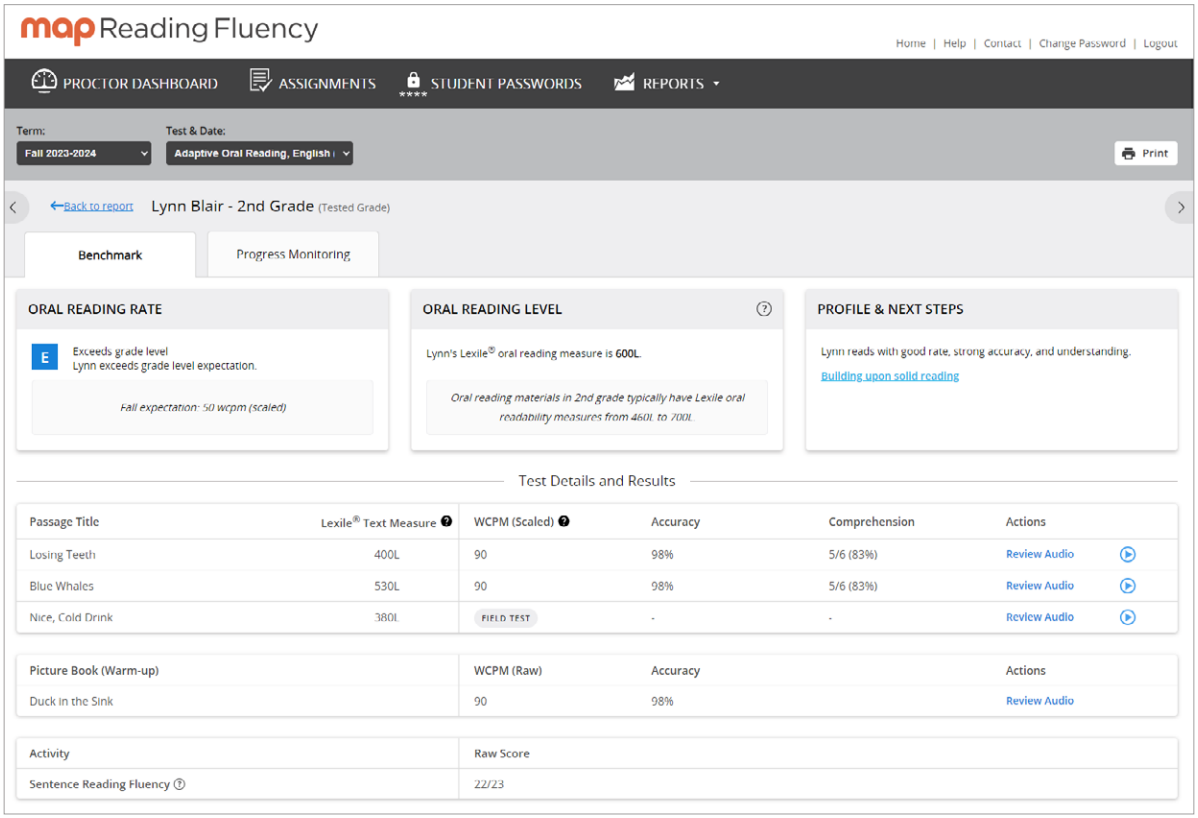


A better way to evaluate early reading

MAP Reading Fluency assessment allows teachers to quickly and accurately assess pre-K–5 readers and enables teachers to efficiently measure oral reading fluency with an online, adaptive benchmark and progress-monitoring assessment. Aligned to the science of reading, the test measures foundational skills, literal comprehension, language comprehension, and fluency. Group testing and automatic scoring return valuable time to teachers. Streamlined universal and dyslexia screening identifies students with possible risk factors for reading difficulty, including dyslexia.

ADAPTIVE SCREENING	DYSLEXIA SCREENER*	PROGRESS MONITORING*
The adaptive benchmark test meets readers at their mastery level. Younger readers are tested on foundational skills, while more advanced readers receive reading passages and comprehensive questions.	Included with MAP Reading Fluency, the dyslexia screener provides a way to easily assess every child in grades K–3 for common indicators of dyslexia or other reading difficulties.	Brief assessments for oral reading and foundational skills utilize automated speech-scoring technology for more frequent measures for students at risk of reading difficulties. This includes older students who may still be working on essential literacy skills.

** Dyslexia screener and progress monitoring are available for MAP Reading Fluency English only.*



Personalized reading experience with Coach

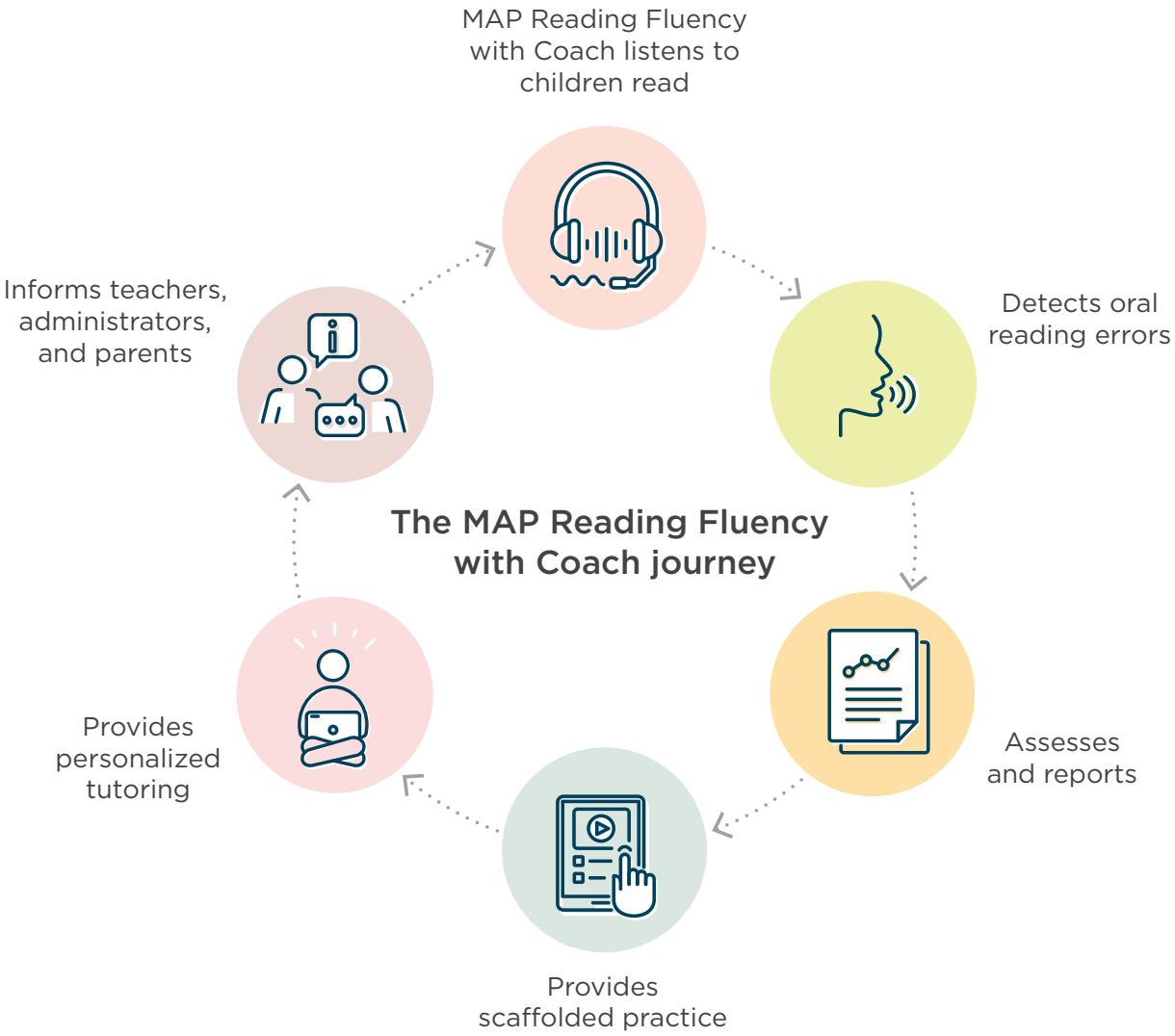
After students complete the MAP Reading Fluency benchmark assessment, Coach takes their assessment data and places them into 1:1 personalized tutoring tracks based on where they are in their reading journey. As they practice reading, the tutoring program actively listens to students read aloud and detects oral reading errors to deliver real-time microinterventions like reading along, lip-syncing, and rhyming words that strengthen critical foundational skills.

Effective 1:1 reading tutoring

Coach Maya listens while a student reads out loud to assess and report on their skills across the key pillars of reading. Coach enables oral reading practice, and students receive personal tutoring attention, which is proven to be as effective in improving student outcomes as time with a human tutor.

Perfectly timed microinterventions

Coach employs dozens of microinterventions to help students build foundational reading skills in English and Spanish. Microinterventions are aligned to the reading rope, and each one is a “scaffold” that supports early readers.


MAP Reading Fluency with Coach listens to children read
Detects oral reading errors
Assesses and reports
Provides scaffolded practice
Provides personalized tutoring
Informs teachers, administrators, and parents
The MAP Reading Fluency with Coach journey

Theoretical framework for MAP Reading Fluency with Coach

Technology has permeated classrooms and schools within the past decade at a rapid rate, transforming the way students learn, educators teach, and administrators manage resources and interpret data. Increased numbers of tablets and laptops in the hands of students, enhancements made on mobile devices, inclusion of multimedia on websites, and the infusion of social media in students' daily lives have altered the very nature of reading. Traditional print books are steadily being replaced by eBooks, audiobooks, online news sources, and even voice-controlled intelligent personal assistant services that provide an immediate answer to a spoken question. In these ways, students access text through more modalities than in the past.

Advances in the fields of artificial intelligence, human-computer interaction and hardware systems, and the development of "intelligent" computer-based assessments and instruction, now known as the Intelligent Tutoring System, have evolved from computer laboratories and are steadily being implemented into mainstream classrooms.

Artificial intelligence and literacy instruction

Artificial intelligence scientists have been developing intelligent machines that can perform functions such as speech recognition, adaptive learning, and advanced problem solving. Artificial intelligence is increasingly being integrated with common technology used within our daily lives, particularly embedding speech-recognition software into smart phones, smart watches, smart speakers, and smart cars, to name a few. Although artificial intelligence has been researched since the 1940s in academic laboratories, its application into mainstream schools and Tier 1 classrooms within the past two decades has become more widespread, showing promising results. In the area of literacy, AI tools hold great potential, especially for developing students' reading and writing proficiency.

Recent market research predicts that the use of AI in the field of education will grow 47.5% through 2021 (Research and Markets, 2018). One of the driving forces of the widespread uses of AI in education is providing students with adaptive learning paths and integrating AI in educational games to enhance interactivity and motivation. There are numerous ways AI has the potential to transform the educational landscape (eSchool News, 2017; Utermohlen, 2018):

- **Automation of administrative tasks:** Grading homework, accessing students' multiple-choice assessments, and evaluating writing assignments are time-consuming tasks for educators. AI software that can expedite these tasks, archive students' data, and report on students' progress frees up teachers' time to focus on students who need more one-on-one or small-group instruction.
- **Addition of smart content:** AI can help digitize textbooks or create customizable, learning digital interfaces that apply to students of all age ranges and grades.
- **Smart tutors and personalized instruction:** Professors and teachers may have limited time, but smart tutoring systems allow all students within a classroom to have access to a tutor that provides individualized instructional support.
- **Universal access for all students:** AI tools allow students with specific disabilities to access instructional content using features such as text-to-speech, speech-to-text, translations, etc.
- **Out-of-school time (OST) instruction:** AI software can allow students to access digital content and instruction outside of school hours. Extending instruction time can assist students who need additional practice or support students in a remote learning environment.

When AI software is implemented effectively within a classroom and students are engaged with online practice on the computer, the classroom teacher is freed to concentrate efforts on individual student needs or to provide targeted small-group instruction. Because AI-based software provides teachers with electronically collected and organized information about students' individual work, the data can be extremely useful for individualizing instruction.

Automated speech recognition and literacy instruction

A significant technological advance that has enabled the development of intelligent reading tutors is automated speech recognition software, which listens to users' oral reading and then provides context-specific feedback (Mostow & Aist, 2001). Automated speech recognition software has shown to be a promising digital technology to enhance students' reading proficiency, particularly in the following areas (Mostow & Aist, 1999):

1. **Word identification:** Children often misread a word or cannot identify it at all. Young children often lack the metacognitive skills required to realize when they need help. Technologies using automated speech recognition software "listen" to the student's miscue and provide immediate feedback by speaking (or giving a hint for) a word that the child gets stuck on, clicks on for help, misreads, or is likely to misread based on previous error patterns.

2. **Attention:** When emergent readers are reading word-for-word, or sometimes letter-by-letter, they are not able to attend to the meaning of the sentence or text. The technology using the automated speech recognition software is able to detect the disfluent reading and provide appropriate scaffolded supports. These supports allow students to reread the sentence more fluently, thus freeing up the students' cognitive load to attend to the meaning of the text.

3. **Motivation:** Students who have difficulty reading often struggle with motivation to read. Striving students typically do not like to read aloud; the usage of the automated speech recognition software allows the students to have an attentive, perceptive, and responsive audience without judgment, thus providing a safe environment for students to practice and improve their oral reading.

MAP Reading Fluency with Coach's automated speech recognition capabilities stem from decades of Project LISTEN research in continuous speech recognition (Huang et al., 1993), speech analysis techniques (Mostow et al., 1994), and interactive educational multimedia design (Mostow et al., 1995). Using speech samples from fluent adult speakers and from children, Project LISTEN researchers have generated models of fluent oral reading and identified specific syntactic and lexical features of text that can be used to predict fluency and comprehension and to identify targets for instructional intervention and remediation (Mostow, 2012; Sitaram & Mostow, 2012).

Intelligent tutoring systems and literacy instruction

Advances in computer science and artificial intelligence gave rise to "intelligent" computer-based instruction programs beginning in the 1970s (Corbett et al., 1997). Traditionally, human tutors are experts that hold deep knowledge and understanding of a subject matter domain and also of students learning goals (Reed & Meiselwitz, 2011). Modeled on effective human tutors, **intelligent tutoring systems** are computer software programs that use AI to provide a personalized, adaptive, and interactive learning experience within a one-on-one tutor-student relationship. Like human tutors, intelligent tutoring systems seek to engage students in sustained learning activities and to interact with each student based on a deep understanding of individual needs and preferences (Anderson, 1982; Corbett et al., 1997).

Advantages of intelligent tutoring systems

Researchers from the fields of cognitive psychology and computer science have long been interested in the differences between human tutors and intelligent tutoring systems. Studies have demonstrated significant improvements in students' literacy achievement for one-on-one literacy tutoring (Snow et al., 1998). Some characteristics of individualized tutoring are as follows:

- Individualized tutoring entails extra time on reading (e.g., 30 minutes daily for much or all of a school year).
- Not all tutoring programs are effective and sufficient.
- The effectiveness of tutors can be dependent upon training and supervision of tutors.
- A key element of effective tutoring is reading connected, engaging text. Extensive assisted oral reading of connected text has been shown to improve overall reading ability, general cognitive processing, and accumulation of background knowledge (Cunningham & Stanovich, 1997).
- Other activities common to effective tutoring include word study and writing.
- Gains by tutored children compared to control groups persist on measures specific to the treatment, yet without extending to other aspects of reading performance.

