White Paper

# mCLASS Intervention

## From Science to Solution: Research Support for the mCLASS Intervention Approach to Reading Intervention

Diana Sharp, Ph.D.

June 2009

Amplify.

# Contents


**The Need for mCLASS Intervention** 1

**General Overview** 5

- Component Skills and Grouping Strategies 5
- Identification of Student Needs 7
- Scope of Lesson Content 9
- Designing Lessons for Instructional Intensity 12

**Skill-By-Skill Tour** 15

- Phonemic Awareness 18
- Systemsatic Phonics 21
- Word Recognition 25
- Fluency 28
- Vocabulary 33
- Comprehension Strategies 36
- References 42

**About the Author** 48

# The Need for mCLASS Intervention

"We learned from the longitudinal data that the problem of skill differences among children at the time of school entry is bigger, more intractable, and more important than we had thought"

— Hart & Risley, 1995, 193

"One-size-fits-all instruction will not do when working with struggling readers"

— Lipson, 2006, 397

These quotes summarize the two main findings from researchers about why it is so difficult to help all students read at grade level: (1) the amount of instruction that some students need is vast, and (2) the ideal content of instruction that students need varies, even among low-skilled readers.

To address these issues, many schools have become more systematic in how they identify students' needs and tailor reading interventions to fit those needs. Some of the most comprehensive of these approaches have evolved into Response to Intervention (RTI) systems, aimed simultaneously at providing effective intervention in regular classrooms and reducing inappropriate referrals for special education services (Gersten et al., 2009).

RTI deals with the first step to intervention success — providing the large amount of instruction needed — in two ways. First, it uses a strategy of early detection to identify students who need greater amounts of instruction so they can receive it before they fall farther behind and require yet more instruction. Second, RTI provides identified students with additional instruction by adding intensity to their classroom reading experience. Students classified with "Tier 2" needs meet in small groups where they get more teacher/student interaction and more frequent opportunities for skill practice and feedback than they receive in whole-class instruction or by working independently. Students classified with "Tier 3" needs receive even more instruction by meeting one-on-one and in small groups during reading time and sometimes during instruction allocated to other subjects (e.g., science and social studies).

RTI addresses the second step to effective intervention — the need to customize instruction — by employing assessments that frequently monitor students' progress and provide windows to their ongoing needs. Students receiving Tier 2 and 3 interventions are assessed regularly — at least monthly.

The federal Institute of Education Sciences (IES) recently released a practice guide (Gersten et al., 2009) designed to help schools implement effective, research-based RTI approaches. However, two major gaps remain between the resources teachers need to help all students read at grade level throughout schooling and the resources currently available for implementing effective reading intervention.

The first gap relates to strategies for increasing the amount of instruction, which low-skilled students need. The RTI strategies of small groups and more-frequent sessions deal with only one level of instructional intensity: the surface, or contextual level. The actual lessons delivered during these sessions can also vary widely on a deeper level of instructional intensity.

**Synchronizing Curriculum with Students' Varied and Specific Needs is a Significant Challenge**

Instructional intensity refers to the amount of learning offered by the actual design and content of the lesson. If teachers deliver lessons with low instructional intensity, students may not learn enough to successfully read at grade level, even if they are taught these lessons in small groups or in more-frequent doses. Our only chance to address students' vast needs is to make sure we teach sufficient amounts within the limited school day. We must scale our lessons' instructional intensity as high as possible, based on the latest scientific evidence about the design and content of effective programs.

Researcher-developed resources for intensive lesson content abound. However, they are widely scattered and often focus on only part of the landscape of reading skills. Ideally, in one place, teachers would find lesson content that (a) reaches the highest-possible instructional intensity and (b) clearly targets struggling readers' specific skill needs. Teachers need a rich resource, such as a lesson bank that makes vast amounts of instructionally intense lessons available. This ideal, comprehensive resource should provide lessons across the entire landscape of reading skills, including the often short-changed areas of comprehension and vocabulary.

Secondly, for effective intervention, teachers need tools that can match a student's skill needs to the lesson content. During the past several years, many groups, including Amplify, added features to assessments that suggest lesson content for a particular student or group of students. If this advice tied to a comprehensive bank of lessons, teachers could more easily

select optimal lessons to accurately meet students' needs, particularly when working with small groups. Current commercial programs tied to print technology also provide insufficient customization. These programs typically offer "differentiated" instruction via lessons tiered to "high-," "middle-," and "low-" skilled students. However, the programs' reliance on traditional textbook models makes it impossible to provide customized lesson plans for all possible combinations of skill needs for any particular group of students.

