SCIENCE OF LEARNING: READING

RESEARCH PROFESSIONAL PAPER

THE SCIENCE
OF EARLY LITERACY
IMPLEMENTATION

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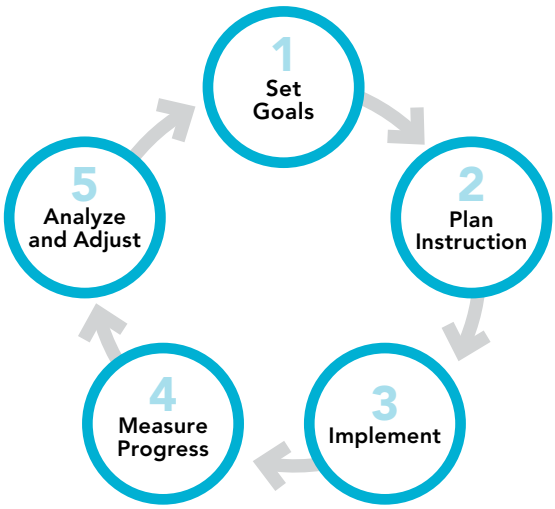
INTRODUCTION TO IMPLEMENTATION SCIENCE

A structured, evidence-based approach to literacy instruction is essential, starting from students' early years of schooling. Literacy researchers have established what students need to know and be able to do to become successful readers, and there is wide consensus on how best to effectively teach these skills (National Institute of Child Health and Human Development [NICHD], 2001). This paper begins with an overview of the five steps of implementation, with particular attention to implementing evidence-based early literacy programs or other innovative instructional approaches that are new to a district. After reviewing the five steps of implementation, we provide practical evidence-based guidelines for planning and implementing early literacy programs in both an in-person and remote learning environment that include instruction in the essential elements of an ideal early literacy program: phonemic awareness, phonics, fluency, vocabulary, comprehension, content knowledge, language skills, and writing.

THE FIVE STEPS OF IMPLEMENTATION

STEP 1: Set Goals. No one questions the importance of ensuring that schools develop confident, skillful readers and writers. Educators and parents, the public at large, and policy makers all value this goal, and determining to act on this shared goal is the start of implementing an evidence-based early literacy program. Thus, the first step to full implementation is to ***Set Goals.*** This critical step is only the start of a process that ultimately involves moving through the five steps depicted in Figure 1.

FIGURE 1: Model for Introducing a New Initiative into Educational Contexts



STEP 2: Plan Instruction. The second step in the cycle toward full implementation is to ***Plan Instruction***. As they learn the new program or approach, teachers, often working with coaches or administrators, create big picture plans for instruction. These lesson plans should be agreed upon, but also flexible enough that they allow teachers to adjust as needed, so that each daily and weekly plan is appropriate for their particular students. As discussed later in the paper in Step 2, lesson plans should include time allocations for the literacy block, along with specific learning objectives, strategies to be taught, and methods for determining students' mastery.

STEP 3: Implement. This preliminary effort to plan instruction may extend into the beginning weeks of the school year, as coaches support teachers, but the next stage in the cycle is for teachers to ***Implement*** the program daily, in real time, with their students. Teachers will be expected to teach in accordance with the design of the program, that is, with fidelity. High-quality implementation is essential when adopting a new educational program or approach, but teachers also need time to learn what fidelity means and they need support from coaches and administrators. Implementation research has found that teachers may need as long as three years to fully understand a new program (Jackson et al., 2018).

STEP 4: Measure Progress. Strong evidence-based programs include provisions that allow teachers to accomplish the next step in the cycle, that is, to ***Measure Progress*** as they and their students move through the school year. Many programs include formative and summative assessments aligned to their instructional routines, and there are also numerous valid and reliable assessment measures available that are easy for teachers to use. Teachers and coaches will find data from these assessments invaluable for determining students' accomplishments, for making grouping decisions, and for identifying when students might need more intense help.

STEP 5: Analyze and Adjust. Teachers, coaches, or school administrators may have a hunch that a program needs to be modified in some way, but hunches need data to support them if they are to bring about change. Throughout implementation of any program, it is important to collect different forms of data that measure progress and then to ***Analyze and Adjust*** according to what the data show. Although data may suggest that all students are progressing toward established goals, it is more likely that analysis will point to the need for some adjustments to their lesson plans. Adjustments may be minor—obtaining more trade books at different reading levels—or they may involve more significant changes.

IMPLEMENTING EVIDENCE-BASED EARLY LITERACY PROGRAMS

Attention now shifts to how the five steps for introducing a new evidence-based educational program build on each other as actual planning and implementation roll out in schools and classrooms. Regardless of the developer, evidence-based early literacy programs should include the five essential elements as defined by the National Reading Panel (NICHD, 2000) as well as content knowledge, language skills, and writing. Increasingly, programs also include writing because writing is a valuable tool for learning, communicating, and self-expression (Graham et al., 2012). See Table 1 for descriptions of the essential elements of a literacy program and brief summaries of their evidence base.