Individual human tutoring demonstrates positive effects with specific reading and writing tasks, and many times, the benefits are long-lasting.

However, studies of the behavior of human tutors show that they are less likely to ask questions designed to diagnose students' misconceptions (McArthur et al., 1990), to know which false beliefs their students held (Chi et al., 2004), and to change their behavior and practices when given detailed diagnostic information about their students' misconceptions and false beliefs (Sleeman et al., 1989). Studies found high variability in human tutors' behaviors toward their students, as compared to intelligent tutors that had been programmed for consistency (Reeder et al., 2015). Therefore, human tutoring is time-consuming, variable in its quality of instruction, and likely extremely expensive.

Fortunately, advances in technology that assist in enhancing students' literacy skills provide a robust and cost-effective method to help achieve reading success—namely, automated individual literacy tutoring (Mostow et al., 2003). In a study measuring the effectiveness of an intelligent reading tutor 20 minutes a day compared to 30 minutes or more a day with a human tutor over a six-week period, results demonstrated that the group with the intelligent reading tutor offered time efficiencies over conventional human tutoring (Reeder et al., 2015).

Children with reading difficulties often fail to realize when they misidentify a word. This problem is especially prominent in striving readers and children with weak metacognitive skills. Therefore, intelligent reading tutors have the ability to detect students' errors while reading connected text and can, therefore, provide the support the students need as they're reading.

Therefore, study findings highlight ways in which AI-powered intelligent tutoring systems can serve to improve efficiency and reduce inconsistencies in the delivery of remediation and intervention in core academic subjects (Reed & Conklin, 2005).

Use of the avatar in intelligent tutoring

MAP Reading Fluency with Coach uses an AI-powered avatar named Maya to communicate and interact with students on the platform. An avatar is an animated pedagogical agent that interacts with students and helps them learn by providing hints, clues, feedback, and instruction (McNamara et al., 2010). Research has shown that the use of an avatar in online and virtual learning environments provides a degree of social presence and creates a sense of community for learners (Annetta & Holmes, 2006) and that social presence is a strong indicator of participants' satisfaction with computer-mediated communications (Allmendinger, 2010; Gunawardena & Zittle, 1997). By using realistic avatars that communicate with students via expressions, gestures, and visuals, intelligent tutoring systems can enhance human-computer interactions and thus increase student-tutor engagement (Basori et al., 2011).

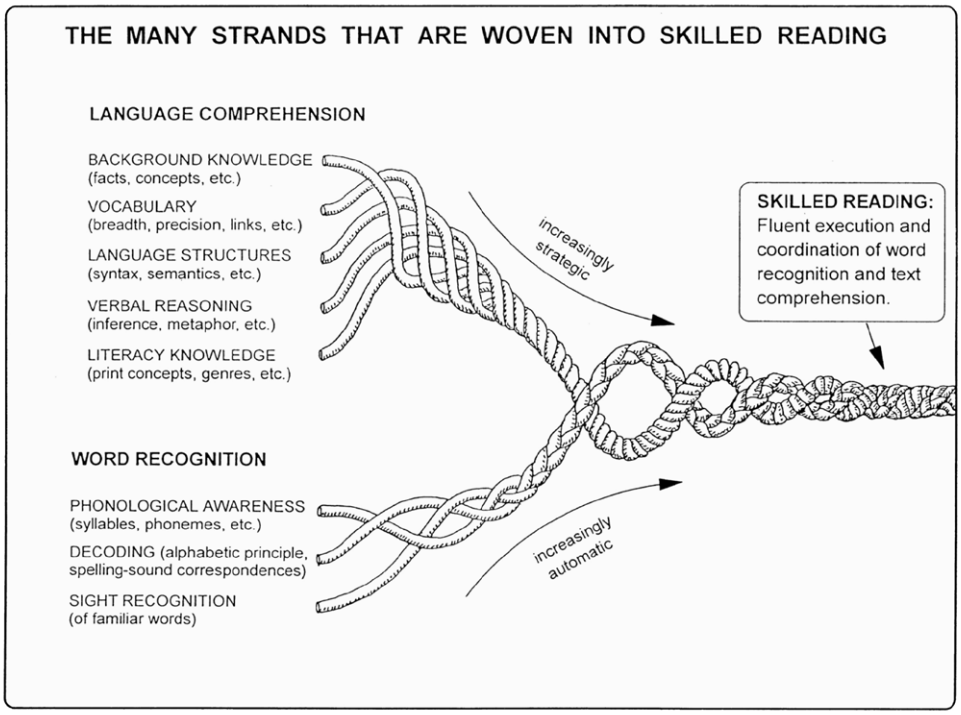
Theoretical framework for reading instruction

Simple View of Reading

The **Simple View of Reading** is a prominent theory of reading development that was proposed by educational psychologists Philip Gough and William Tunmer in 1986. According to the Simple View of Reading, reading comprehension is the product of word recognition and language comprehension. In order to read with comprehension, readers must simultaneously decode the words on a page while drawing on their knowledge of language to access the meaning of the text. **Decoding** involves connecting the spellings in words to their sounds and putting them together in order to read.

The Reading Rope

In 2001, reading scientist Hollis Scarborough elaborated on the simple view framework to develop the **Strand Model of Skilled Reading**—also referred to as the **Reading Rope**. According to the Strand Model, each component of the Simple View of Reading—word recognition and language comprehension—is itself a multifaceted skill. The word recognition strand encompasses phonological awareness, decoding, and sight recognition, while the language comprehension strand includes background knowledge, vocabulary, language structures, verbal reasoning, and literacy knowledge. Given instruction and practice, the word recognition skills become more automatic while the language comprehension skills become increasingly strategic.



The image, used with permission from the publisher, originally appeared in the following publication: 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 of early literacy research *(Vol. 1, pp. 97–110). Guilford Press.*

The MAP Reading Fluency with Coach pedagogy

MAP Reading Fluency with Coach uses the power of automated speech recognition and artificial intelligence technology to assess and report on students' skills across the essential elements of reading and to enable oral reading practice supported by a variety of microinterventions tailored to each individual student's specific needs. Each microintervention is a scaffold that helps an emerging reader improve skills that MAP Reading Fluency assessments have identified as needing more work toward mastery. This system connects assessment, reporting, instruction, and practice to help teachers understand the impact of their instruction and determine how to target instruction to students' needs in an iterative, data-driven cycle (Pellegrino, 2014; Wiliam, 2014). This section describes the research underlying the essential elements of the MAP Reading Fluency with Coach pedagogy: assessment, reporting, differentiated instructional recommendations, and individual practice supported by microintervention scaffolds.

MAP Reading Fluency with Coach assessment, reporting, and recommendations

Oral reading fluency assessment

Reading fluency is accurate, expressive reading at a rate appropriate for enabling comprehension. Oral reading fluency is a measure of the number of words a student can read aloud correctly and with natural ease per minute (Valencia et al., 2010). Measures of words correct per minute (wcpm)—also commonly referred to as running records—are used by literacy and language teachers across the United States to assess oral reading fluency in elementary school students (Armbruster, 2010; Hasbrouck & Tindal, 2006; Manzo, 2007). Fluency is an essential early literacy skill that has been described as a "bridge" between decoding and comprehension, enabling readers to shift their cognitive resources away from decoding and toward constructing meaning from text (Pikulski & Chard, 2005). Over time, the oral reading fluency assessment has become key to identifying at-risk students, placing students in remediation or special education, improving instructional programs, and predicting performance on high-stakes assessments (Klein & Jimerson, 2005; McGlinchey & Hixson, 2004).

How MAP Reading Fluency with Coach aligns with the research

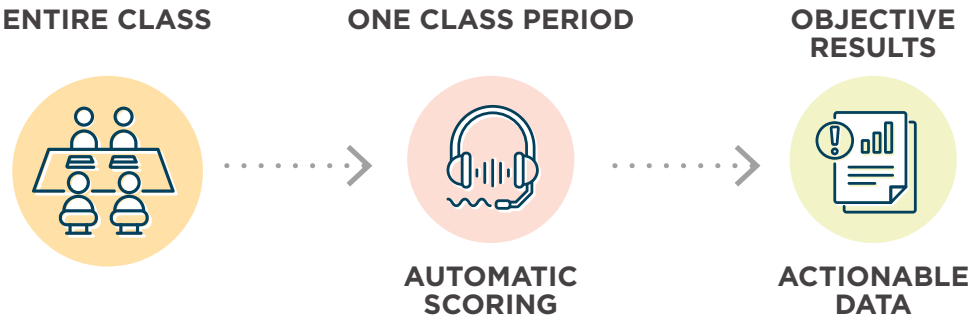
MAP Reading Fluency is an online assessment designed for beginning readers, grades pre-K to 5, measuring foundational skills, literal comprehension, language comprehension, oral reading fluency, and foundational skills and also serves as a dyslexia screener. Speech-recognition technology allows automatic scoring of students' oral reading recorded for playback. MAP Reading Fluency allows for testing a whole class or large groups of students simultaneously and takes one class period to complete, giving teachers increased time for instruction. It includes four benchmark tests and a 5- to 10-minute progress-monitoring tool that may be administered as often as needed.

Offered in foundational skills and oral reading, these brief assessments may be given as often as needed. Automated speech-scoring technology allows for more frequent oral reading testing for students at risk of reading difficulties, including older students who may still be working on essential literacy skills. Foundational skill progress monitoring includes phonological awareness, phonics, and word recognition.

MAP Reading Fluency is a fun and interactive assessment that takes the stress out of reading tests. Early learners have a friendly, animated guide and a colorful interface to keep them engaged. Affirmations are also provided for students as they take the test to maintain a positive testing experience.

MAP Reading Fluency:

- Benchmark/screening three times per year
- Frequent progress monitoring in foundational skills and oral reading for at-risk students
- Available in English and Spanish
- Includes an optional K–3 dyslexia screener
- Complements MAP Growth™
- Provides holistic view: fluency with comprehension in addition to foundational skills profile
- Adaptive test design provides efficient universal screening with actionable data for high, low, and typical performers
- Identifies an oral reading level or foundational skills profile for each reader
- Aligned to growth in reading: text complexity increases for fluent readers
- Onsite or remote testing



Dyslexia screener

Early Identification. Research shows that early screening and detection is critical for students with reading difficulties. There is wide consensus among researchers and educators about the importance of administering screening tests as students first enter school and again at the beginning and middle of each year from kindergarten through grade 3 (Gersten et al., 2008). Early and frequent screening using high-quality instruments that are efficient, reliable, and valid are needed to provide timely identification of students who might be at risk for reading failure, learning disabilities, and/or dyslexia (Washington et al., 2010). Repeated administrations of screening tests help schools track students' progress and rate of growth, adjust instruction as needed, and provide additional services to prevent later problems (Gersten et al., 2008).

Prevention and Intensive Intervention. Petscher and colleagues (2019) state that early screening and intervention services are critical for students with undiagnosed literacy-related disabilities, including dyslexia. Effective prevention and early reading intervention services should focus on the literacy-related problems. This includes providing intervention to students who are not yet diagnosed with literacy-related disabilities, including dyslexia, as well as those students who are experiencing literacy-related difficulties for other underlying reasons (Shaywitz & Shaywitz, 2020). Students' reading skills are developed and established in the early elementary years and are stable over time unless additional support and interventions are supplied to accelerate students' literacy growth (Petscher et al., 2019; Torgesen, 2000). Longitudinal data suggest that reading interventions that begin prior to the third grade are more effective

than those that begin later in students' schooling (Juel, 1988; Torgesen et al., 2010). No matter the cause of the literacy issues (e.g., dyslexia, other learning disabilities, low oral language skills, etc.), early, systematic, and intensive intervention is the best solution to prevent long-term effects of reading difficulties over a period of the students' schooling and lifespan (Connor et al., 2014).

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency's dyslexia screener offers effective dyslexia screening for students in grades K–3. Using a multivariate predictive model, the screener flags students who may be having difficulty with reading and may require further diagnostic testing. The dyslexia screener is a computer adaptive test assessing key foundational reading skills, including those most often associated with dyslexia. While it provides actionable data to inform instruction, it also identifies which skill areas may need further exploration to reveal a more detailed look at student understanding. Like the MAP Reading Fluency benchmark tests, students are assessed in an efficient, engaging, and developmentally appropriate way in one class period.

SKILL AREA	DESCRIPTION	MAP READING FLUENCY DYSLEXIA SCREENER MEASURES
Phonological and phonemic awareness	The ability to recognize and manipulate sounds in spoken language. Phonemic awareness is a subset of phonological awareness and refers to the specific ability to focus on and manipulate individual sounds (phonemes) in spoken words.	• Rhyme completion • Counting syllables • Initial sound matching • Onset-rime blending • Blending phonemes • Phoneme counting • Phoneme addition/deletion • Phoneme substitution
Sound symbol recognition	The ability to match the letters of written language to the sounds of spoken language.	• Letter sound fluency
Alphabet knowledge	The ability to name letters and distinguish letter shapes.	• Letter knowledge
Decoding	The process of translating print into speech by rapidly matching a letter or a group of letters to their sounds.	• Word families: initial letter • Decoding: CVC • Decoding: single syllable • Sentence reading fluency
Encoding	The process of translating phonological information (sounds) into symbols (a letter or group of letters). Encoding is commonly referred to as spelling.	• Building words: one letter • Building words: CVC • Building words: single syllable
Rapid naming	The ability to quickly retrieve and encode phonological information into spoken words.	• Rapid naming (objects)*
Vocabulary	Knowledge of word meanings.	• Picture vocabulary
Language comprehension	The ability to understand spoken language, measured by matching pictures to spoken sentences.	• Listening comprehension

** Note: Rapid automatized naming of objects is not an input into student flagging. It is an additional data point to be examined.*

Reporting and recommendations

MAP Reading Fluency provides practical, easy-to-use reports to help educators advance reading development for all their students.

Screener data clearly flags students who might need additional intensity, and evidence-based next steps are suggested through narrative and directly linked instructional resources.

Benchmark and progress-monitoring data provide clear feedback on what is working and where a change is needed.

Student reports present instructional reading level, performance compared with grade-level expectations, and suggestions for instructional next steps tailored to each student.