These gaps in available resources significantly increase the likelihood that the effectiveness of instruction for struggling readers within an RTI program — or any intervention program — may not sufficiently help those students read at grade level. Research shows interventions that do not offer a steep enough growth trajectory are simply not adequate: they do not close gaps in reading fluency or help students catch up to their peers (Torgesen, 2004). Low-skilled readers need a great amount of instruction, so we risk offering inadequate instruction if lessons lack intensity or don't match student needs. Without greater, more comprehensive resources for lesson intensity and matching instruction to student need, we risk failing our lowest-skilled students.

### Answering the Call: A New Sustainable Approach for Amplifying Capacity to Deliver Differentiated Instruction

mCLASS Intervention fills these gaps by breaking free of traditional technologies for commercial reading programs. mCLASS Intervention is the first program to fully use the power of new technologies for storing and retrieving a comprehensive bank of targeted, scientifically based lesson content, optimized for readers with the greatest skill needs; for helping teachers match this lesson content to student needs based on scientific assessment data; and for allowing teachers — not computers — to teach these lessons in powerful, small-group settings. In doing so, the mCLASS Intervention program offers the first major advance in customized reading instruction for students in need of intervention. Through its rich lessons bank and its technology-enabled capability to match data to instruction, the mCLASS Intervention approach to reading intervention may finally bridge the persistent gaps between research and practice and offer teachers the full solutions they need to help our low-skilled students read at grade level.

The remainder of this paper describes the research that supports the approach mCLASS Intervention takes to provide intense instruction and targeted lessons that optimally match students' needs. While this paper discusses the research using recent RTI frameworks, the same research applies to any rigorous plan for reading intervention. The first section of the paper focuses on a general overview of mCLASS Intervention design.

The second section provides a skill-by-skill tour of the mCLASS Intervention lesson bank.

**mCLASS Intervention: Breaking Free From Conventional Restraints**

- Sophisticated technology analyzes students' formative assessment data
- Groups students according to their item-level skills
- Generates 10-day sequences of teacher-led intervention synchronized to the pace and intensity each group requires

# General Overview

## Component Skills and Grouping Strategies

### What the Research Says

Even researchers who disagree about aspects of reading instruction agree that comprehension — reading for meaning — is the ultimate goal of all reading instruction (Snow & Juel, 2005). Researchers also agree that extensive, explicit instruction on the component skills of reading comprehension is effective for students at risk of school failure (National Reading Panel, 2000; Pressley & Fingeret, 2007).