TABLE 1: Essential Elements of Evidence-Based Early Literacy Instruction

Essential Element	Description	Evidence
Phonemic Awareness	Understanding that spoken words consist of smaller parts or phonemes	Explicit instruction in phonemic awareness improves students' acquisition of beginning reading skills.
Phonics	Recognizing the relationship between phonemes and printed letters and understanding how to use this knowledge to read and spell	Explicit instruction in phonics benefits students from kindergarten through elementary school.
Fluency	Being able to read quickly and with understanding; putting the right feeling, emotion, or emphasis on the right word or phrase	Fluency improves students' abilities to recognize new words; read with greater speed, accuracy, and expression; and better understand what they read.
Vocabulary	Recognizing and figuring out word meanings	Vocabulary instruction and repeated contact with vocabulary words strengthen reading comprehension.
Comprehension	Understanding what is read at a literal and more advanced level	Explicit instruction in strategies such as creating and answering questions improves reading outcomes.
Knowledge	Acquiring facts and information on a topic or in a subject domain	Deepening students' knowledge in content-area subjects helps students connect what they know to new knowledge and allows them to comprehend text easier.
Language	Consisting of phonology, semantics, syntax, morphology, orthography, and pragmatics	Explicit instruction in teaching the structure of language helps students gain a deeper understanding of the meaning of words and the texts.
Writing	Being able to express their ideas in writing by using the steps in the writing process	Explicit instruction in the writing process and in skills such as handwriting, spelling, etc. benefit students' literacy growth.

Source: Foorman et al., 2016; Graham et al., 2012; NICHD, 2000.

STEP 1: SET GOALS

Evidence-based, structured early literacy programs include long- and short-term goals for each of these essential elements as they lay out an instructional pathway toward reading achievement. Together, the short- and long-term goals and objectives for literacy instruction at each grade lay out a logical roadmap for teaching and learning. Long-term goals can be thought of as the ultimate end of a learning progression, such as students' having a rich and varied expressive and receptive vocabulary that allows them to read grade-level texts, write to express their ideas, understand what they hear, and speak using age-appropriate words and terminology. Short-term goals build from the easiest skills and strategies to those that are more complex to ensure that students' learning is complete. Thus, using morphology as a word-learning strategy would be one short-term goal that students need to master along the way toward the long-term goal.

Both short- and long-term goals need to be specific and actionable, and evidence-based programs also provide ways to measure that students have mastered them. See Table 2 for an example of midyear goals for Grade 2 early literacy instruction. Also see Appendix A for an expansion of this list that includes representative long- and short-term goals for Kindergarten through Grade 2.

TABLE 2. Midyear Goals for Essential Elements of Early Literacy Instruction in Grade 2

Literacy Elements	Grade 2 Midyear Literacy Goals
Phonemic Awareness, Phonics	By the middle of Grade 2, students will: • Be able to substitute, delete, and add phonemes to given words to form new words in different oral and written activities • Be able to decode multisyllabic words
Fluency	By the middle of Grade 2, students will be able to: • Read 65 words per minute from a grades word list, such as the Oral Reading Fluency subtest of DIBELS • Read a grade-level passage aloud with appropriate accuracy, rate, phrasing, and expression as measured by a fluency rubric
Vocabulary	By the middle of Grade 2, students will be able to: • Independently learn and use unfamiliar words introduced in stories and informational texts • Make inferences about word meaning based on its use in oral language exchanges and in what is read
Comprehension	By the middle of Grade 2, students will be able to demonstrate comprehension of a grade-level narrative text by orally or by creating a graphic organizer that: • Shows the beginning, middle, and end of the story • Lists the main characters • States the theme of the story in one's own words (e.g., the importance of friendship, courage, etc.)
Language	By the middle of Grade 2, students will: • Understand and be able to use literary vocabulary accurately, e.g., terms like rhyme, syllable, base/root word, prefixes/suffixes, compound words
Writing	By the middle of Grade 2, students will be able to write informational/explanatory or narrative texts that: • Are at last one page long, introduce and develop their thoughts and end with a clear sense of closure as measured by a grade-appropriate writing rubric • Show appropriate mastery of spelling and grammatical rules as measured by a grade-appropriate writing rubric

STEP 2: PLAN INSTRUCTION

With short- and long-term goals in place, teachers plan instruction for their students. The first factors that should determine their lesson planning are the time allocated to the literacy block and the materials and resources available to them and their students. The recommended minimum number of minutes to be spent in K–2 classrooms on the daily practice of foundational skills, such as phonemic awareness and phonics, is 45 minutes (Shaywitz et al., 1999), but a longer literacy block is needed to build students' fluency, vocabulary, and comprehension and to also give students opportunities to engage in the pleasures of reading and writing. The literacy block in early elementary classrooms is a busy time, and it should be protected from unnecessary interruptions.

Research (NICHD, 2000) recommends a daily literacy block that includes a minimum of 90 minutes devoted to reading instruction and knowledge building, but some researchers recommend far longer (2–3 hours) if writing instruction is included (Graham et al., 2012). See Table 3 for the recommended time allocations for implementing the science-based elements of an early literacy program.

TABLE 3. Time Allocations for the Evidence-Based Elements of an Early Literacy Program

	Phonological Awareness, Phonics, and Language	Fluency, Vocabulary, Comprehension, and Knowledge Building	Writing	Total Time
Kindergarten	45 min.	45 min.	30 min.	120 min.
1st Grade	40 min.	50 min.	30–60 min.	120–150 min.
2nd Grade	35 min.	55 min.	30–60 min.	120–150 min.

The recommended time allocations for the K–2 literacy block serve as guides as teachers prepare detailed short- and long-term plans for the instruction they will offer and the practice opportunities their students will have. Plans should reflect teachers' understanding of both evidence-based principles of early literacy instruction and knowledge of their students' learning needs. Four overarching principles guide evidence-based early literacy instruction:[1] [2]

1. **Systematic:** Instruction proceeds in a logical order from the easiest skills, strategies, and concepts to those that are most difficult.
2. **Cumulative:** Each step teachers present builds on students' previous learning.
3. **Explicit:** Skills, strategies, and concepts are taught directly so that students clearly grasp what they need to know and be able to do.
4. **Diagnostic:** Many opportunities for formal and informal assessments are built into daily activities, and teachers use resulting information to individualize instruction.