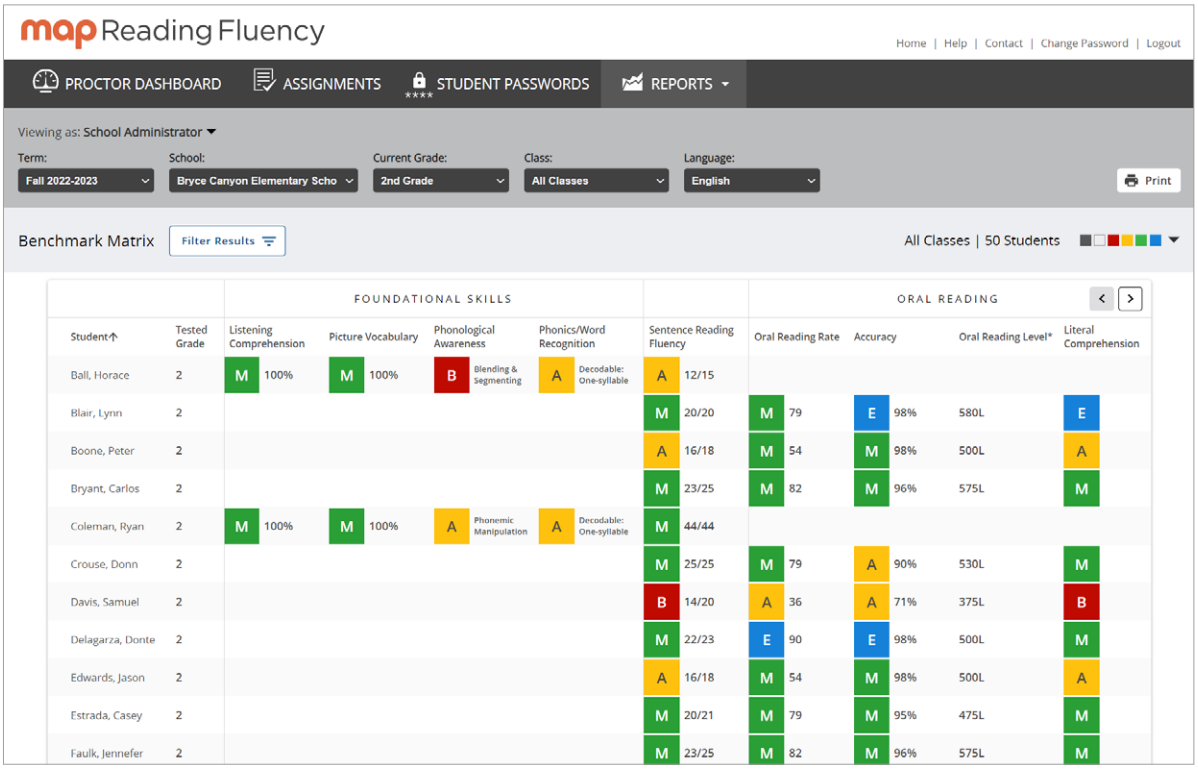
Class, school, and district reports offer results for grouping students, differentiating instruction, and informing program-level decisions.

List of MAP Reading Fluency reports

REPORT NAME	DESCRIPTION
STUDENT-LEVEL REPORTS	
Individual Student report: Foundational skills	Provides level of performance in phonological awareness, phonics and word recognition, vocabulary, and listening comprehension. Includes a student profile and next steps, including tailored links to instructional activities.
Individual Student report: Oral reading	Presents words-correct-per-minute, accuracy, and comprehension results for each passage read aloud. Includes a Lexile® oral reading level, a reader profile, and research-based next steps.
Individual Student report: Progress monitoring	Plots progress-monitoring results on a line graph using scaled domain scores.
CLASS-LEVEL REPORTS	
Screener Outcomes	Presents screener outcomes, scaled domain scores, and user norms in a streamlined format to help educators easily analyze the data and make better-informed decisions about allocating limited intervention resources.
Instructional Planning	Provides class- and student-level insights on foundational skills performance from benchmark tests to help teachers more efficiently plan instruction.
Benchmark Matrix	Presents performance levels for students across all completed domains.
Progress Monitoring dashboard	Provides at-a-glance information on all progress-monitoring assignments.
GRADE-, SCHOOL-, AND DISTRICT-LEVEL REPORTS	
Term Summary	Summarizes performance for all students in a given school or grade acorss the major reporting categories. For classrooms that complete the dyslexia screener, a new chart represents the aggregate student outcomes.
Term Comparison	Compare student performance across multiple terms.
Testing Progress	Provides the percentage of tests completed for the testing term, school, grade(s), class(es), and language selected.
DATA EXPORTS	
Data export	Exports district test results to .CSV files to enable importing into a database creating custom reports and more.

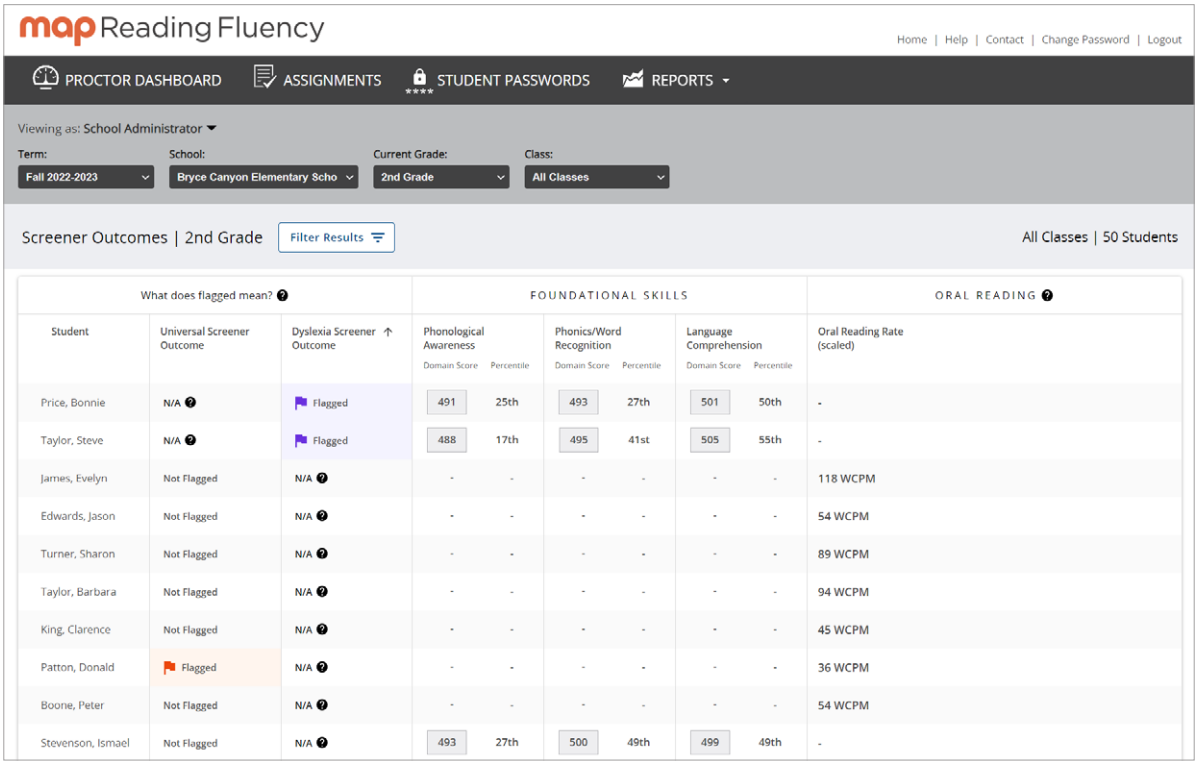
Benchmark Matrix report

The Benchmark Matrix details student performance outcomes on benchmark expectations by grade and term. These student outcomes identify if students are meeting, exceeding, approaching, or below expectations in foundational skills and/or oral reading. Teachers can sort this data to consider tiered groupings by like-performing students in different domains and prioritize which students may need immediate 1:1 attention. The data can also be easily sorted by English and Spanish testing data.



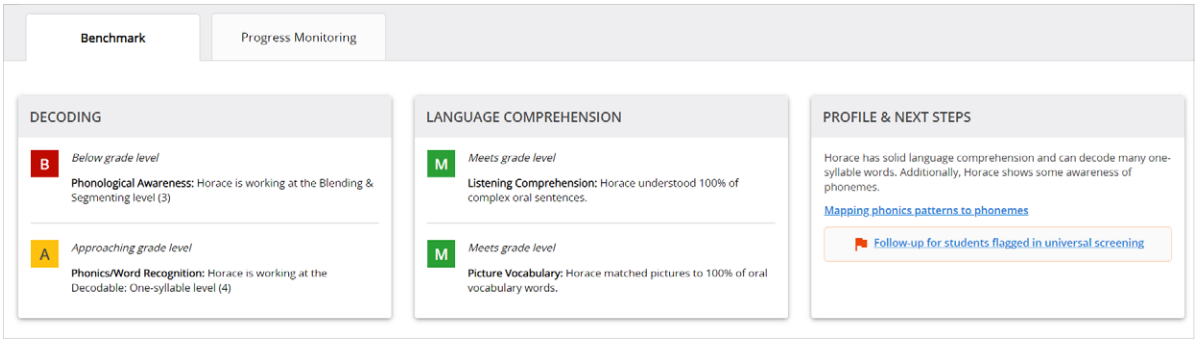
Screener Outcomes report

In the Screener Outcomes report, educators can view results of the universal screener tests and the dyslexia screener. The data highlights student flagging in foundational skills or oral reading by universal screener or dyslexia screener flagging so that educators can easily identify students in need of additional support and administrators can prioritize resource allocation. This report streamlines reporting by bringing key information from the benchmark/screening tests and user norms to one report, displaying domain scores and achievement status for the foundational skills domain areas and scaled reading rate for students' reading passages. This report is available in English only.

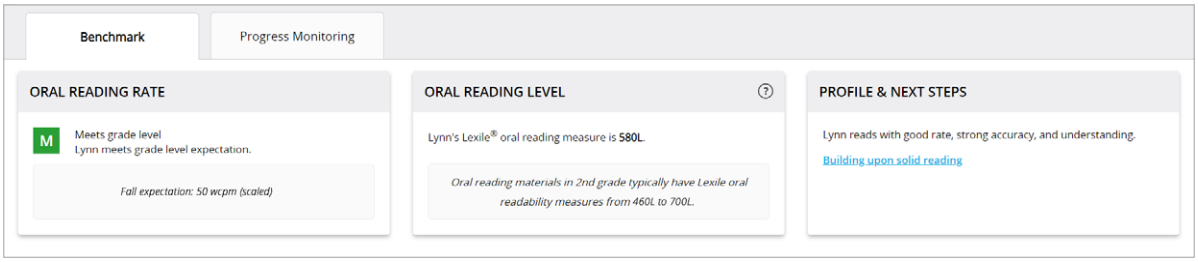


Individual Student report

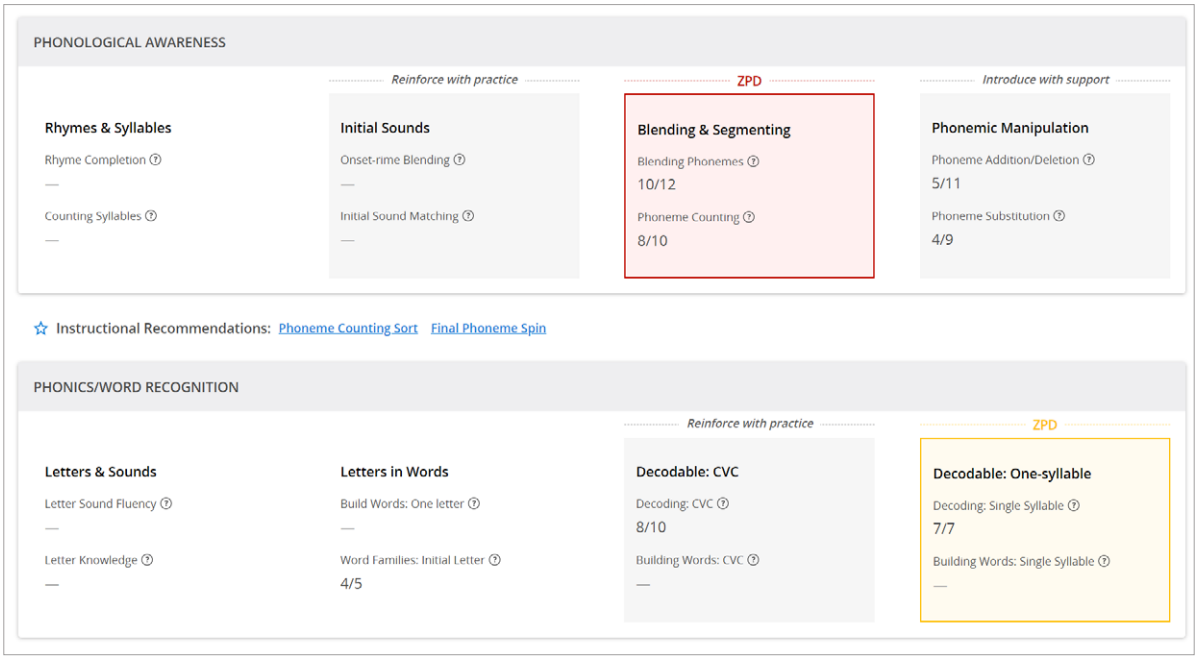
By clicking into a student's name from the Screener Outcomes report or Benchmark Matrix, educators can access the individual student report to see student's foundational skills data and/or oral reading fluency data. The **top portion** of the report provides a data summary based on grade-level expectations. The **Foundational Skills Summary** provides data for decoding and language comprehension, which are part of the Simple View of Reading. In addition, you have a succinct summary of students' performance and suggested next steps.



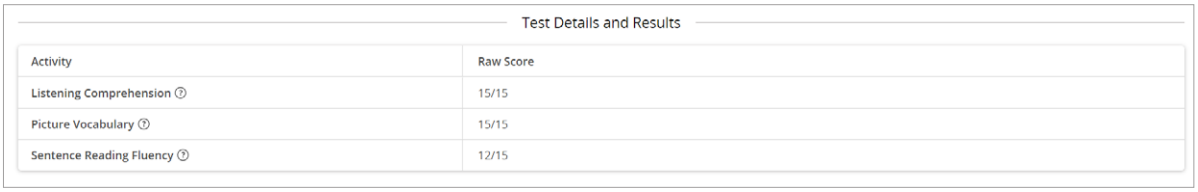
The **Oral Reading Fluency Summary** provides the student's scaled oral reading rate based on Hasbrouck and Tindal 2017 norms. The performance-level expectation is based on grade and seasonal expectations. Also, this is where an educator can find the Lexile® Oral Reading measure that suggests how much scaffolding a student may need to decode a text independently and successfully at grade level. Following, the educator can find a succinct summary of the student's performance and suggested next steps.



The **bottom portion** of the report provides detailed data for each domain assessed. In the **Foundational Skills Summary**, it highlights each student's Zone of Proximal Development (ZPD) to indicate what that student is ready to learn. The educator can find instructional recommendations with activities based on the student's data.