Figure 1. Foundational Component Skills of Reading Comprehension

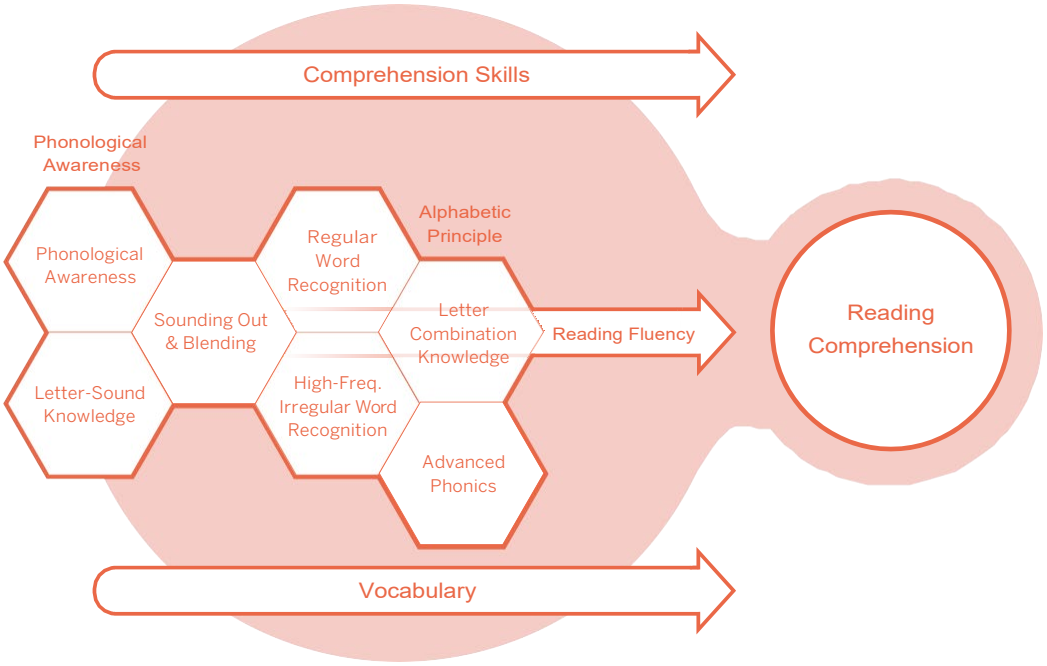



Figure 1 illustrates these foundational component skills of reading comprehension (Hoover & Gough, 1990). The central hexagons are decoding components that enable reading fluency. The

hexagons are arranged developmentally, earlier skills to the left of later skills. The hexagons are surrounded by comprehension and vocabulary skills that function reciprocally with decoding skills to help students understand what they read. The IES practice guide for RTI stresses that students in Tiers 2 and 3 should receive instruction on all of these skill components with curricula that "relate to students' needs and developmental levels" (Gersten et al., 2009, 9).

### What mCLASS Intervention Does

mCLASS Intervention uses fine-grain skill assessment data to identify student needs on the reading comprehension component skills shown in Figure 1. mCLASS Intervention uses an algorithm to group students with similar needs for extensive, explicit instruction. For students with decoding needs, the mCLASS Intervention algorithm starts with the earliest component skills needed, groups students with these needs in common, and assigns decoding instruction to match. Students with both decoding and language-comprehension needs receive skill instruction in both of these areas as early as kindergarten.

This approach to grouping is a clear advance over methods that group students based on overall levels of ability or risk, since research shows the needs of low-ability students can vary widely (Valencia & Buly, 2005). mCLASS Intervention ensures students within a group share the same needs and collectively benefit from the same targeted lessons. Furthermore, this method ensures that students who may fail to master a foundational skill at age-appropriate time points do not "fall through the cracks" and later lag behind their peers due to missed instructional need.

# Identification of Student Needs

### What the Research Says

The IES panel (Gersten et al., 2009) identified universal screening of student needs, beginning in kindergarten, as a critical first step in identifying students for Tier 2 and 3 instruction. Some of the panel's other specific recommendations for the assessment component of an RTI approach include:

- Use efficient, reliable, and reasonably valid measures.
    - Conduct a beginning-of-the-year screening and a second screening mid-year to offset the imperfections of available screening measures, especially for kindergarten and Grade 1.
- For students in intervention groups, include mastery checks or monitor student progress weekly, if possible, but no less than once a month.
- Use progress monitoring data to re-group students so intervention groups stay as homogeneous as possible.

### What mCLASS Intervention Does

The mCLASS Intervention program includes a comprehensive assessment system complete with efficient, reliable, and valid measures for phonemic awareness, decoding (nonsense words and real words), fluency, comprehension, and vocabulary.

In mCLASS Intervention classrooms, teachers administer universal screenings at both the beginning and the middle of the year. Assessments for phonemic awareness, nonsense-word decoding, and fluency come from the DIBELS® (Dynamic Indicators of Basic Early Literary Skills) battery. Universal screenings also measure receptive vocabulary, which the Amplify team developed specifically for mCLASS Intervention.

Progress monitoring occurs after every two-week lesson sequence, so the teacher can tailor the next lesson sequence to ongoing student needs and regroup students to keep intervention groups as homogeneous as possible. For phonemic awareness, nonsense-word decoding, and fluency skills, progress monitoring measures come from the DIBELS battery. For vocabulary, mastery checks replace progress monitoring.

One of the hallmarks of the mCLASS Intervention assessment component is the measures that add value to DIBELS. For example, the Nonsense Word Fluency (NWF) measure in DIBELS only assesses students' abilities to decode regular Consonant-Vowel-Consonant (CVC) and Vowel–Consonant (VC) words. DIBELS also does not include a real-word reading measure, which some researchers argue provides more critical and predictive information than non-word reading (Fuchs, Fuchs, & Compton, 2004). mCLASS Intervention assessment, however, provides this additional decoding and word-reading information through a Late-Decoding-Inventory. This inventory measures students' abilities to decode and read four additional types of words: (a) simple, regular words beyond VC and CVC structures, (b) irregular words, (c) words with letter combinations, and (d) words with advanced phonics features, such as silent letters or *–ed* endings.

mCLASS Intervention also provides specific comprehension information through a comprehension assessment composed of grade-specific passages that students read silently, followed by retelling prompts, literal comprehension questions, and inferential comprehension questions.