The short- and long-term goals and objectives for reading instruction at each grade essentially lay out a logical, cumulative roadmap for teaching and learning. By explicitly and systematically teaching the skills, strategies, and concepts encompassed in this roadmap, teachers help their students toward the goal of reading on grade level. The diagnostic nature of instruction allows teachers to identify skills students may not have fully mastered or misconceptions they are forming about how reading and writing "works" and to integrate this knowledge into their lesson planning and thereby enhance their ability to meet everyone's needs.

Detailed lesson plans are essential, and they can take many forms, depending on the program being taught or the requirements of the school or district. The level of detail in the lesson plans will also differ according to their scope, that is, whether the plan covers a day, a week, or a month. Lesson plans will likely differ somewhat from teacher to teacher, for example, to reflect the level of differentiation needed for striving readers or for those reading above grade level. The materials available will also influence lesson planning. For example, if tablets and high-quality educational software are available, teachers can use them to help differentiate instruction. Having a well-resourced classroom library also contributes to the effectiveness of students' independent reading time.

[1] See for more information: http://reading.uoregon.edu/big_ideas/voc/voc_skills_goals.php
[2] See Big Ideas in Beginning Reading, www.reading.uoregon.edu

Daily lesson plans should start with a review of previously taught strategies, skills, or content to ensure that students are ready for the day's instruction. Effective plans usually include some of these common features:

- **Review** of previously taught skills, strategies, or content; reteaching as needed.
- **Development of background knowledge and vocabulary** needed to understand key strategies, skills, and concepts.
- **Explicit instruction** of new material in which the teacher discusses the purpose of the strategy, models using the strategy, and checks that students can independently describe the strategy. This approach can also be used to determine what students may already know about content that will be taught in new lessons and vocabulary needed to discuss it.
- **Guided practice** of new material during which students have multiple opportunities to practice using the strategy with feedback from the teacher.
- **Independent practice** of new material in the context that students will use the strategy on their own, with the teacher providing feedback as needed. This helps students integrate the strategy with skills they have already mastered.
- **Formative assessment** to assess students' mastery of the objectives of instruction.

The actual number of minutes in a school's literacy block and the needs of students will determine how teachers divide up the time devoted to reading and writing and how they plan instruction within each block of time.

Teachers' knowledge of how young students learn should also guide them: students benefit from exposure to multiple examples and non-examples for strategies and skills; they need to know how to use these strategies, as well as how to use them in different settings (such as narrative and informational texts); students respond well when teachers scaffold instruction to help students understand what is being taught; and students benefit from many opportunities to practice new skills and strategies in groups and independently. See Table 3 for a sample lesson plan for teaching vowel teams to second grade learners.

Additionally, all materials and selected texts should include characters of diverse backgrounds and reflect various cultures to provide opportunities for all children to see themselves. Culturally responsive teaching refers to practices and approaches that support culturally and linguistically diverse students who are often marginalized in schools to build their confidence and competency to achieve academic success (Darling-Hammond & Cook-Harvey, 2018). The practice of creating a culturally responsive environment begins with noticing one's own biases and building relational trust with students by honoring their stories and listening to their emotions (National Equity Project, 2020). Educators should strive to create a classroom environment that fosters appreciation and respect for all people and cultures.

TABLE 3. Sample Grade 2 Small-Group Lesson Plan for Phonics (Vowel Teams)

Time Allotments	Purpose	Activity Description
1–2 min.	Warm-up, Welcome, Set Purpose	
3 min.	Review	**Review/Visual Drill** **1.** Quickly review previously taught terminology: vowels, consonants. • Review previously taught vowel rules with examples, using letter tiles to show how some one-syllable words are formed: o CVC: kit, mat, not o CVCe: kite, mate, note **2.** Have students state rule in own words and ensure that all understand the difference that an -e will make to a CVC pattern; ask for examples of CVCe words **3.** Say: *Today we're going to learn some new ways vowels work together when they form vowel teams.*
10 min.	Explicit Instruction	**Explicit Introduction of Vowel Teams** **1.** Teacher gives explicit definition of vowel teams using common exemplars**:** *a vowel team occurs when two vowels work together to make one long sound* • Teacher uses a think aloud process and letter tiles; teacher says, "Let's look at how this works;" teacher models the word construction process o Makes the word "ran" using letter tiles; asks who can read the word; and ask someone to use it in a sentence o Replaces -a with -ai to make "rain" and repeats the process, correcting students if they do not apply the -ai rule correctly o This process continues with several more examples until students understand the rule. • Teacher restates the definition of a vowel team and what its use does: *make the first vowel long* o Suggests that the word "rain" be the key word to remember the sound **2.** Teacher introduces a second vowel team -oa using the words "got" and "goat" as exemplars; teacher and students follow the same protocol used for -ai: teacher constructs words with letter cards to demonstrate the rule that the first vowel in a word with -oa will be long • Teacher suggests that the word "goat" would be a good key word to remember
10 min.	Group Practice	**Group Guided Practice of New Vowel Teams** **1.** Teacher reminds students of rule they will be applying in reading a series of words **2.** One by one, teacher presents words with the vowel teams and asks individuals to read the words: • Pail, bait, tail, etc. • Coat, loaf, soap, etc. • Approximately 8 more words in mixed order **3.** Teacher asks students to restate the rule they have been applying **4.** Supply additional practice activities and check for students' understanding
10 min.	Independent Practice, Formative Assessment	**Independent Practice as Formative Assessment** **1.** Teacher gives students a word list with common words that exemplify the vowel team rule they have just learned **2.** Their assignment is to read the words silently to themselves and then to write sentences using 5 of the words: • Tail, stain, paint, grain, chain • Soap, boast, loaf, coat, boat • Students turn papers in after literacy block and teacher notes the extent to which students have applied the new phonics rule correctly o Teacher can also use the sentences to determine other decoding/encoding issues students may have.