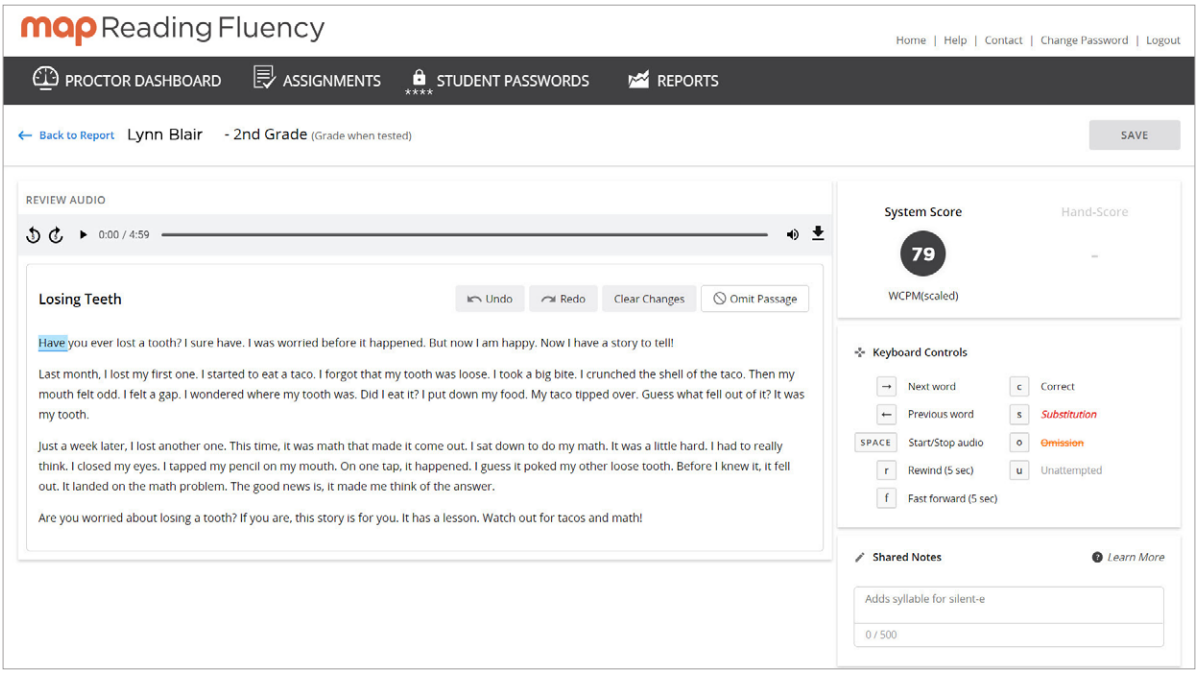


For students with oral reading data, the **Oral Reading Fluency Summary** highlights data based on the student's oral reading fluency performance. For each passage read, the educator can review the Lexile Text Measure, scaled rate, accuracy, and comprehension score.



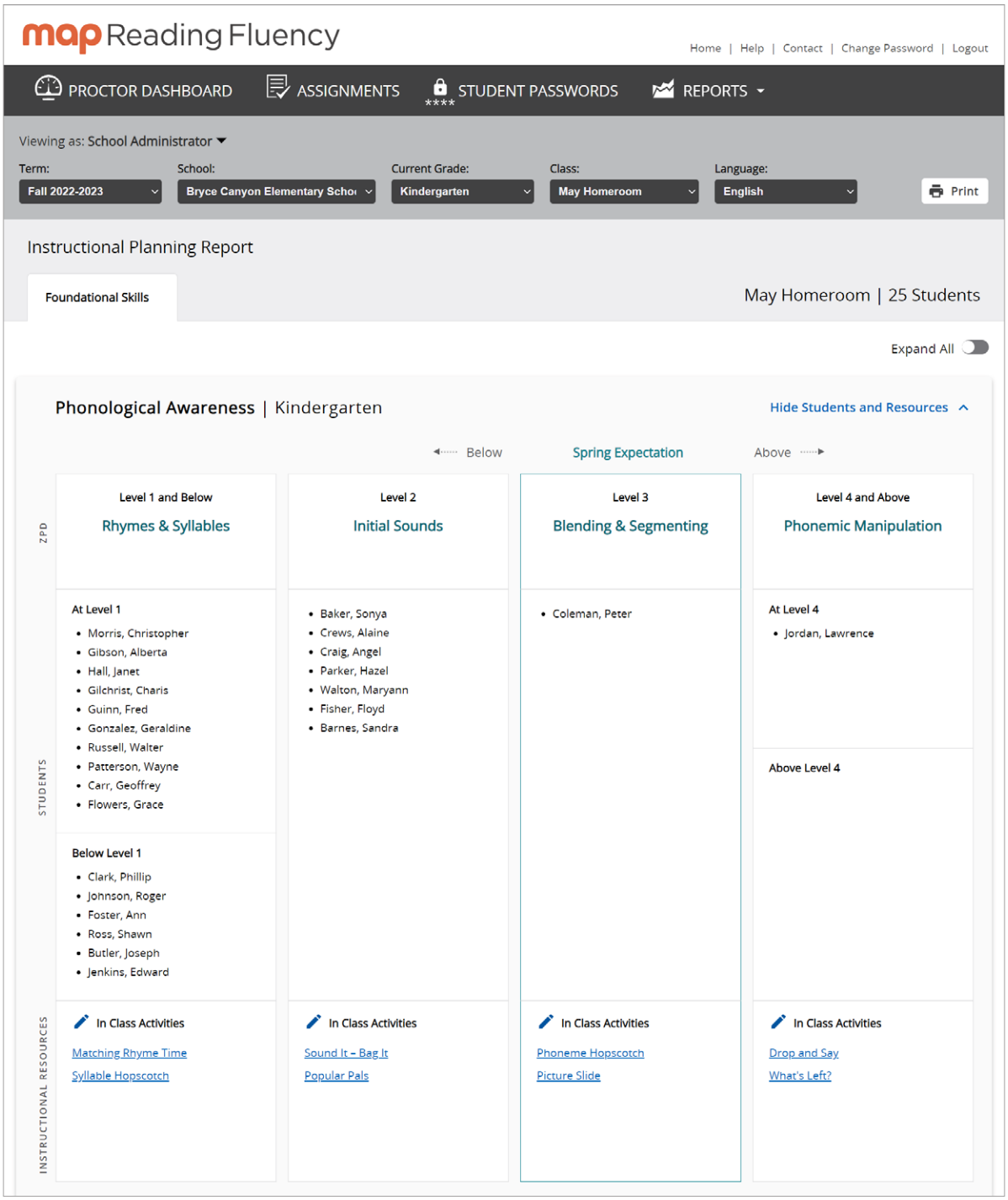
Audio archive

In addition, educators have access to audio archives of the students' reading so the educators can see the passage as well as hear how students read. It provides historical records that can be downloaded and shared with building teams, students, or families for a better understanding of how students are reading in terms of prosody and miscues as well as student progress.



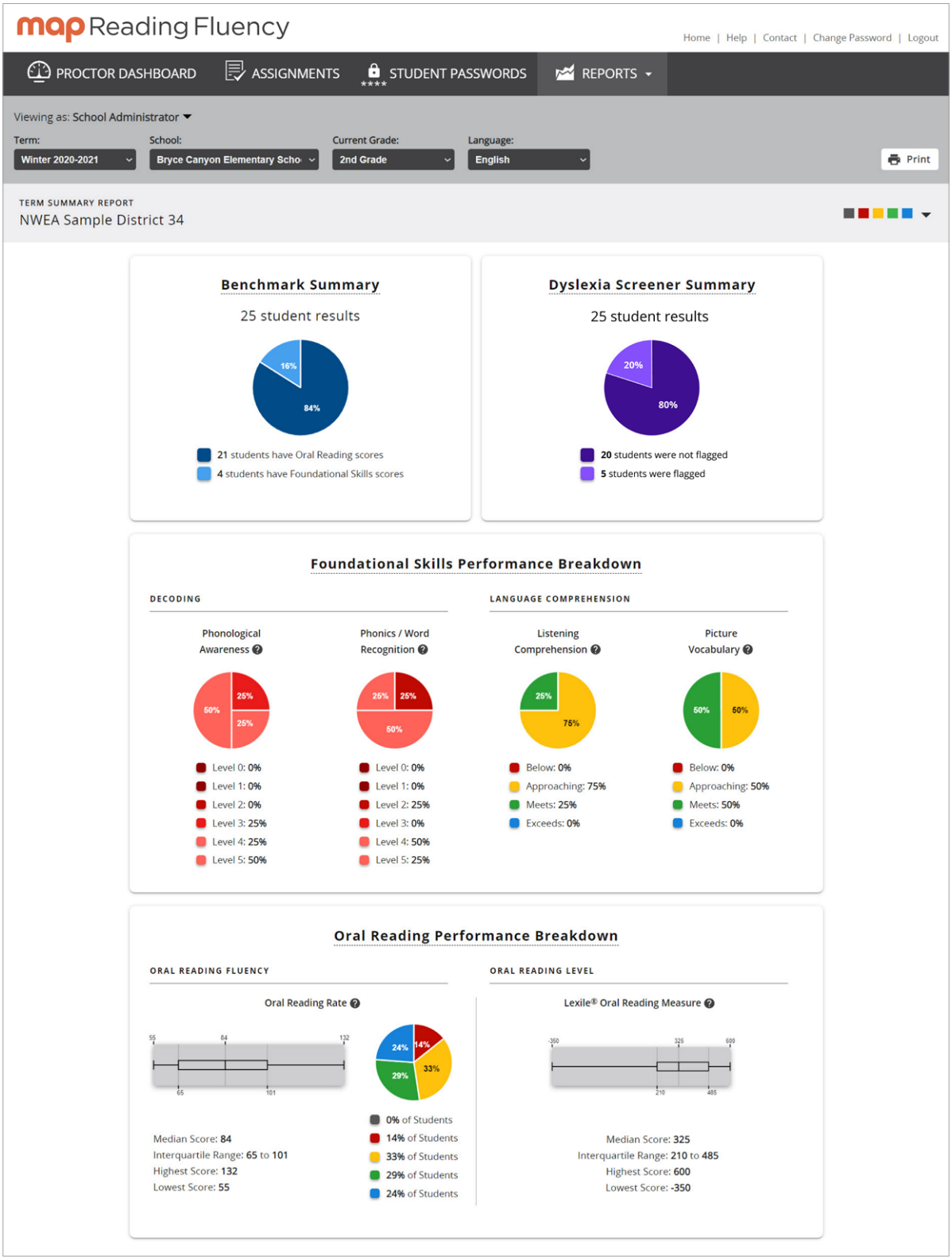
Instructional Planning report

This report shows Foundational Skills data for one class or one grade at a time. Students are grouped by their Zones of Proximal Development (ZPD) for phonological awareness, phonics/word recognition, and by their percentiles for the language comprehension domain (listening comprehension and picture vocabulary). Educators can also see students' current performance against the spring expectation by grade and skill. This data helps plan for differentiated instruction or interventions. Also, educators will find links to instructional recommendations that are aligned to the skills students are ready to develop. The activities are selected from research-to-practice organizations like the Florida Center for Reading Research and the Regional Center for Preventing Educational Risk.



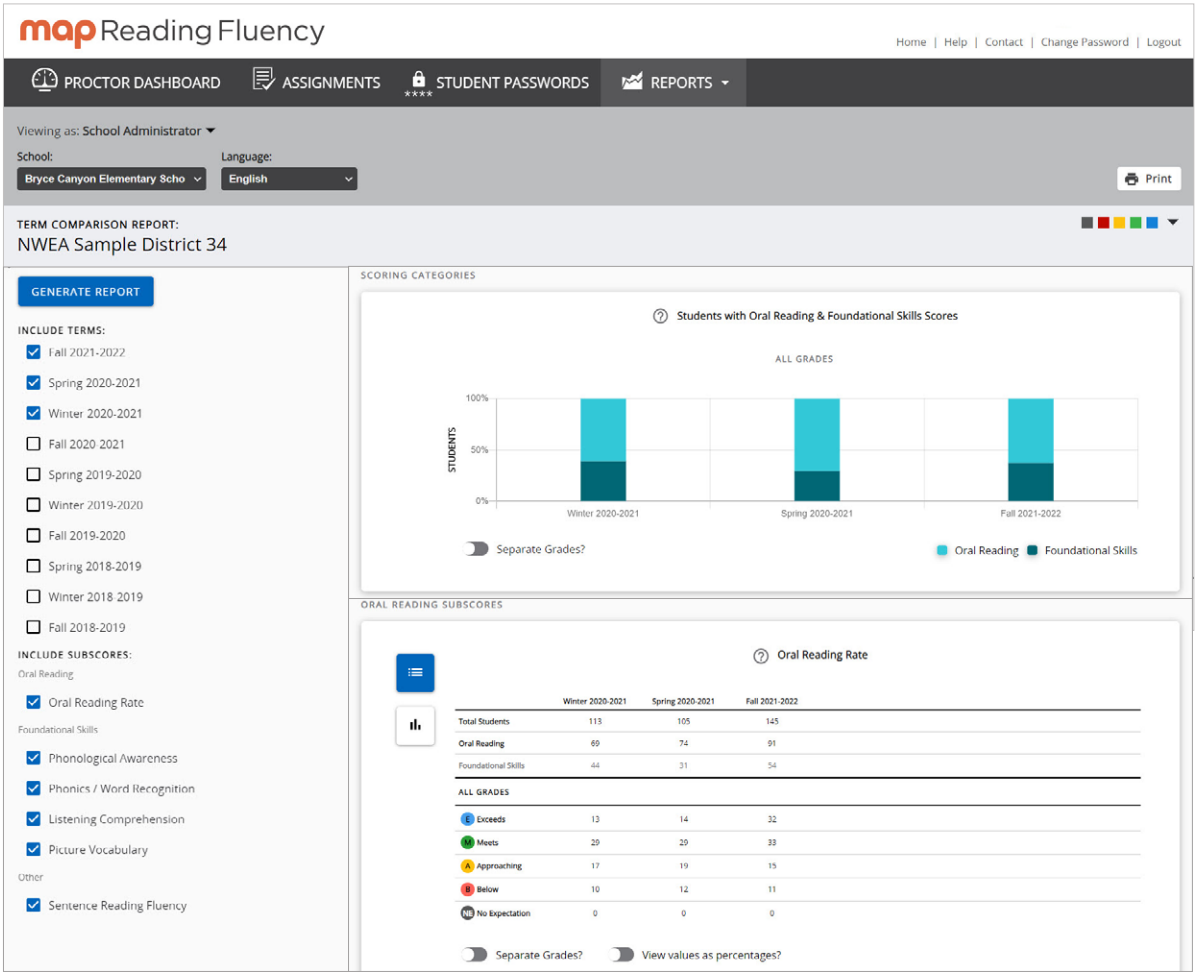
Term Summary report

The term summary provides district and building administrators with grade-level data for each term for students testing in either English or Spanish. Pie charts display how many students were assessed in foundational skills or oral reading, what percentage of students were flagged by the dyslexia screener, and what proportion of students are meeting benchmark expectations.



Term Comparison report

The Term Comparison report allows district administrators, building administrators, and educators to compare terms (fall, winter, or spring) from the same or different school years. The report provides a visual representation of performance-level outcomes (below, approaching, meeting, exceeding, or no expectations) for multiple terms to compare students' progress over time for a specific grade, several grades, or a cohort. The top of the report shows a breakdown of students with oral reading and foundational skills results in a bar chart. You can drill down further to compare sub scores in oral reading rate, phonological awareness, phonics/word recognition, listening comprehension, picture vocabulary, and sentence reading fluency for up to six terms.



Instructional strategies

Scaffolded practice

Scaffolding is the temporary assistance the teachers provide for the students in order to assist the students to complete a task or develop new understandings so that they will later be able to complete similar tasks alone (Hammond, 2001). Hammond notes several essential features of scaffolding:

- **Extending understanding:** Through teachers' quality of instruction, support, and guidance, they are able to clarify, challenge, and extend what students are able to do on their own. When students are challenged beyond their current abilities in a developmentally appropriate manner, it deepens and extends students' understanding of new concepts and skills. With low or high challenge but low support, little learning will occur. However, in environments with the right amount of challenge and high support, optimal learning can take place.
- **Temporary support:** Scaffolds, by nature, should be temporary in their usage. The main goal is for students to learn independently, so teacher support is gradually minimized as the learners become increasingly more skillful and, thus, independent.
- **Macro and micro focuses:** Scaffolding needs to be thought of in relation to the development of overall programs and curricula, as well as to selection and sequencing of tasks and to the specific classroom interactions that are part of those tasks.

Scaffolding is also known as the **gradual release of responsibility**, where teachers initially take on most of the responsibility for learning but gradually transfer it to the learners as they become more skilled.