# Scope of Lesson Content

### What the Research Says

The National Reading Panel (2000) left open several questions about the kind and length of instruction that Tier 2 and 3 small groups should offer. The panel made recommendations for each of the five components of literacy:

- Phonemic awareness:
  - Give instruction before Grade 2.
  - Give between 5 and 20 hours of instruction.
  - Focus on a few skills instead of trying to cover them all.
  - Link to instruction on letters to increase effectiveness.
- Phonics:
  - Use systematic instruction instead of requiring students to induce letter-sound relationships.
- Fluency:
  - Use oral, guided-reading approaches.
- Comprehension:
  - Based on evidence from Grades 3 and above, use these seven strategies: comprehension monitoring, cooperative learning, graphic and semantic organizers, story structure analysis, question answering, question generation, and summarization.
- Vocabulary:
  - Use explicit and implicit teaching.
  - Find opportunities for vocabulary growth in read-alouds and student independent reading.
  - Structure instruction to give repeated exposure to target words.

Snow and Juel (2005, 513) summarized the effect of these recommendations on curriculum: "Given these fairly nonspecific conclusions from the NRP report, it is not surprising that all the major American publishers of reading curricula found it possible within a few months of the report's appearance to advertise that their products addressed all five 'research-based' instructional domains." However, many specific questions about when, how, and how long to set instruction, particularly in small groups, remained unanswered.

The IES panel report on RTI instruction (Gersten et al., 2009) goes beyond the National Reading Panel report, in part by addressing several important when, how, and how long questions related to the scope of small-group instruction. The IES recommendations include the following:

- Focus on three or fewer skills at a time.
- Schedule instruction to occur three to five times per week.
- Structure instruction to range from 20 to 40 minutes.
- Assign students with homogeneous skill needs to the small group based on the students' scores on universal screening measures.
- Structure small groups to include three to four students.
- Choose an intervention curriculum that is comprehensive enough in scope to provide vocabulary and comprehension lessons that fit students' needs, in addition to phonemic awareness, decoding, and fluency components.

In regard to Tier 3 instruction, the panel was equally adamant about restricting the scope of instruction at any particular time:

> **Focusing on a small set of reading or reading-related skills is essential to Tier 3 in kindergarten through Grade 2 because having too many instructional objectives for struggling readers makes it more difficult to learn the skills well enough for proficient reading. In the opinion of the panel, too many instructional objectives can overwhelm students. Achieving proficiency is also difficult for students when instruction is scattered across different aspects of reading** (Gersten et al., 2009, 26).

### What mCLASS Intervention Does

The mCLASS Intervention grouping algorithm, lesson bank, and lesson plan generators provide teachers with a two-week customized lesson sequence in line with the IES panel recommendations for scope and timing:

- Lessons occur five times per week.
- Each daily lesson takes 20 to 30 minutes.
- Lessons target the needs of students in the group, chosen from a comprehensive lesson bank that covers all five areas of reading (phonemic awareness, phonics, fluency, comprehension, and vocabulary).
- Students are assigned to homogeneous groups based on test results from universal screening measures described earlier.
- Lessons focus on two skill needs at a time for the entire two weeks of the lesson plan to intensify instruction. After two weeks, students are reassessed to determine if the skill focus should change for the next two-week sequence.

When a student's needs relate primarily to decoding, the mCLASS Intervention approach of focusing on two skills at a time also fits with research on learning within a student's zone of proximal development (Vygotsky, 1978). The two skills chosen for each two-week sequence represent an ideal zone of learning, with basic level skills at one end and independent reading skills at the higher end. Working in this zone means that skills will reinforce each other. For example, students in the zone of letter-sound and sounding-out skills will strengthen their sounding-out skills through further instruction in letter-sound skills, and they will strengthen their letter- sound skills, cementing their knowledge of letter-sound relationships by reading real words.

With each two-week lesson sequence, teachers receive explicit information (called Zone Zen) about how the activities focused around one skill (or strand) can strengthen the development of the other skill in that student's learning zone.