STEP 3: IMPLEMENTATION

With their daily lesson plan in place and their weekly and longer-term goals to guide them, teachers implement their plans in the classroom. No matter how well-planned instruction is and no matter how experienced teachers are, the best early elementary classrooms are always dynamic, and sometimes hectic places, especially during the literacy block where students are engaging in many different learning activities. As a guide and reminder of what should happen in each lesson, teachers can use a checklist to ensure they meet the criteria for evidence-based instruction. By reviewing a checklist at the end of the literacy block (or at the end of the day), teachers can evaluate their own effectiveness, as well as the responsiveness of their students, so that they can adjust their lesson plans if needed, ensuring that all students learn. See Table 4 for a sample Early Literacy Lesson Implementation Checklist. Appendix B has a higher-level checklist of evidence-based best practices for literacy that includes key factors in the ideal literacy environment and aspects of formative assessment.

TABLE 4. Implementation Checklist for an Early Literacy Lesson

Implementation Checklist for Phonics Instruction	Questions for Teacher to Ask	Notes
Review • Teacher provides a quick review of pre-requisite skills and relevant vocabulary (e.g., short and long vowels; vowel patterns [CVC, CVCe])	• Can students define terms in their own words?	*Teacher uses these spaces to record answers to questions and to make notes about student performance*
Explicit Lesson Introduction and Goal Statement • Students will understand the concept of "vowel teams" and be able to construct words that use them	• Are the right students in the group and are the right materials (e.g., manipulatives, etc.) readily available?	
Explain, Model, and Check for Understanding • Teacher explains "vowel teams" and uses a think aloud[3] while demonstrating how decodable CVC or CVVC words are changed by replacing a short vowel with a vowel team • Teacher asks open-ended and guiding questions about how substituting vowel teams changes the pronunciation of words	• Can students answer guiding questions about teachers' explanation and demonstration? • Can students explain the process that has been modeled?	
Student Practice • Students take turns using manipulatives to substitute vowel teams for the short vowels in easily decodable words • Teacher gives feedback on student performance	• Who (if anyone) seems to be having trouble completing the practice activity? • Who may need additional instruction?	
Progress Monitoring • Teacher asks students to restate what they have learned. • Teacher gives assignment for work with vowel teams that students complete independently and turn in at the end of the literacy block • Teacher asks students to restate what they must do.	• Who (if anyone) still seems to be struggling? • What seems to be the most confusing aspects of application of this vowel rule?	
Adjusting and Differentiating • Teacher checks practice activity and makes adjustments to the next lesson	• Did any students seem to struggle with the assignment? • Who might need to repeat the lesson or need to be assigned to a different instructional group?	*Teacher reviews notes in planning for follow-up instruction and activities.*

[3] When using a "think aloud" with students, the teacher explains what an "expert" reader knows and is able to do in applying a skill or understanding a concept. For example, in helping students read the word "unforgettable," the teacher might say, "First I'll look for a word that I can recognize…I see 'forget.' Then I'll look at the other word parts and see what they mean."

STEP 4: MEASURE PROGRESS

Experienced teachers can often discuss students' progress with high levels of accuracy, especially if they take seriously the charge that their instruction should contain a ***diagnostic*** component. Teachers' knowledge of students' accomplishments and needs should not be underestimated, but this knowledge becomes even more valuable when teachers also use formative and summative assessments as a routine part of their instruction. Some formative assessment approaches are built into the instructional process, for example, teachers who listen carefully to students' oral reading are engaging in a form of formative assessment because they are listening to how students use the strategies and skills they have been learning.

Formative assessments provide teachers with valuable tools to use to supplement and enhance what they observe when interacting with students in small and large groups, when watching their students at work independently or with others, and when analyzing students' work products. Most programs recommend using them throughout the year, sometimes as often as weekly. Many formative assessments provide benchmarks against which to compare students' progress at a given point against a determined set of standards (e.g., a scope and sequence) to help teachers check up on how students are progressing toward established short- and long-term goals. Other formative assessments provide more specific diagnostic information, such as specific skills that have been mastered and skills that still need to be developed.

Data from formative assessments are invaluable because they help teachers determine instructional groups for the literacy block, allowing them to differentiate instruction according to students' learning. According to the National Reading Panel, students learn best in carefully constituted small groups, even more so than if taught one-on-one (NICHD, 2000). Grouping should be a dynamic, flexible practice, with instruction determined by student need and students' entry into and exit from specific groups determined by their progress.

Although some formative assessments are relatively standardized, other approaches can easily be built into instruction, such as a series of open-ended questions a teacher would ask orally at the end of a small group lesson. See Table 5 for a description of some common informal and formal approaches for gathering formative assessment data on students' early literacy progress.

TABLE 5. Commonly Used Approaches for Formative Assessment of Students' Early Literacy Knowledge and Skills

Assessment Type	Description and Use
Portfolio Assessment	Teacher selects several samples of individual's assigned work toward mastery of one or more instructional goals. • Teacher evaluates work objectively to determine students who may need review and reteaching.
Open-Ended Question	Teacher prepares open-ended questions and exemplar responses and asks the questions at the end of an instructional sequence. • Teacher notes the adequacy of students' responses (e.g., on the implementation checklist) and provides reteaching as needed.
Spelling Inventory	Teacher conducts a "spelling test" with small or large groups to measure mastery of letter-sound correspondences. • List of words should contain both familiar, high-frequency, or regularly-spelled words and more challenging words that may require skills students have not yet mastered. • Teachers analyze spelling results to determine potential misunderstandings in letter-sound correspondences.
Performance Task	Students independently complete an age-appropriate but complex learning activity that requires them to demonstrate their knowledge, understanding of skills, strategies, or content that have been previously taught. • Teacher evaluates work product, such as answers to comprehension questions or a short, written passage against a rubric.
Quiz	Students complete an independent activity that measures mastery of a learning goal or objective that has been taught in small- or large-group instruction.
Oral Reading Fluency	Teacher listens as student reads an unfamiliar, leveled text orally. Teacher records how many words the students read accurately per minute, notes the students' prosody and expression, and asks comprehension questions.