A common form of scaffolded practice is the "I do, we do, you do" model, where the teacher first models how to complete a task (I do), then works on the task together with the students (we do), and finally allows the students to complete the task independently (you do) (Fisher & Frey, 2007; Fisher, 2003). The gradual release of responsibility model of instruction has been documented as an effective approach for improving literacy achievement (Fisher & Frey, 2007), reading comprehension (Lloyd, 2004), and literacy outcomes for English language learners (Kong & Pearson, 2003).

The practice of scaffolding is widespread in formal K–12 education systems and also in digital learning environments (Dalton & Rose, 2008). Research has demonstrated that embedding scaffolds such as vocabulary definitions, additional contextual information, main ideas of text, and reading strategy prompts supports comprehension of digital text (Anderson-Inman & Horney, 1998).

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency with Coach uses data obtained from its reading assessments to deliver scaffolded reading practice that is personalized based on each student's specific needs. MAP Reading Fluency with Coach's automated reading tutor delivers targeted instruction, practice, and feedback in all five key elements of early literacy: phonemic awareness, phonic, fluency, vocabulary, and comprehension. MAP Reading Fluency with Coach uses artificial intelligence technology to measure, define, and report each student's learning progression in order to ensure that advanced skills are not introduced prior to acquisition of prerequisite skills.

MAP Reading Fluency with Coach assesses skills each time a student uses the software and does not introduce new skills before a student has mastered the prerequisite skills. MAP Reading Fluency with Coach uses the learning progression to recommend reading resources aligned to each student's skills. MAP Reading Fluency with Coach has an extensive library of high-quality reading selections and also allows schools

and districts to upload their own reading selections. MAP Reading Fluency with Coach provides teachers with automatically generated score reports of each student's progress along with actionable insights for instruction and remediation.

Each scaffolded support within MAP Reading Fluency with Coach is a response to errors in the assessment phase and a means by which the AI avatar guides students through the reading material at hand and tutors them to build critical foundational skills. MAP Reading Fluency with Coach offers personalized instruction, corrects errors, and delivers feedback at three different moments within the reading session:

- Word level: When the student is stuck on a particular word
- Phrase level: When a student has struggled and misread words within a sentence
- Story level: As a wrap-up, MAP Reading Fluency with Coach helps students build comprehension and understanding at the end of the story

The scaffolded support and instructional techniques, referred to as **microinterventions**, employed by MAP Reading Fluency with Coach are based on evidence from reading science. Therefore, this inventory of microinterventions is organized by the critical elements of effective literacy instruction as outlined in Scarborough's Reading Rope.

Cumulative instruction

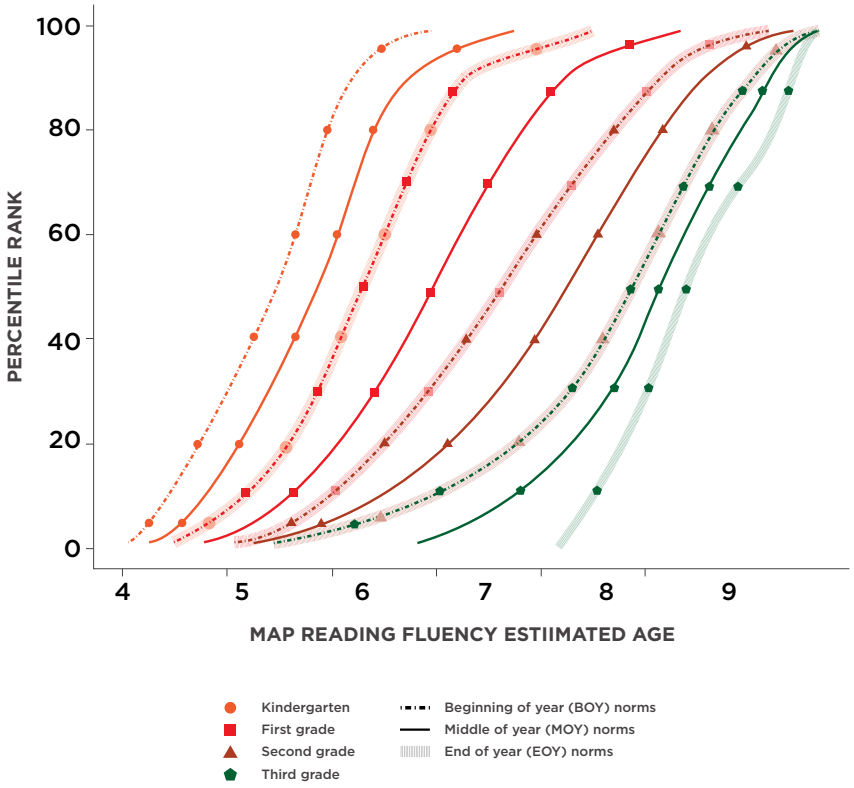
A cumulative approach to reading instruction is based on evidence from research studies conducted over decades and established on **learning progressions** theory. Learning progressions have been defined as empirically grounded and testable hypotheses about how students' understanding of core concepts within a subject domain grow and becomes more sophisticated over time (Corcoran et al., 2009). Skills follow a logical order of the language, and skills are organized with the easiest and most basic concepts first and then progress methodically to more difficult concepts and elements from grade to grade. **Cumulative** means each step must be based on concepts previously learned. Cognitive science research has shown that learning is cumulative. Complex cognitive skills can be broken into simpler skills, which can in turn be broken into even simpler skills, and lower-level skills must be mastered before higher-level skills can be mastered (Gagne & Briggs, 1974).

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency with Coach takes a systematic, explicit, and cumulative approach to reading instruction. Based on the Simple View of Reading, MAP Reading Fluency with Coach's multithreaded learning progression spans the essential elements of the reading rope including word recognition, fluency, and language comprehension. The essential design of MAP Reading Fluency with Coach's multithreaded learning progression is that skills are integrated by literacy thread or area. Instruction is systematic and cumulative in that within a thread, easier prerequisite skills are mastered before more difficult skills are introduced. MAP Reading Fluency with Coach's diagnostic score reports provide data about each student's mastery of the skills within a thread (**intra-thread linkage**). Within each thread, MAP Reading Fluency with Coach categorizes skills into a vertical stack based on the student's level of mastery. The vertical mastery stack serves to illustrate intra-thread linkage of literacy skills within a pillar and also to present the key skills as a spectrum and highlight the skills currently within a given student's Zone of Proximal Development (ZPD).

MASTERY LEVEL	LEVEL DESCRIPTION
Developed	The student has mastered the skill and achieved deep fluency
Likely mastered	The student is adept at the skill but lacks consistency and may need reinforcement
Appropriately challenged	The skill is developing

Percentile rank values for MAP Reading Fluency with Coach reading estimated age scores



Note: Because MAP Reading Fluency with Coach assessments are administered throughout the year (fall, winter, spring, and summer months), EOY norms for a given grade overlap with BOY norms for the next higher grade level (e.g., EOY kindergarten norms overlap with first-grade BOY norms).

MAP Reading Fluency with Coach also links skills and mastery horizontally across the threads (**inter-thread linkage**) to show how multiple threads are woven together to form the two components of the Simple View of Reading—word recognition and language comprehension (Gough & Tunmer, 1986; Scarborough, 2001).

STRAND	THREADS
Word recognition	Phonological awareness, decoding, sight recognition
Language comprehension	Background knowledge, vocabulary, structures, verbal reasoning, literacy knowledge

MAP Reading Fluency with Coach obtains frequent assessments of each student's mastery of key skills across the multiple threads that make up each strand of literacy and reports the data along with actionable insights to help the teacher plan targeted instruction.

Via the AI avatar, the program delivers targeted scaffolded instruction in component skills like decoding, segmentation, blending, and pronunciation. What makes MAP Reading Fluency with Coach unique is its ability to respond to each student's reading errors in the moment by providing explicit modeling and instruction that is tailored to the student's needs.

Early reader skills scaffold

When MAP Reading Fluency with Coach (or a teacher) categorizes students as early readers (or pre-readers), these students will be given a series of practice activities known as the Early Reader Skills Scaffold (ERSS). These activities are heavily scaffolded and research based to provide significant support in improving the students' early literacy learning and development.

Each activity builds on the previous activities, affording the student opportunities to practice and develop key skills for reading mastery. Each activity is relatively short, featuring 4–7 targeted items.

The sequence is designed to help students interact with the explicit letter/sound instruction productively. The activities start out at the easiest level and continue to build.

There is repetition of words and sounds across the activities, which help students feel successful and maintain enthusiasm while encouraging the work of decoding.

Interventions and scoring differ depending on the activities in the ERSS. Interventions in the ERSS for students can be:

- Repeating and modeling
- Full interventions (meaning an additional activity to support instruction)
- No intervention but encouragement from MAP Reading Fluency with Coach to try again

TASK	GOAL	SCORED AND INTERVENTIONS
Letter/sound introduction	Introduce letter and corresponding sound and provide explicit instructions on how to produce sound	Not scored
Letterflies	Sound identification: Practice the sound introduced	Correct/incorrect scoring; Repeating and modeling intervention
Up and down	Phonemic awareness: Initial sound isolation, blending 2–3 sounds	Correct/incorrect scoring; Repeating and modeling intervention
Elkonian box	Phonemic awareness: Initial sound isolation, blending 2–3 sounds	Correct/incorrect scoring; Repeating and modeling intervention
Change one part	Word analysis: Segmenting sounds	Correct/incorrect scoring; Full interventions
Word list	Practice reading words made up of 5 previous sounds introduced in activity block	Correct/incorrect scoring; ARM score; Full interventions
Easy decoding sentences	Practice	Correct/incorrect scoroing; ARM score; Full interventions

This sequence of activities was designed with Dr. Katie Pace Miles and student testing in kindergarten and grade 1 classes.

The sequence is designed to allow students to:

1. Start with explicit instruction and practice of a letter/sound correlation.
2. Easily practice by identifying and producing the sound in the Letterflies activity.
3. Practice segmenting and blending without letter identification. The Up and Down activity does not have letters but allows students to segment a CVC word with the target sound that was initially taught in the first section.
4. Decode CVC words with the target sound using the scaffolds of a supportive Elkonin activity.
5. Continue practice with the target sound and decoding by changing just one part of a CVC word containing the target sound.
6. Show their development and learning by reading CVC words containing the target sound. MAP Reading Fluency with Coach will scaffold and support with interventions if children are not able to read the words without an activity
7. Practice reading simple sentences with the target sound and words they've recently attempted to read.
8. Repeat parts of the sequence or specific skills if a child shows struggle with a new sound.

Word recognition

Phonological awareness

Effective reading instruction in the early grades focuses on helping students understand the role that phonemic awareness plays in learning to read and write. **Phonemic awareness** refers to the ability to identify and manipulate individual speech sounds in oral language (NICHD, 2000). A phoneme is the smallest unit of sound in a given language that can be recognized as being distinct from other sounds in the language. For example, the word "cap" has three phonemes (/k/, /a/, /p/), and the word "clasp" has five phonemes (/k/, /l/, /a/, /s/, /p/).

Phonemic awareness is essential to reading because hearing the individual component sounds in words is key to matching them with alphabet letters when learning to decode.

The importance of phonemic awareness in learning to read has been well documented. The National Reading Panel (2000) reviewed decades worth of reading research and concluded that phonemic awareness and letter knowledge are the two best indicators of how well children will learn to read during the first two years of instruction. Recent research also shows that phonemic awareness is an essential precursor to reading and that listening to and using language helps many, though not all, students gain this awareness prior to entering school (Brady et al., 2011).

Decoding

Effective reading instruction in the early grades focuses on helping students learn letter-sound correspondences. After learning to hear the sounds of speech, the next step for students is to learn **phonics**—the relationships between written letters (called **graphemes**) and the individual sounds they represent (**phonemes**). As these understandings fall into place, students begin to decode.

Initially, they may recognize familiar words on sight, but gradually they should apply what they know about letter-sound correspondences to decode words as they read and to encode words as they write (Foorman et al., 2016). Thus, in addition to learning letter-sound patterns, beginning readers must become fluent in decoding—the process of segmenting letter-sound patterns within words and blending them back together to access that word in their lexicon.

For some students, the transition from the understanding of how oral language functions to applying the same principles in understanding print requires patient, consistent teacher support. Once students know a few consonant and vowel sounds and their corresponding letters, they can start to sound out and blend them into words in isolation and in context. In this process, they must use their recognition of letter shapes, understand the order of letters in words, access the sounds of these letters, and put together the meanings of the words to create a basic understanding of the words on the page or screen (Adams, 1990; Cunningham & Allington, 2011).

The development of automatic word recognition depends on intact, proficient phoneme awareness, knowledge of sound-symbol correspondences, recognition of print patterns such as recurring letter sequences and syllable spellings, and recognition of meaningful parts of words (Moats, 2020).

Effective reading teachers also include instruction in **syllable structure**, which can help guide pronunciation of a written word, and **morphology** (knowledge of word parts like roots and affixes), which can also provide reliable information about pronunciation and meaning. Mastering advanced decoding skills like syllable structure and morphology can facilitate reading multisyllabic words. Effective reading instruction helps students master sound-symbol associations in two directions: visual to auditory (reading), and auditory to visual (spelling). Reading requires segmenting of whole words into the individual sounds, while **spelling**

involves the blending of sounds and letters into whole words. As such, learning to spell reinforces learning to read; spelling and reading are the productive and receptive sides of the same coin.

Strong teachers teach these skills explicitly with detailed explanations, modeling, and practice (Strickland, 2011). In these ways, teachers demonstrate the utility of the sophisticated concepts and skills students are working to master. Students should also be encouraged to try the skills out themselves by reading simple text or beginning to write on their own. This mixing of explicit instruction and practice activities strengthens students' understanding and gives them confidence as beginning literacy users. Students can also practice phonics skills by taking dictation from teachers; the resulting products give teachers valuable informal data about students' understanding of letter-sound correspondences and of letter formation.

Sight recognition

"High-frequency words" are those that are the most commonly used words in printed text. These words can be regular (decodable) or irregular in their spelling. The ability to fluently comprehend text—the goal of all reading instruction—depends on reading high-frequency words with automaticity (Adams, 1990). The importance of mastering high-frequency words is made clear by the fact that only 14 of the 150 most frequently used words in English follow sound-symbol generalizations that early readers are likely to have encountered (Adams, 1990). Indeed, some of the most common words in English, such as "does," "to," "were," "there," and "one," are irregular by any standard.

The 25 most common words in English represent about a third of all printed material, forming the glue that holds text together (Fry & Kress, 2006). Because of their frequency, students benefit from mastering high-frequency words before they can fluently read connected redundant text or decodable text. Adams (1990; 2001; 2009) advises that to avoid confusion in early learners, early instruction of irregularly spelled high-frequency words should be discrete from regular phonics instruction. Approaches that enable children to manipulate words through categorization, word association, or semantic analysis have been shown to be effective with both native speakers and English learners (Carlo et al., 2004; Marzano & Pickering, 2005; Nagy, 1997).

Fluency

Fluency refers to the ability to read letters, sounds, words, sentences, and passages, both orally and silently, with speed, accuracy, and the appropriate expression (NELP, 2008). Fluency is a reading skill that acts as a bridge between decoding and comprehension (NICHD, 2000).

A key component of fluency is **accuracy**, the ability to read or pronounce the words in a text correctly. Findings from research show that fluent reading depends on accurate and automatic word recognition, which in turn requires mastery of phonemic awareness and letter naming (Rasinski et al., 2006).