Summative assessments are used less frequently, usually at the end point in a learning continuum, such as the end of a unit, reporting period, or at the end of the school year. These assessments measure what students have learned overall against norm- or criterion-referenced performance levels that rigorous research has found to be the most important contributors to overall reading proficiency.

In early literacy, summative assessments measure mastery of more skills and strategies than formative assessments. They ask students to apply their skills and strategies under somewhat controlled conditions, that is, independently, rather than in a small group or with a partner. Although some summative assessments are tests in the traditional sense of the term, early literacy summative assessments can take many forms.

For example, a teacher might read a story to a group of students and ask them to create graphic organizers to demonstrate their comprehension. Similarly, approaches such as Spelling Inventories that are often used as formative assessments can be made to cover a broader range of skills and strategies and used for summative purposes.

Some widely used assessments and the elements of a structured literacy program that they measure are included in Table 6. Some of these assessments focus on a small subset of skills; others are broader in their scope; some are computer delivered; and others are available only in print format. Some digital programs include a dashboard of students' scores that help teachers keep track of their students' progress as a reference for planning and grouping decisions.

TABLE 6. Early Literacy Assessments and Skills Assessed

Assessments	Skills Assessed
Diagnostic Decoding Survey (DDS)	• Decoding skills
DIBELS 8th Edition	• Letter naming fluency • Phonemic segmentation • Nonsense word reading • Word reading fluency • Oral reading fluency • Comprehension
HMH Phonics Inventory	• Letter recognition • Sight word (high-frequency word) fluency • Nonsense word decoding fluency
HMH Reading Inventory	• Phonological awareness fluency • Letter knowledge fluency • Sight word (high-frequency word) fluency • Nonsense word decoding fluency • Comprehension
Qualitative Reading Inventory–6	• Print concepts • Word identification • Passage comprehension • Reading rate • Oral reading fluency
Renaissance Star Reading Assessment	• Phonemic awareness • Phonics • Vocabulary • Comprehension

Although they differ from formative assessments in their purpose and time of administration, summative assessments also play a

diagnostic role. Their data allow teachers to fine-tune their grouping decisions, judge the rate of learning of students in their classes, and potentially determine those students who would benefit from additional instruction through a Tier 2 intervention. In some cases, summative assessment data can be part of the information used to recommend more extensive testing of young learners, for example, to identify learning disabilities early in students' school lives so that they get assistance before they experience greater risk for failure.

STEP 5: ANALYZE AND ADJUST

Data collected from both formative and summative assessments allow teachers to analyze students' progress on an ongoing basis and to adjust their short-term goals and lesson plans.

Such a data-driven evaluation process enables teachers to identify students who are progressing, those who need some reteaching in order to progress, and those who may be at risk for reading difficulties. Changes that a teacher might make include:

- **Reteaching,** for example, explaining a decoding strategy (e.g., the CVC vs. the CVCe pattern) to a small group of students for a second time, using different examples or more manipulatives to allow them to "catch up" to their peers

- **Regrouping,** that is, reconstituting membership in groups so that students who are struggling receive instruction that helps them overcome misconceptions about skills (e.g., review "irregular" spelling patterns) or relearn what they have misunderstood
    - Regrouping may also be necessary because some students need additional challenges, such as opportunities to read more advanced books

- **Provide additional practice,** for example assigning work with a computer-adaptive digital program that adjusts the presentation of exercises to individual's instructional needs
    - Assigning students with lower oral reading fluency (ORF) to listen to tapes of familiar stories while following along with the printed text or to work as a "reading partner" with a peer with stronger ORF skills

- **Provide additional instruction,** for example, students' hesitant or disfluent oral reading often suggests they are not comprehending what they read; instruction to enrich students' vocabularies, often provides a boost to slower readers' comprehension abilities and to that of all students in a class (see Lovett et al., 2017)
    - Explicit instruction on synonyms or creation of "word walls" expands the vocabularies of all students

- **Changing instructional material,** for example, introducing new ways to practice skills, such as partner reading, working on a tablet, or completing a graphic organizer rather than answering comprehension questions; assigning reluctant readers informational rather than narrative books during independent reading or having students write imaginative stories rather than personal narratives

- **Teaching metacognitive skills,** for example, teaching students to monitor themselves as they read, to ask themselves if what they are reading or writing makes sense or to annotate their reading with Post-it notes of questions they want to ask

The process of data analysis should also encourage teachers to study the patterns of students' results on assessments to identify those areas where their own instructional approaches might need to be improved or even changed. This may be especially true as teachers learn to implement a new program or approach, one that requires them to perform previously unfamiliar instructional roles, such as using a blended learning program that requires young learners to work independently on tablets or integrating writing into their early literacy instruction. Asking for additional coaching, professional development, or resources should not be considered a sign of weakness; rather, doing so shows that teachers are working toward professional growth and high-quality implementation of the new program.