The **rate** or speed at which words are read is an essential component of reading fluency. The ability to accurately and quickly recognize letters, spelling patterns, and whole words with automaticity and effortlessness is essential to reading comprehension (Adams, 1990).

When students' word identification becomes fast and accurate, they have freed up some "cognitive space" to draw on their broader knowledge of language and to comprehend what they are reading (Baker et al., 2017; Hoover & Gough, 1990).

Researchers at the Language and Reading Research Consortium (LRRC) found that that word recognition fluency—a measure that includes both accuracy and rate—significantly predicted reading comprehension of students in grades 1–3 (LRRC, 2015). Additionally, the researchers found that the importance of rate increases as students' literacy skills develop; accuracy is a stronger predictor of reading comprehension for first- and second-graders, but for third-graders, measures of fluency that include rate predict reading scores better than accuracy scores alone (LRRC, 2015).

Prosody refers to the ability to read aloud with appropriate phrasing, intonation, and expression. Prosody also refers to the ways in which tone of voice and inflection convey meaning in oral language—for example, the way one expresses sarcasm or irony. Prosody is important because reading involves more than reading quickly and accurately—readers must also comprehend the meaning of text. Fluency is intricately linked to reading comprehension because strong readers demonstrate silent reading fluency as they recognize words and their meaning automatically and can attend primarily to making sense out of what they read (NICHD, 2000). Fluency—or lack thereof—may indicate to readers that they may have to go back to reread sections or to look up the meanings of some words.

According to Kuhn and colleagues (2006), prosody is separate from accuracy and rate in beginning readers: children cannot both read very quickly and with proper prosody at the same time. Research from cognitive psychology suggests that one of the functions of prosody is to help the reader retain an auditory sequence of sounds and words in working memory so that they can work to comprehend the meaning of text (Frazier et al., 2006; Swets et al., 2007). Taken together, these findings indicate the need to develop students' prosody in addition to accuracy and rate.

As teachers help students to become fluent readers, they need to reassure them that fluency means reading with comprehension, not merely saying the words as quickly as possible. Teachers model this distinction in their oral reading by pausing to question the meaning of words, the implications of word choice, or other aspects of the texts they are reading.

How MAP Reading Fluency with Coach aligns with the research

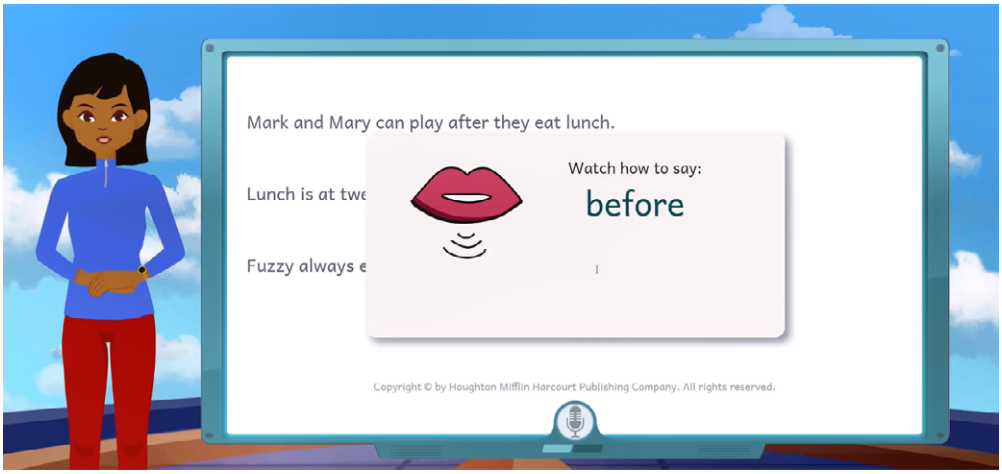
MAP Reading Fluency with Coach provides the following phonological awareness, decoding, sight recognition, and fluency supports that develop students' grapheme-phoneme correspondence skills, word attack skills, and recognition of high-frequency words.

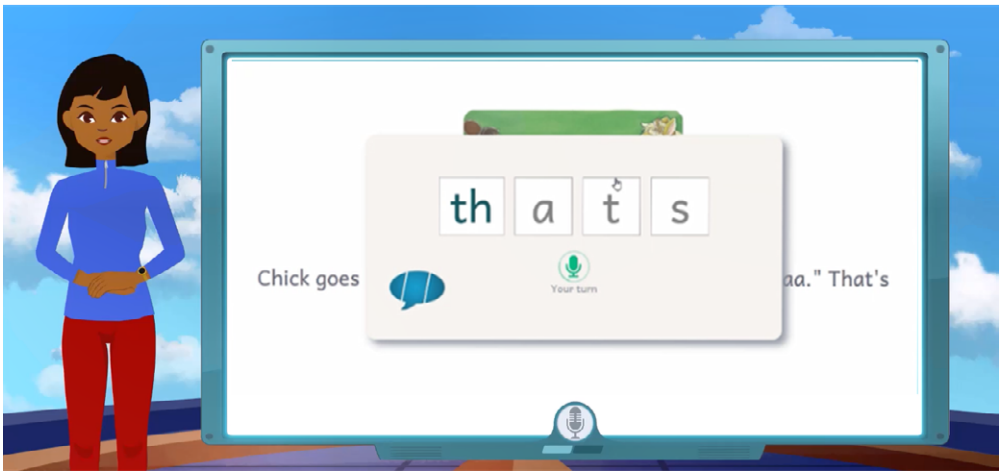
MICROINTERVENTION	DESCRIPTION	READING ROPE DOMAIN
Make a rhyme (1)	Maya, the AI avatar, says a word that rhymes with the target word. The student is then expected to say/read the target word.	Phonemic awareness
Make a rhyme (2)	Maya says a word that rhymes with the target word. The student is then expected to say/read the target word.	Phonemic awareness
Say one sound	Maya displays an image to contextualize the word. Then she asks the student to practice segmenting sounds without letters.	Phonemic awareness
Sound seeker	The student is presented with three image options and is asked to match the picture with a matching sound.	Phonemic awareness
Up and down	Students first practice segmenting the sounds of a word and then practice blending the sounds of the word.	Phonemic awareness
Elkonin sound box—Show picture	Maya asks students to move the red dots into boxes while they repeat the sounds making up a word. Students move the dots, say the sounds, and then blend the entire word. An image is displayed to support students. To promote segmenting and blending, the graphemes do not appear.	Phonemic awareness

MICROINTERVENTION	DESCRIPTION	READING ROPE DOMAIN
Elkonin sound box—Show graphemes	Maya asks students to move the red dots into boxes while they say the sounds making up a word. Students move the dots, say the sounds, and then blend the entire word. At the end, the graphemes are displayed.	Decoding, phonemic awareness
Elkonin sound box—Variable boxes	Maya asks students to move the red dots into boxes and use the graphemes and dots to practice combining graphemes into sounds. Students move the dots, say the sounds, and then blend the entire word.	Decoding, phonemic awareness
Elkonin sound box—Picture & graphemes	Maya asks students to move the red dots into boxes and use the graphemes and dots to practice combining graphemes into sounds. Students move the dots, say the sounds, and then blend the entire word.	Decoding, phonemic awareness
Give and take a sound	Student practices decoding a word by starting with part of the word.	Decoding/ Phonemic awareness
Letterflies	Floating letters are displayed, and Maya asks students to catch the sound she models/makes. A student practices letter sounds by catching the sound Maya makes.	Decoding, phonemic awareness
Word display	The intervention presents an image as a visual aid to contextualize the word, then she says the word and defines it. Then, she asks the student to identify a targeted sound (at the start of the word). Lastly, she displays the grapheme and says the sound, after the student has had a turn to practice.	Decoding, phonemic awareness
Word investigator	Maya selects the word that needs to be reviewed. She displays part of the word along with an image that illustrates the word, then asks students to choose the sound missing in the selected word. Letter options are presented for the student to select from.	Decoding, phonemic awareness
Syllabic sound out with definition	Maya helps a student by breaking a word into syllables and then asking the student to practice the parts and then blend the entire word.	Decoding, vocabulary
Articulation video	Maya first displays a picture of the selected word. Next, she shows a slowed articulation of the word. The word is read slowly for a student to practice reading it and encourage students to attempt a difficult word.	Decoding
Change one part	Maya asks the student to practice word attacking by manipulating part of a target word.	Decoding
Give the word	If a student appears to struggle with a word or if the student stops on a word, Maya will pause for a short period to give the student the opportunity to practice. If silence or struggling continues, Maya will read the word and ask them to keep going.	Decoding

MICROINTERVENTION	DESCRIPTION	READING ROPE DOMAIN
Graphemic sound out (1)	Maya helps a child break a word down into individual graphemes and sound out the word. Students are asked to listen to the sound and blend them into a word.	Decoding
Graphemic sound out (2)	Maya helps a child break a word down into individual graphemes and she models each sound in the word. Students are asked to listen to the sound and blend them into a word.	Decoding
Phonemic lip sync	Maya shows students a video of an adult accurately pronouncing the sounds of a word. Students are asked to then blend the parts of the word they've heard.	Decoding
Phonemic lip sync with sound out	Maya shows students a video of an adult accurately pronouncing the sounds of a word. Next, the graphemes are displayed, and lastly students are asked to then blend the parts of the word they've heard. Finally the full word appears.	Decoding
Phonics sound out	Maya isolates the word that needs to be practiced. She then breaks up the word by graphemes and lights up the parts of a word and says the sounds. The child repeats.	Decoding
Read to me	In this intervention, Maya reads a sentence or phrase to the student. The student is then asked to echo back the reading. The intervention typically lasts for 1 to 3 sentences.	Decoding
Rhyming game	Maya isolates the word that requires extra practice and says the word. Then she offers the student 3 options of words, the student is asked to select the word that rhymes with the target word.	Decoding
Sentence reread	Maya rereads a sentence where the student has struggled. The student then echo reads the sentence. The goal of this intervention is for a student to get help through a difficult sentence to regain fluency in reading.	Decoding
Sound out with graphemes	Maya says the word while displaying a pop-up spelling the word.	Decoding
Syllabic lip sync	Maya shows students a video of an adult accurately pronouncing the syllables of a word. Students are asked to then blend the parts of the word they've heard.	Decoding
Word lip sync with word and picture	Maya shows students a picture of the word. Next she shows a video of an adult accurately pronouncing the sounds of a word. Students are asked to then blend the parts of the word they've heard.	Decoding
Word scramble	Maya shows a child the target word, then scrambles the letters and asks the child to put them back in order.	Decoding

MICROINTERVENTION	DESCRIPTION	READING ROPE DOMAIN
Spell out	Maya uses the names of the letters to "spell out" the word quickly and then allows the student to repeat it as extra practice. This intervention is used on challenging words that the student would benefit from spending extra time on.	Decoding encoding
Flash card	In this intervention, Maya asks the student to read the target word 3 times as fast as possible. The word flashes on and off.	High-frequency words
Read the story	If a story is deemed far beyond a student's ability, Maya will read the entire story to the student. The student might be asked to echo read after each sentence.	Fluency
Sentence reread with error emphasized	Maya rereads a sentence where the student has struggled. As Maya reads, any errors the student made are emphasized or sounded out. The student then rereads the sentence.	Fluency, decoding
Too fast warning	Maya asks a child to slow down their reading as she detects many mistakes that are interfering with meaning making.	Fluency





Language comprehension

Vocabulary

From the very beginning, high-quality early literacy instruction must also include instruction and practice on vocabulary (Beck et al., 2013; Cunningham & Stanovich, 1997; Foorman et al., 2016). The extent of students' vocabularies varies widely when they enter school, often reflecting variety in home environments and prior experiences, such as differences between the language of home and of school or preschool attendance (Toub et al., 2018; Hart & Risley, 1995; Kieffer & Stahl, 2016). Teachers' everyday conversations with students can minimize these differences and expand students' oral vocabularies and concepts, in addition to their efforts to teach students academic language skills such as how to talk about books and about their own reading and writing (Foorman et al., 2016; Shanahan et al., 2010). Students' vocabularies expand from repeated encounters with new words, both in the literacy block and in content-area instruction (Connor & Morrison, 2012); vocabularies also grow from listening, reading, and talking to others.

Background knowledge

Content knowledge and reading are inextricably intertwined—reading will never progress beyond decoding without a foundation of content knowledge. The ability to comprehend a text depends greatly on the knowledge of the subject that the reader brings to that text. Researchers find that readers' levels of background knowledge and the ways in which they organize the knowledge in long-term memory predict their reading ability (Cabell & Hwang, 2020). A program that enriches the knowledge of students is crucial for reading improvement (Hirsch, 2014). Wide and deep knowledge of a range of meaningful topics is central to reading success and enables students to become effective members of their communities. When literacy instruction is structured to build knowledge systematically over time, students will be more likely to comprehend what they are reading and continually build on what they already know to become better readers and communicators. As students learn new concepts, they can use knowledge networks (sets or interconnected ideas) to build schema, connecting new ideas to existing ones, and to map ideas onto a web of knowledge to make sense of them and hold them in their memory (Bransford et al., 2000).

Literacy knowledge

Literacy knowledge is a specific form of background knowledge developed from experience with reading. Examples of reading-specific background knowledge include knowledge of common genres (e.g., fiction, nonfiction, poetry) and typographical features (e.g., titles, heading, italics, paragraph indenting, etc.) (Duke & Cartwright, 2021).

In a recent meta-analysis of 45 studies involving students in grades 2–12, Hebert et al., (2016) found that text structure instruction designed to improve literacy knowledge led to gains in students' expository reading comprehension. Other studies involving beginning readers have shown that basic understanding of print and graphics is related to reading ability (e.g., Lonigan et al., 2008).

Language structures

Language structures include the ways in which organization of language at the word and sentence levels conveys meaning (Duke & Cartwright, 2021).

At the word level, morphological awareness involves the smallest units of meaning in language (Duke & Cartwright, 2021). Studies have shown that the knowledge of and ability to analyze morphemes (e.g., suffixes, prefixes, roots, contractions) supports comprehension (e.g., Gottardo et al., 2018; Levesque et al., 2019; Zhang & Ke, 2020). Research also suggests that morphological awareness acts as a bridge connecting word recognition to language comprehension; other bridging processes include reading fluency, vocabulary knowledge, and letter-sound-meaning flexibility (Duke & Cartwright, 2021). To support the bridging role of

morphological awareness, studies have shown that instruction in morphological analysis not only improves comprehension but also contributes to gains in word recognition, spelling, and vocabulary knowledge (e.g., Ash & Baumann, 2017; Goodwin & Ahn, 2013).

At the sentence level, language structure includes knowledge of syntax (rules of grammar and sentence construction) and semantics (meaning of a sentence). In a longitudinal study involving third- and fourth-graders, Deacon and Kieffer (2018) found that syntactic awareness significantly and strongly predicted reading comprehension. In another study involving 139 students in third grade, Mimeau et al. (2018) found that students' semantic learning directly predicted their reading comprehension.