ADAPTING HIGH-QUALITY INSTRUCTION TO A REMOTE LEARNING ENVIRONMENT

The usage of technology within the literacy classrooms has become widespread and paramount. Blended teaching and learning combines online delivery of educational content with the best features of classroom interaction and live instruction to personalize learning, allow thoughtful reflection, and differentiate instruction from student to student across a diverse group of learners (Watson, 2008). A blended teaching and learning model can be implemented within an in-person school setting but can be leveraged for remote learning as well.

The remote learning environment consists of the effective use of both synchronous and asynchronous activities, which requires alignment with the goal of the learning activity (Boettcher, 2011). **Synchronous** learning occurs when students and teachers are participating in a discussion or activity at the same time, either in person or remotely. Remote synchronous interactions are often supported by technology, including the use of internet resources and applications. This includes "face-to-face" instruction in real-time (e.g. Zoom meetings) and online chat sessions. Synchronous activities may be used to establish connection and community, deliver new content, brainstorming, sharing discussions, etc.

Asynchronous learning occurs when students work alone, or with the help of a family member, on learning resources curated by a teacher or a program. Asynchronous learning can happen on the learner's own schedule. Examples include using Computer-Assisted Learning (CAL) programs, posting assignments online, pre-recorded instructional videos (e.g. YouTube), and discussion forums. Asynchronous activities may be better suited for activities that require additional practice, deep thinking, planning, or writing, or when allowing students flexibility over their time.

Synchronous

- Live content mini-lessons
- Lesson follow-up (debrief a lesson or expert video)
- Assignment check-in (Q&A, clarity, technical issues)
- Online discussions, debates, brainstorming, etc.
- Teacher read-alouds
- Live reactions

Asynchronous

- Teacher-recorded content mini-lessons
- Tasks assigned on an internal or external website or platform
- Online practice (phonics skills, high-frequency words, vocabulary, etc.)
- Expert videos or tutorials (view and respond)
- Recorded reactions
- Digital games
- Digital book reading (eBooks, audiobooks, online libraries)

Unplugged

- Choice boards/Menu tasks
- Assignments that can be done offline and submitted via email, free app, or hard copy (workbooks, handouts)
- Handwriting practice and writing assignments
- Open-ended prompts such as:
  - Read a book and …
  - Make your own …
  - Practice by …
  - Use materials you have to …
- Independent book reading
- Multi-sensory activities

SUPPORTING AND SUSTAINING A NEW PROGRAM

For a new initiative—including introduction of new educational programs or approaches—to be truly successful requires local efforts to build capacity, communication, and commitment. This can be a long-term process. In their review of studies of educational programs introduced into districts, Jackson and colleagues (2018) found that districts that build strong teams and focus continually on implementation can expect 80 percent successful use of effective practices within three years.

To build capacity, teachers and other staff must participate in **professional learning** that fully informs them about anticipated changes in practice or routines, helps them understand new guidelines for implementation, supports them as they begin implementation. It is also important that teachers understand the measures that will be used to gauge that goals have been met. Professional learning cannot be "one shot," large-group meetings at the beginning of the school year; it must be on-going, embedded in educators' professional development plan, and ideally include support from school-based and district coaches.

Successful professional learning about a new program or approach will reassure teachers that their professional knowledge and expertise will be the foundation of the innovation's success. They may be asked to make adaptations to their teaching practice (for example, assigning children more work on individual tablets), but doing so will ultimately benefit students and enhance teachers' abilities to meet every student's needs. Additionally, the professional learning teachers receive should involve digging into new curriculum materials and planning the practicalities of how they will begin the school year, how they will allocate the time in their literacy block, and how they will measure their students' progress.

Open **communication** is essential, and teachers need to know right from the start whom they can contact if they need help. Some research (Salinger et al., 2010) suggests that implementation is enhanced when someone plays an intermediary role. This person can "serve as a conduit of information, expectations, guidelines and general 'know how' back and forth from central offices to principals' offices to classrooms" (Salinger et al., 2010, p.8). For example, if individuals serving this role notice that teachers in a school seem to need additional professional learning opportunities, they can bring this message forward; alternately, teachers themselves may ask an intermediary to help expedite problems when a school's technology infrastructure impedes use of a blended program. Quickly resolving the issues that are inevitable as a new program is implemented contributes to its acceptance and successful use.

Equally important, open communication about what seems to not be working in a new program can lead to adjustments in goals or expectations. For example, a program may not include adequate accommodations for students with disabilities or those who are learning English. Discussions between teachers and their coaches or other intermediaries about such issues can result in adjustments that can improve the new program's likelihood for success with *all* students.

Communication to parents is also important so that they understand the new program or approach that is being introduced, its value for their children, and the ways in which they can support its implementation, for example by reading with their children every day.

Community building comes from efforts to gain buy-in to new program ideas and builds commitment to successful implementation. Analysis from assessment data plays an important role in deciding if the goals of a program are being met and may indicate aspects of a program that need to be adjusted. But user experiences, that is, the attitudes and reactions of the teachers responsible for implementing a program and ensuring students' success, are also important. Asking for input and ideas from teachers about how a program is working for them and their students can build an *implementation community* of individuals who share responsibility for delivering the best quality evidence-based instruction possible. So long as teachers know that there will be no reprisals for voicing their opinions, it can be beneficial to ask them to participate in informal focus groups or to complete surveys, yielding invaluable information about implementation, and potentially changes that are needed. Resulting changes will help create a local definition of fidelity to a program model that honors the intent of the program developers *and* enables teachers and administrators to meet the goals they have set for their teaching and their students' learning.

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ACKNOWLEDGEMENTS

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APPENDIX A

TABLE A1: Selected Long- and Short-Term Goals for Kindergarten through Grade 2

Phonemic Awareness, Alphabetics, and Phonics	
K–2 Long-Term Goals	By the end of Grade 2, students will be able to accurately decode a grade-level text and answer questions that demonstrate their comprehension of the text.
Kindergarten Short-Term Goals	By the end of Kindergarten, students will be able to: • recognize all letter names and say the most common sounds associated with letters • segment individual sounds in words and blend letter sounds in 1-syllable words • blend to read CVC words in simple sentences and stories • decode at least 20 high-frequency words
Grade 1 Short-Term Goals	By the end of Grade 1, students will be able to: • produce the sounds made by common letter combinations, including consonant blends • decode compound words that contain common word parts • apply phonics knowledge to spell single-syllable regularly spelled words correctly and independently
Grade 2 Short-Term Goals	By the end of Grade 2, students will be able to: • read most sight words accurately • decode and read compound words, multisyllabic words, contractions, possessives, and words with inflectional endings • use phonetic strategies to decode and to spell unfamiliar words
Fluency	
K–2 Long-Term Goals	By the end of Grade 2, students will be able to read grade-level passages about familiar topics aloud with appropriate accuracy, rate, phrasing, and expression as measured by a fluency rubric.
Kindergarten Short-Term Goals	By the end of Kindergarten, students will be able to: • read simple high-frequency words with automaticity (e.g., *and, the, it*) • use a variety of strategies to decode simple words not recognized by sight • echo read with fluency either in a small group or while using a digital program
Grade 1 Short-Term Goals	By the end of Grade 1, students will be able to: • read grade-appropriate connected text accurately, with 1 error per approximately 20 words • read grade-appropriate text with appropriate speed, saying approximately 1 word per second and with self-corrections as necessary • use appropriate inflection for end marks, commas, quotation marks
Grade 2 Short-Term Goals	By the end of Grade 2, students will be able to: • read approximately 90–100 words per minute in grade-appropriate texts • self-correct word recognition errors • comprehend text to infer mood/feeling at appropriate moments and modulate voice to reflect the mood/feeling

Vocabulary	
K–2 Long-Term Goals	By the end of Grade 2, students` will possess adequate vocabulary to understand grade-level texts when they read, understand and participate in conversations with peers and teachers, and be able to determine meaning of most unfamiliar words.
Kindergarten Short-Term Goals	By the end of Kindergarten, students will be able to: • name pictures of common objects and use words to label common concepts • use words to describe location, size, color, and shape • acquire new vocabulary through stories and instruction
Grade 1 Short-Term Goals	By the end of Grade 1, students will be able to: • acquire unfamiliar words introduced in stories and informational texts and use them appropriately • demonstrate increasing knowledge of word meanings and use in speaking to others and in writing • sort grade-appropriate words into categories with or without the aid of pictures (e.g., creating complex word webs)
Grade 2 Short-Term Goals	By the end of Grade 2, students will be able to • learn and then use unfamiliar words that are introduced in narrative and informational texts • understand, will be able to explain, and use common antonyms and synonyms • examine word usage in effectiveness in what they read and hear to expand their own vocabularies
Comprehension and Knowledge Building	
K–2 Long-Term Goals	By the end of Grade 2, students will be able to read and comprehend grade-level text by accurately retelling the text, gathering information from texts, and answering factual, inferential, and critical thinking questions.
Kindergarten Short-Term Goals	By the end of Kindergarten, students will be able to: • retell a familiar story, using illustrations from books if needed for support • answer who, where, and what questions after listening to a sentence or short paragraph • connect events, characters, and actions in a story the teacher has read or they have heard recorded to their own life experiences
Grade 1 Short-Term Goals	By the end of Grade 1, students will be able to: • answer who, what, when, where, and how questions after listening to or reading paragraphs or grade-appropriate texts • retell a story orally or in some other format (e.g., story map) and include characters, settings, and important events in chronological order • monitor comprehension by stopping while reading to assess understanding and use prior knowledge or other aids to clarify meaning
Grade 2 Short-Term Goals	By the end of Grade 2 students will be able to: • distinguish main idea/theme from details, fact from opinion, cause from effect in narratives and informational texts and identify characters' actions, motives, emotions, traits, and feelings • apply what has been read in other situations, for example, in one's writing or conversations or in new reading experiences • read for understanding, using prior knowledge as appropriate to clarify understanding and making connections across what is read

Writing	
K–2 Long-Term Goals	By the end of Grade 2, students will be able to plan and produce grade-appropriate writing that is clear and coherent and that demonstrates development, organization, and style that are appropriate to task, purpose, and audience; if available, they should be able to use technology to assist in their writing.
Kindergarten Short-Term Goals	By the end of Kindergarten, students will be able to: • produce all the letters of the alphabet (upper and lower case) and know the sounds of most if not all of them • compose a simple idea (e.g., a story or information) with at least 2 details and either write it themselves or dictate it to the teacher • use simple sentence patterns correctly in own writing or in dictation to teacher
Grade 1 Short-Term Goals	By the end of Grade 1, students will be able to: • spell high-frequency words they have studied accurately and encode single-syllable regular words correctly and independently • compose simple stories or informational texts that demonstrate awareness of appropriate structure, use transitional words, and that show logical sequencing • use a variety of sentence patterns with fluid rhythm that is easy to read aloud
Grade 2 Short-Term Goals	By the end of Grade 2, students will be able to: • use phonetic strategies to spell unfamiliar words, in addition to spelling high-frequency words correctly • produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience • use varied sentence types and vocabulary and introduces rhetorical devices such as dialogue or questions

APPENDIX B

Instructional Practices Inventory

Literacy

Literacy Solutions
From Houghton Mifflin Harcourt.