Verbal reasoning

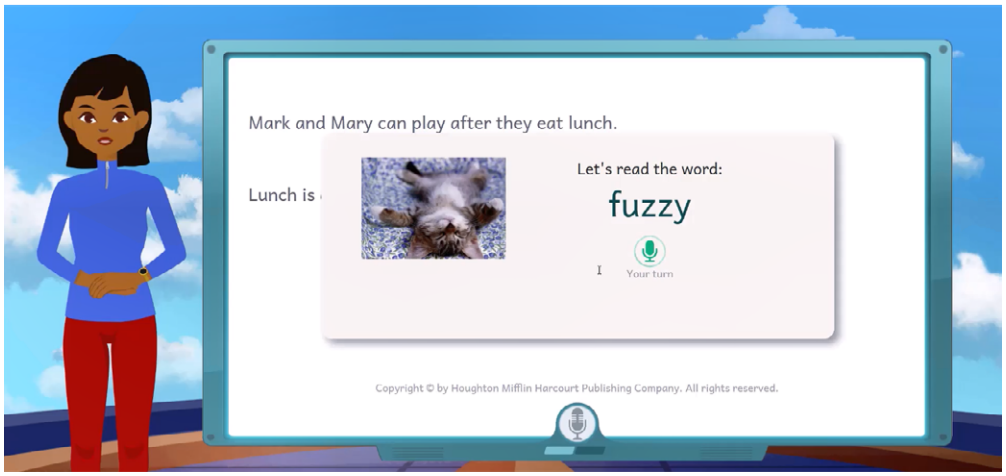
Verbal reasoning involves the ability to go beyond vocabulary and the printed text in order to make inferences and interpret metaphors and figurative language (Duke & Cartwright, 2021). In a recent meta-analysis of 25 studies involving K–12 students, Elleman (2017) found that instruction in inference improved comprehension among both skilled and less-skilled readers. In another study involving 62 students in the sixth grade, Daugaard et al. (2017) found that inference-making mediates the role of vocabulary knowledge on reading comprehension, even after controlling for verbal working memory. According to the researchers, a reason for this finding is that inference making requires the reader to focus on the semantic relationships among words, which in turn facilitates their comprehension.

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency with Coach embeds the vocabulary activities that support students in understanding the meaning, context, and usage of academic and content-specific vocabulary words; comprehension supports that help students understand the meaning of the text, develop broader content knowledge, and apply comprehension strategies to novel stories; and activities that develop students' understanding of language structures and morphological awareness. In addition, MAP Reading Fluency with Coach contains a wide array of text types that covers multiple genres. Students have exposure to both fictional and informational texts at various reading levels.

MICROINTERVENTION	DESCRIPTION	READING ROPE DOMAIN
Provide a definition (No Image)	Maya, the AI avatar, provides a student with the word and a verbal definition of the word. Students are expected to listen and then repeat the word.	Vocabulary, background knowledge
Provide a definition (With Image)	Maya provides a student with the word, a verbal definition of the word, and an image of the word. Students are expected to listen and then repeat the word.	Vocabulary, background knowledge
Homonyms	Maya selects a word that is a homonym. Then Maya asks the student to select the definition that best defines the word.	Vocabulary, background knowledge
Vocabulary quiz	During this intervention activity, Maya provides the definition for the selected word, Maya then asks students to select the image that best represents the selected word.	Vocabulary, background knowledge
Cognate	Maya helps the student to bridge from Spanish to English. Maya shows the student the Spanish cognate for the English word that has induced struggle.	Vocabulary, decoding
Fun fact	This intervention aims to provide background knowledge from a light-hearted point of view. The intervention typically shows the word and an amusing picture, and Maya relays a fun fact where the word is mentioned one or more times.	Background knowledge, vocabulary
Name knowledge	In this intervention, Maya sounds out a name, pronounces a name, and provides information about the meaning of the name. She also might ask the student to say, "Hello, _____" to practice the name and increase understanding of the word as a name.	Background knowledge, vocabulary
Name fun fact	Maya helps a student practice the name of a person by saying the name and offering a fun fact about the name.	Background knowledge, decoding, vocabulary
Mid-story comprehension question	Maya deploys a multiple-choice comprehension question to check for understanding during a story.	Comprehension, vocabulary

MICROINTERVENTION	DESCRIPTION	READING ROPE DOMAIN
Comprehension quiz	At the end of a story, Maya asks two to three questions to check a student's comprehension of the passage they read. These can be multiple-choice or cloze based.	Comprehension, vocabulary
Prediction question	This intervention fires after a student has read a portion of the passage. It asks the student to predict an outcome or pathway in the story they are reading. The goal is to engage students and to check their understanding of the text covered thus far in their reading session.	Comprehension
Solve a riddle	Maya poses a riddle. The answer is the target word.	Background knowledge, language structure
Endings practice	Maya points out a dropped or added ending. Maya asks the student to pay attention to word endings. The student is then asked to try reading the selected word.	Language structures, decoding
Morpheme roots interventions	Maya highlights a root. Then Maya explains what the root means. The student is asked to name another word that uses the root. Maya then provides a word.	Language structure, vocabulary, background knowledge
Prefix intervention	Maya highlights a prefix. Then Maya explains what the prefix means. The student is asked to name another word that uses the prefix. Maya then provides the word.	Language structure, vocabulary, background knowledge
Suffix intervention	Maya highlights a suffix. Then Maya explains what the suffix means. The student is asked to name another word that uses the suffix. Maya then provides a word.	Language structure, vocabulary
Morpheme root quiz	Maya highlights a root. Then Maya explains what the root means. The student sees other words containing the root. Then the student is asked to choose which of 3 words contains the root.	Language structure, vocabulary, background knowledge
Morpheme prefix quiz	Maya highlights a prefix. Then Maya explains what the prefix means. The student sees other words containing the prefix. Then the student is asked to choose which of 3 words contains the prefix.	Language structure, vocabulary, background knowledge
Morpheme suffix quiz	Maya highlights a suffix. Then Maya explains what the prefix means. The student sees other words containing the suffix. Then the student is asked to choose which of 3 words contains the suffix.	Language structure, vocabulary, background knowledge



MAP Reading Fluency with coach employs AI technology to conduct dynamic, personalized comprehension conversations with students during or after reading a passage aligned to the Science of Reading. First, Maya identifies the skill that needs additional practice, then the student responds to Maya's inquiry. Once the student responds, Maya determines whether the student understands the concept. Maya further probes the student with additional questions when needed.

"Can you describe a time when you were in the 'home stretch' of an activity?

Maya identifies the skill

"I am learning swimming. I am almost done with all the basic strokes, but still have to learn diving."

Maya determines the degree to which the student's answer is on point

"Great example! Learning new skills like swimming can certainly feel like you're in the 'home stretch' of an activity. Can you think of another situation where you felt like you were nearing the end of a task or project?

Maya probes in the context of a student's response

Differentiated instruction

Motivating all learners

Educators and researchers often distinguish between two types of motivation: **intrinsic** and **extrinsic**. Intrinsically motivated learners are those who are driven by a love for learning and desire for self-satisfaction, while extrinsically motivated learners are driven by a quest for external rewards like praise, high scores, good grades, and money (Corpus et al., 2009). Research has shown that both forms of motivation are related to learning, with intrinsic motivation having stronger effects on learning and achievement. A longitudinal study of middle school students found that fifth graders' intrinsic motivation, perceived competence, and engagement with school were significant predictors of their reading achievement in eighth grade (Froiland & Oros, 2014). Research on motivation and mindset demonstrates that how teachers deliver praise has an effect on students' beliefs about their own intelligence (Dweck, 2007). Students who are praised for their effort and grit rather than their talent or ability are more likely to develop malleable growth mindsets, resilience to setbacks, and increased motivation to learn (Dweck, 2007).

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency with Coach was designed to be a patient and non-threatening program that provides support as needed. Within the comfort zone that the software provides, students are motivated by effective praise, targeted feedback, entertaining and high-interest content, algorithms that recommend content based on student interests, having agency in choosing what to read (at an appropriate level), and the desire to complete a story.

MAP Reading Fluency with Coach is designed to build motivation, foster a sense of agency, and encourage grit and stamina in young readers. The software is centered on the reading cycle—selection, practice, skill building, reward, and progress monitoring. MAP Reading Fluency with Coach is aligned with the considerable research that shows that providing students with choice is effective in increasing motivation. On entry, each student is presented with a set of appropriately leveled reading resources selected by MAP Reading Fluency with Coach's AI technology to build the skills within the student's ZPD and allowed to choose which text to work with.

As students read with MAP Reading Fluency with Coach, they receive instantaneous feedback. This breakthrough aspect of the MAP Reading Fluency with Coach software prevents lack of immediacy from sapping motivation and interest. In addition to immediate formative feedback, MAP Reading Fluency with Coach also provides summative reports of student progress upon completion. MAP Reading Fluency with Coach's progress reports allow students to view their latest performance scores and also their progress over time.

Additionally, MAP Reading Fluency with Coach is aligned to research on effective use of praise and follows evidence-based best practices in praising students for effort, determination, and persistence rather than success or achievement. MAP Reading Fluency with Coach is designed to deliver praise whenever students show that they are trying to exercise and extend their skills.

Teaching exceptional learners

Students with disabilities

Early and frequent screening of students in kindergarten to grade 3 provides the first means of identifying students with disabilities and students with dyslexia (Gersten et al., 2008). Results from screening tests may suggest that more focused diagnostic testing is advisable to pinpoint the causes of students' potential struggles. Data from such testing that indicates students are at risk for reading failure should set into motion development of a Response to Intervention (RTI) plan and, if needed, further evaluation and the development

of an individualized education program (IEP). To maximize success for these students, classroom teachers and specialists need to work together to ensure that the plan is followed and the interventions are successful. Students' RTI plans and IEPs most likely provide guidance for the Tier 1 instruction.

Literacy scaffolding is vital for students with disabilities, and computer-based literacy instruction offers many ways to provide necessary supports for students with disabilities. Research has shown that assistive technology software providing text-to-speech features along with built-in supports improves access to learning and also leads to large performance gains for students with visual impairments and learning disabilities (Elkind & Elkind, 2007; Izzo et al., 2009). Researchers have discovered that compared to traditional static text, supported electronic text with interactive multimedia links and resources has been helpful to readers who struggle to acquire word meanings (Anderson-Inman & Reinking, 2013; Anderson-Inman, 2009).

Students with dyslexia

Dyslexia is a specific learning disability that is neurobiological in origin that is characterized by an "unexpected difficulty in reading for an individual who has the intelligence to be a much better reader, most commonly caused by a difficulty in the phonological process, which affects the ability of an individual to speak, read, and spell" (Shaywitz & Shaywitz, 2020, p. 100). Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge (International Dyslexia Association, 2002).

Early identification, remediation, and providing accommodations such as assistive technology where necessary are critical for minimizing these secondary consequences and others such as the detrimental effects of experiencing repeated failure. Developing a dislike for reading can make problems worse if students avoid reading and thereby fall further behind.

Over the past couple of decades, the development of methods of detection and interventions for dyslexia have increased, and many have incorporated the use of technology. Conventional dyslexia detection processes are now augmented with computational intelligence techniques (Jain et al., 2009; Gaggi et al., 2012; Perera et al., 2016).

Research indicates that students with dyslexia perform worse in reading irregular and nonsense words compared to regular words, suggesting that impairments in decoding are characteristic of dyslexia (Ziegler et al., 2008). Recent research has highlighted the importance of rapid naming skills in fluent reading. The ability to quickly and automatically process, identify, and name familiar text and objects is related to reading (Georgiou et al., 2013), and this skill is impaired in students with dyslexia (Jones et al., 2010).

Moreover, students who struggle with reading may lack the "reading stamina" needed during a literacy block that requires independent work in addition to working with teachers and students. Students with reading difficulties need extra practice, extra time, and books aligned with their proficiency that engage their interests.

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency with Coach provides both the dyslexia screener for early detection and identification of students who are at risk for reading difficulties and subsequent personalized practice that meets each student's unique needs.

MAP Reading Fluency with Coach integrates assistive technology supports that allow learners with visual and auditory disabilities to access text. MAP Reading Fluency with Coach uses the power of automated speech recognition and artificial intelligence to listen to students read aloud and analyze their phonological awareness, alphabetic awareness, word reading, and rapid automatized naming skills, allowing frequent and

early screening for dyslexia. Because MAP Reading Fluency with Coach is designed to adapt and personalize practice, the software quickly identifies striving readers and optimizes interactions for these students.

- **Continuous releveling:** As a student works with MAP Reading Fluency with Coach, a real-time frustration index is maintained, based on WCPM and accuracy metrics. When a passage is proving too difficult, MAP Reading Fluency with Coach will suggest an alternative text, where a more appropriate level of productive struggle will occur. By constantly adapting the reading resources being utilized to the current, ever-evolving skill level of a student (while still enabling students to choose their own stories at their level), MAP Reading Fluency with Coach helps striving students build grit and engagement, while working within their ZPD.
- **Reinforcement triggered by error:** MAP Reading Fluency with Coach's mastery model ensures a focus on the skills that are likely developing now. But, unlike other software, MAP Reading Fluency with Coach is constantly listening to students read. As a student makes errors, MAP Reading Fluency with Coach can use these concrete, observed miscues to reinforce the appropriate skills. This constant but targeted scaffolding is especially constructive for striving readers.
- **Foundational interventions:** While many students benefit from lightweight interventions, MAP Reading Fluency with Coach includes many tutoring techniques that are especially appropriate for readers with severe difficulties. The research shows that the antidote for many language and reading disorders (such as dyslexia) is structured and repetitive work on word recognition. MAP Reading Fluency with Coach provides scaffolded support in decoding skills and building phonemic awareness.

Multilingual learners

The best practices included in the report "Teaching Academic Content and Literacy to English Learners in Elementary and Middle School" published by the Institute of Education Sciences outlines 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).

Multilingual learners may have difficulty mapping standard English phonology, conventions, and syntax due to differences between English and their primary language.

The research on effective instruction for multilingual learners points to three important principles: 1) generally effective practices are likely to be effective with multilingual learners; 2) multilingual learners require additional instructional supports; and 3) the home language can be used to promote academic development. Additionally, multilingual learners need plenty of opportunities to develop proficiency in English (Goldenberg, 2013).

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

How MAP Reading Fluency with Coach aligns with the research

While a student reads, MAP Reading Fluency with Coach recognizes the subtleties of various dialects, speech deficits, and accents to deliver results free of bias. The effectiveness of MAP Reading Fluency with Coach for multilingual learners has been illustrated in experimental studies by Project LISTEN researchers and by independent researchers at the University of British Columbia and DePaul University. Results from the studies have demonstrated that multilingual learners who used MAP Reading Fluency with Coach made significant gains in reading scores and outgained students in the control conditions (e.g., Poulsen et al., 2007; Reeder et al., 2007; Reeder et al., 2008; Reeder et al., 2015).

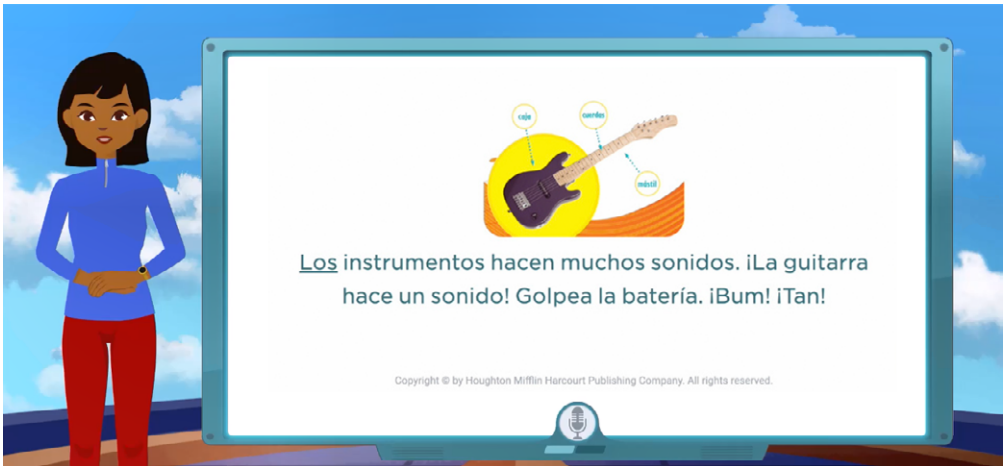
MAP Reading Fluency with Coach's success with multilingual learners is grounded in a set of accommodations and adjustments specifically aimed at the special needs and challenges of these students.

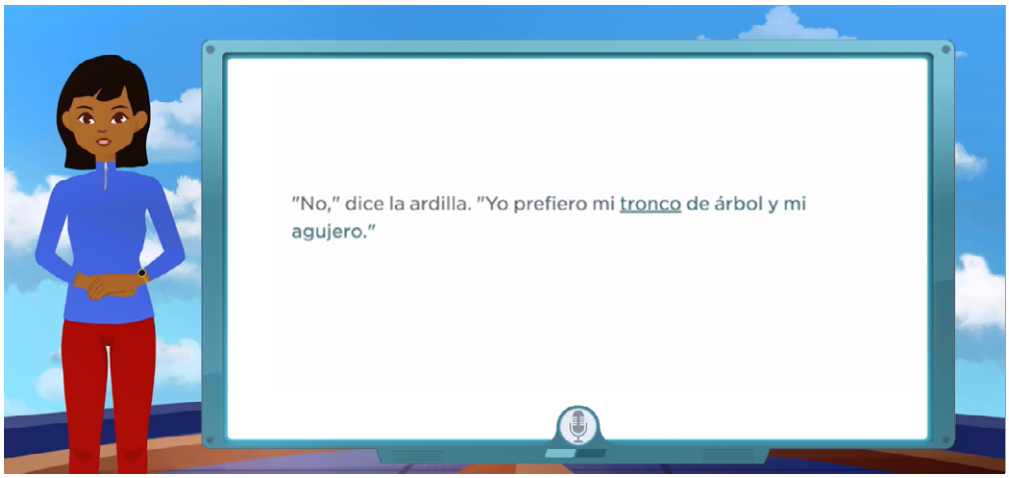
Spanish supports in MAP Reading Fluency with Coach

To assist students coming from homes where Spanish is primarily spoken, MAP Reading Fluency with Coach in Spanish delivers instruction in Spanish to provide first language support. When a student has been designated bilingual, MAP Reading Fluency with Coach will present a choice when they log in.

The student can opt to read a story in English or in Spanish.

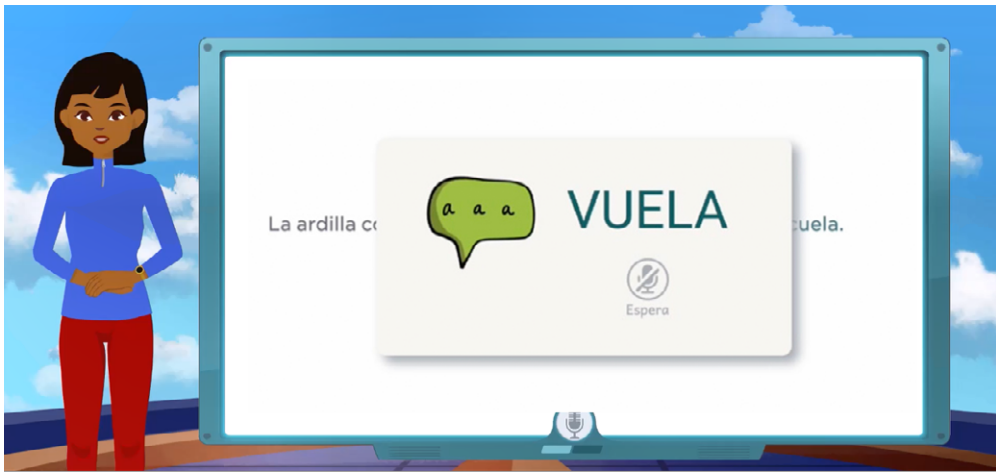
This choice is presented each time a student reads with MAP Reading Fluency with Coach. The student is free to go back and forth between Spanish and English as often as desired.

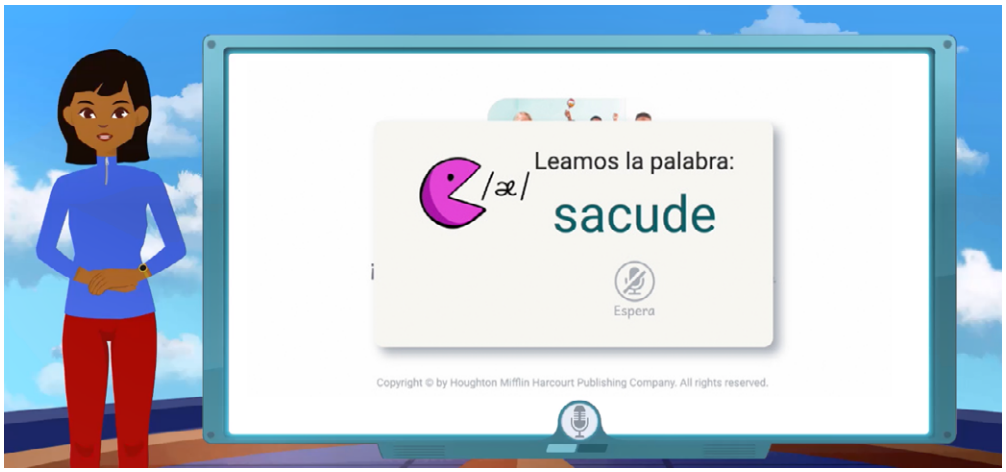




Whether a student works with MAP Reading Fluency with Coach in English or Spanish, the software delivers a range of Science of Reading based microinterventions specialized to help multilingual learners. All of the major microinterventions used by MAP Reading Fluency with Coach to build English reading mastery are used in Spanish, including sound boxes, lip syncing videos, sound outs, fun facts, rhymes, and definitions.

Students can be placed into the Early Reader Scaffold for Spanish via the Configure Practice button within the Tracking report.





MAP Reading Fluency with Coach is “trained” to understand different accents and dialects of various speakers by actually working with the students. MAP Reading Fluency with Coach has worked with thousands of Spanish-speaking students with diverse accents and a broad range of origins to deliver effective support that provides an equitable learning experience for multilingual learners.

Blended professional learning and services

Connected professional & personalized learning

Effective curriculum-based professional learning consists of ongoing, active experiences that focus on improving the rigor and impact of instructional practices and ideally replicate the learner-centered approaches that teachers are expected to provide for their students. Elements of effective curriculum-based professional learning include high-quality educative curriculum materials, transformative learning experiences that shift teachers' attitudes, beliefs, and practices, and a prioritization of equity to ensure all students meet high expectations. Functional design elements include learning designs that model inquiry-based instruction, experiences to shift teachers' beliefs, opportunities for reflection and feedback, and change management strategies that address individual concerns and group challenges. Finally, structural design features include collective participation in which teachers practice and reflect on the curriculum, models of learning that evolve from initial use to ongoing support to building capacity, and a considered use of time. These elements of effective curriculum-based professional learning must exist in a system with strong leadership, adequate resources, and coherence toward common goals (Short & Hirsh, 2020).

How professional learning is delivered has an impact on its effectiveness. Professional learning programs with teacher-to-teacher collaboration focused on instructional improvement—whether in professional learning communities (PLCs), teacher teams, or group work in professional learning sessions—have demonstrated improvement in teachers' instructional skills. Another effective practice is conducting follow-up meetings or coaching sessions after the initial implementation of a program so that teachers can share their experiences and receive feedback. The content of the professional learning is equally important. It should focus on subject-specific instructional practices (not merely content knowledge), prioritize specific supportive materials over general principles, and help teachers build stronger relationships with students (Hill & Papay, 2022).

Long-term connected professional learning includes cohesive features—online coaching, observations, and collaboration—all with a focus on how to ensure social and emotional well-being and meaningful student learning in digital environments. A connection between workshops, coaching, and collaboration is essential for a professional learning program to make a difference in student achievement. Connecting workshops, follow-up coaching, and support among peers can help teachers retain new knowledge, practice new skills, and share effective approaches that they can scale (Aguilar, 2019).

Effective professional learning, whether in-person, online, or blended, offers teachers coherent experiences so that their learning is connected to their work in the classroom and builds proficiency. This approach includes alignment between the study of theory and practice, observation of theory and practice, individual coaching, and further practice and refinement through collaboration. Each of these components is essential to support and build on the content and pedagogy that is learned, observed, and practiced in each of the other components (Rock, 2019).

For schools to support the implementation of high-quality instructional materials, effective professional learning during the launch of the curriculum, when teachers are learning and committing to an instructional approach, is critical (Gulamhussein, 2013). Teachers' initial exposure to a concept should engage them through varied approaches and active learning strategies to make sense of the new practice (Bill & Melinda Gates Foundation, 2014; Garet et al., 2001; Gulamhussein, 2013). An effective professional learning program should be curriculum-based and focused on targeted content, strategies, and practices (Bill & Melinda Gates

Foundation; 2014; Saxe et al., 2001; Wei, 2009) and be grounded in the teacher's grade level or discipline (Gulamhussein, 2013).

Online professional learning can help solve resource challenges in implementing a scalable and sustainable model. Online professional learning platforms can create a peer-to-peer support community, building the capacity of the teaching team to support each other. Perhaps most importantly, online professional learning allows teachers to experience the agency and personalized learning they are creating for students. The unique opportunity of blended professional learning is the shift from professional learning as a one-time or periodic event to professional learning as an ongoing and embedded practice (Tucker & Wycoff, 2019).

Many school districts and providers of teachers' professional development are moving toward a more personalized model of professional development, taking a cue from the movement toward personalized learning for students. This approach often focuses on short modules, which teachers can choose and then complete on their own time. The modules can incorporate aspects of gamification, micro-credentialing, and online professional development communities. By allowing teachers to choose their own professional development courses and activities and complete them in their own place at their own pace, the professional development will be better matched to their needs. Teachers will be able to set goals, find resources to help them meet those goals, track their progress, and get feedback from supervisors and colleagues (Gamrat et al., 2014; Meeuwse & Mason, 2018).

Providing teachers with time and frameworks to collaborate on improving their instruction, through professional learning communities (PLCs) or teacher study groups (TSGs), has the potential to improve teachers' knowledge, instructional practices, and student achievement. A study of TSGs focused on reading comprehension and vocabulary instruction found that teachers who participated in TSGs saw significant improvements in their knowledge of vocabulary instruction and their teaching practices. Students of the TSG teachers also saw improvements in oral vocabulary (Gersten et. al., 2010).

How MAP Reading Fluency with Coach aligns with the research

MAP Reading Fluency with Coach supports teachers by delivering quality assessments, insightful reports, and a tutoring solution to improve student reading growth. NWEA provides a continuum of professional learning to not only support a successful MAP Reading Fluency with Coach implementation but also help teachers to use the data to strengthen teaching and learning. Through live virtual, onsite, and on-demand professional learning opportunities, NWEA partners with districts and schools to engage teachers and leaders in professional learning that fosters high-quality instruction to improve student outcomes.

Explore the power of MAP Reading Fluency with Coach through NWEA professional learning workshops

Introduction to MAP Reading Fluency with Coach

Engage in this one-hour virtual workshop specifically designed for current NWEA partners who have been using MAP Reading Fluency. This workshop highlights what makes MAP Reading Fluency with Coach a unique and integrated solution and answers the question of "What's next?" after taking MAP Reading Fluency assessments. Participants will leave the workshop understanding the key features of MAP Reading Fluency with Coach and how to utilize it to support student learning.

- Use MAP Reading Fluency with Coach to provide students with targeted, one-on-one reading practice.
- Track progress and measure growth with MAP Reading Fluency with Coach reports.
- Make instructional decisions and support student learning using data provided by MAP Reading Fluency with Coach.

MAP Reading Fluency: Essential reports with Coach for teachers (Two hours)

Engage in this two-hour virtual workshop specifically designed for new or current NWEA partners to learn how to navigate key reports in MAP Reading Fluency. This workshop highlights what makes MAP Reading Fluency with Coach a unique and integrated solution and answers the question of "What's next?" after taking MAP Reading Fluency assessments. Participants will leave the workshop understanding the key features of MAP Reading Fluency with Coach and how to utilize it to support student learning.

- Interpret and apply MAP Reading Fluency data.
- Use MAP Reading Fluency with Coach to provide students with targeted, one-on-one reading practice.
- Track progress and measure growth with MAP Reading Fluency with Coach reports.
- Make instructional decisions and support student learning using data provided by MAP Reading Fluency with Coach.

MAP Reading Fluency: Essential reports with Coach for teachers (Three hours)

Engage in this three-hour virtual or onsite workshop specifically designed for new or current NWEA partners to learn how to navigate key reports in MAP Reading Fluency. This workshop highlights what makes MAP Reading Fluency with Coach a unique and integrated solution and answers the question of "What's next?" after taking MAP Reading Fluency assessments. Analyze data and develop instructional plans focused on growth opportunities for learners. Participants will leave the workshop understanding the key features of MAP Reading Fluency with Coach and how to utilize it to support student learning.

- Interpret and apply MAP Reading Fluency data.
- Explore student-centered decisions that are informed by MAP Reading Fluency data.
- Use MAP Reading Fluency with Coach to provide students with targeted, one-on-one reading practice.
- Track progress and measure growth with MAP Reading Fluency with Coach reports.
- Make instructional decisions and support student learning using data provided by MAP Reading Fluency with Coach.

Deepen understanding using MAP Reading Fluency foundations online

MAP Reading Fluency foundations online learning

MAP Reading Fluency Foundations online learning provides just-in-time, self-paced tools and knowledge that staff across your school or district need to deliver MAP Reading Fluency assessments, analyze reports, and take action to help students learn. This essential learning tool has role-based lessons, pragmatic advice from real educators, and actionable templates to help staff get started and then continue the journey throughout the school year to provide self-paced, digestible learning segments to make it easy for educators to learn exactly what they need, right when they need it. MAP Reading Fluency foundations has a course dedicated to MAP Reading Fluency with Coach. Teachers and leaders can engage with the learning when they are ready to uncover what makes MAP Reading Fluency with Coach a unique and integrated solution that answers the question of "What's next?" after taking MAP Reading Fluency assessments. Participants will leave the course understanding the key features of MAP Reading Fluency with Coach and how to utilize it to support student learning.

- Use MAP Reading Fluency with Coach to provide students with targeted, one-on-one reading practice.
- Track progress and measure growth with MAP Reading Fluency with Coach reports.
- Make instructional decisions and support student learning using data provided by MAP Reading Fluency with Coach.

Conclusion

Drawing on decades of research in computer science, cognitive psychology, artificial intelligence while incorporating the science of reading, MAP Reading Fluency with Coach delivers targeted instruction, practice, assessment, and feedback in phonemic awareness, phonic, fluency, vocabulary, and comprehension. This unique approach is highly effective with students of varying ability levels and allows students to gain and retain critical literacy skills essential for lifelong learning.

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