At HMH, our coaching model is learner focused, partner based, and data driven. We are looking forward to partnering with you on your learning journey. Together, we will provide you with access to instructional practices to increase student learning and engagement in your classroom. Use this inventory to identify practices that are already in place in your classroom, and as a guide for areas you may want to work on with your coach.

Learning Environment

TEACHER

- Fostering curiosity in students as readers and writers.
- Structuring the class for independent work, pairs, groups, and whole class in a thoughtful and deliberate way.
- Implementing routines and procedures to maximize learning.
- Asking questions that promote high-level thinking and discourse.
- Providing a respectful, safe, and culturally responsive environment in which mistakes are seen as an opportunity to learn.

STUDENT

- Showing perseverance and effort when faced with challenging texts and tasks.
- Working productively in a variety of grouping structures.
- Taking academic risks and relying on one's own thinking and the thinking of other students.
- Listening and asking questions to clarify information and respectfully challenge ideas.
- Actively seeking to understand other perspectives and cultures.

Formative Assessment

TEACHER

- Using data to make instructional decisions based on student need.
- Providing feedback to students and structuring opportunities for peer feedback.
- Establishing and communicating the learning outcome(s) of the lesson and success criteria.
- Monitoring learning and adjusting teaching during instruction.

STUDENT

- Articulating what one is learning and why.
- Setting goals, identifying learning steps, and reflecting on progress.
- Applying teacher and peer feedback to strengthen and deepen learning.

Instructional Practices Inventory **Literacy**

Reading and Vocabulary

TEACHER

- Teaching foundational skills systematically and with systematicity. **(K–5)**
- Providing opportunities for students to regularly read independently.
- Guiding students to critically read and revisit complex text for different purposes.
- Prereading and analyzing text complexity to inform questions and tasks.
- Providing scaffolded supports, as needed, to support all students with access to complex texts.
- Engaging students in cross-textual analysis using a variety of genres.
- Explicitly teaching academic and domain-specific vocabulary.
- Modeling strategies to determine and clarify the meaning of unknown words in context.
- Building digital literacy skills for reading and viewing multimedia for a variety of purposes.
- Conferring with students to set goals and foster deep reading with purpose.

STUDENT

- Applying phonics and decoding strategies when reading. **(K–5)**
- Engaging in frequent, voluminous reading on a regular basis.
- Self-selecting a range of diverse texts for independent reading based on interest.
- Reading deeply and with understanding using comprehension strategies based on text and purpose.
- Analyzing across text to identify, evaluate, and synthesize multiple perspectives.
- Applying word-building and vocabulary strategies to unknown words while reading.
- Fluently using academic vocabulary and precise words in reading and discussing ideas.

Writing and Communicating

TEACHER

- Providing a variety of writing opportunities daily.
- Teaching and modeling the writing process (e.g., plan, draft, revise, edit).
- Teaching and analyzing use of author's craft and genre characteristics.
- Building knowledge of grammatical structures to support reading and writing about complex ideas.
- Structuring opportunities for students to engage in rich text-based conversations.
- Conferring with students to set goals and discuss decisions made during the writing process.

STUDENT

- Engaging in short and long writing tasks on a regular basis.
- Using the writing process to produce writing in a variety of genres and products.
- Citing specific evidence to support claims when writing about and discussing complex text.
- Giving, receiving, and applying feedback to revise written work.
- Applying and adapting discourse skills based on audience, task, purpose, and discipline.

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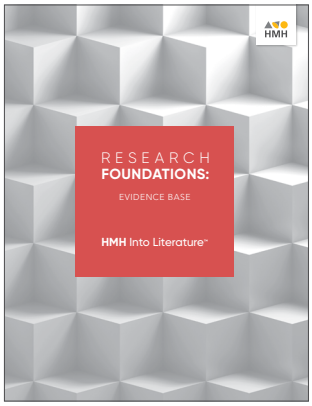
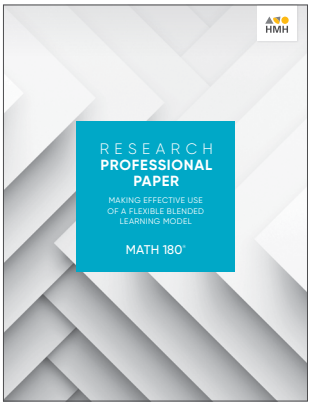
HMH RESEARCH PUBLICATIONS

Research Into Practice Into Results



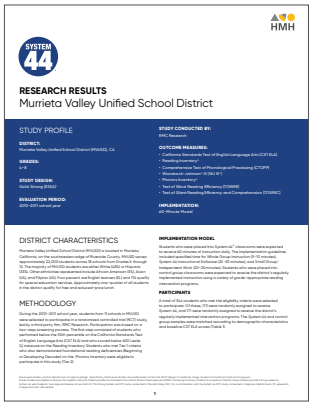
RESEARCH FOUNDATIONS PAPERS

Research Foundations papers provide an in-depth account of the theoretical underpinnings, evidence base, and expert opinions that guide the design and development of new and revised programs. These papers map known research and design principles to practical applications of the program.



RESEARCH PROFESSIONAL PAPERS

Research Professional Papers highlight an important theoretical construct, practical application, program component, or other topic related to learning in the context of HMH programs. They are authored by experts in the field, researchers, and thought leaders within the industry.



RESEARCH RESULTS PAPERS

Research Results papers summarize the findings from research studies conducted on HMH programs, including research conducted internally by HMH and externally by third-party research firms. Research Results papers document the efficacy of a program in terms of ESSA evidence levels: strong evidence, moderate evidence, promising evidence, and evidence that demonstrates a rationale for program effectiveness.

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