## Designing Lessons for Instructional Intensity

### What the Research Says

The IES panel (Gersten et al., 2009) did not recommend any specific programs related to designing lessons for instructional intensity; however, their report offered recommendations about the design of lesson content for intervention groups based on research of educational effectiveness. For small group lessons to reach the highest degree of instructional intensity — that is, to teach the greatest possible amount within the daily time limit of 20 to 30 minutes — it is critical that they incorporate several features, including:

- Material supports, such as graphic organizers, procedural facilitators (for example, color-coded question cards representing questions to ask before, during, and after reading), and concrete manipulatives
- Thinking aloud by the teacher, in all instructional components, to make the thinking process public and explicit
- Frequent opportunities for students to practice the skill
- A systematic structure that builds skills gradually by introducing skills in isolation first, then integrating them with other skills for additional practice and generalization
- Activities that relate to student needs and developmental levels
- The ability to adjust overall lesson pacing as needed (particularly for Tier 3 instruction) so it is slow and deliberate
- Cumulative review of skills covered

Clear, specific, and corrective feedback. The panel discussed the rationale behind this feature, saying:

> A key feature of instructional feedback is error correction. By correcting student errors when they are first made, it is much less likely that errors will become internalized and therefore repeated. For example, if a student incorrectly segmented a word, the teacher could model the accurate response, give the student another opportunity to segment the word, and return to the missed word later in the lesson to reinforce the correct application of the skill. This type of ongoing, guided practice provides students with the support and feedback they need to become fluent with critical reading skills and strategies (Gersten et al., 2009, 28).

The panel also noted the importance of motivational strategies in instruction, recognizing that if motivation is low, instructional intensity will be low. They recommended, for example, that administrators provide teachers with effective motivational strategies and suggested one way to easily engage students by breaking up instructional time into several short activities. Pressley and Fingeret (2007) reviewed the motivational components of effective instruction in even more detail; several of their findings about the features of effective classrooms support the above IES strategies, including:

- Students work on appropriately challenging tasks, neither too easy nor too difficult to accomplish with some effort.
- Much of the teaching is accomplished through teacher scaffolding (Wood, Bruner, & Ross, 1976), which involves the teacher monitoring the progress of individual students and providing assistance as needed to permit students to progress with the tasks.
- Effective teachers provide prompt feedback that indicates what was done well and notes specific ways the student could improve (Pressley & Fingeret, 2007, 233).

Pressley and Fingeret (2007, 233; see also Fink & Samuels, 2008) also stress the importance of taking student interests into consideration, noting, "Effective teachers try to make instruction interesting (e.g., asking students to read books that students find compelling)."

### What mCLASS Intervention Does

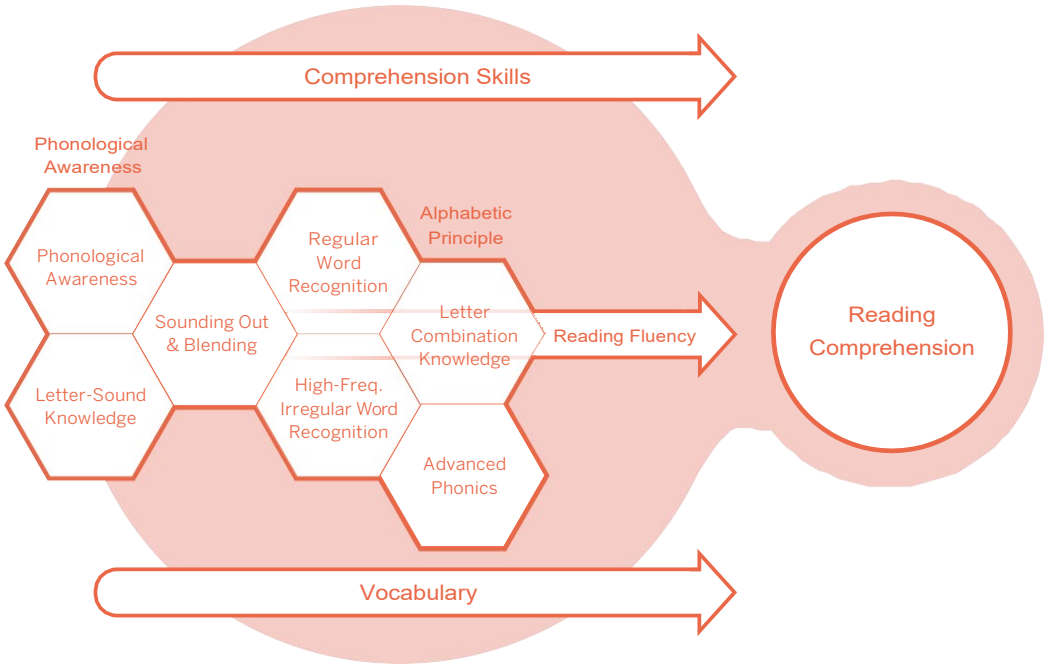
mCLASS Intervention incorporates all of the above features. For example:

- mCLASS Intervention provides extensive material supports, including letter cards, letter- combination cards, picture cards, regular word cards (for VC, CVC, CVCC, CCVC, and CCCVC), irregular words cards, and graphic organizers.
- mCLASS Intervention stresses thinking aloud in every activity, beginning with a teacher-modeling phase.
- Every mCLASS Intervention lesson includes frequent opportunities for students to interact with a practice phase that follows teacher modeling.
- mCLASS Intervention lesson plans build skills gradually by introducing skills in isolation first. For example, students practice letter-sound relationships in isolation, then apply their knowledge to sound out words.

- mCLASS Intervention lesson sequences can adapt to developmental level by adjusting the lesson pace. The lesson generator assembles the lesson sequences by pulling lessons from the lesson bank according to a hot, warm, or cool pace. Students with greatest skill needs, including those at earlier grade levels, move at the slowest, most deliberate pace (the cool pace), with more lessons and more review of material as the skill is learned. Students who already show some mastery of a skill, including students at higher grade levels, move at the fastest pace (the hot pace), with fewer lessons focused on that skill and less review of the material as it is learned.
- Each two-week lesson sequence includes cumulative review activities.
- mCLASS Intervention lessons include scripted examples of clear, specific, and corrective feedback that teachers can use to address student errors as soon as they occur.
- mCLASS Intervention provides teachers with effective motivational strategies through advice in the Burst Briefs resource that accompanies each two-week lesson sequence. For example, a special section titled Interest Ignition includes tips for personalizing the lesson according to students' interests along with ways to link the practice activities to non-mCLASS Intervention instruction (and thus extend the instructional intensity), including but not limited to classroom read-aloud times.
- mCLASS Intervention also keeps motivation levels high by structuring each day's lesson based on several short activities and games, each one lasting no more than five to eight minutes.

## Skill-By-Skill Tour

The following sections describe how mCLASS Intervention lessons incorporate the skill-specific research recommendations for each of the skills in Figure 1. Decoding skills are described first, followed by language comprehension skills.




Whenever decoding skills are described — or taught — apart from comprehension, there is always the risk that this separation implies students will fail to see the purpose for their decoding skills and become word-callers,or readers who pay no attention to meaning. However, the IES panel (Gersten at al., 2009) specifically made the case that having too many instructional objectives at one time can overwhelm struggling readers and suggested that focusing on a smaller set of objectives, such as decoding, is sometimes appropriate:

> For example, the panel believes that if a student is struggling with decoding, it does not make sense to use Tier 3 instructional time for summary writing, comprehension monitoring instruction, or clarification strategies because the primary reading obstacle for the student is sounding out and reading words accurately. Here, decoding is considered a high priority skill because it underlies the student's overall reading difficulty (Gersten et al., 2009, 27).

The panel notes, however, that comprehension and vocabulary are critical skills, and some Tier 3 students may need intensive lessons that focus separately on these areas as well as on decoding:

> For a student receiving Tier 3 instruction, several sessions each week might focus on phonemic awareness and decoding in depth. The other sessions might focus on comprehension and vocabulary in depth. To date, there are not clear-cut empirical guidelines to determine how to balance competing demands for instructional time (Gersten et al., 2009, 27).

Other researchers, such as Catherine Snow, believe that solving time-related dilemmas like this will not come from traditional notions of "balance" but from an approach of integration:

> I personally am not pleased with…balanced reading instruction as leaving open the possibility that you do 20 minutes of phonics and 20 minutes of storybook reading, and that isn't really what we're talking about here. We're talking about integrated reading instruction where the focus on the code and the focus on the meaning are connected to one another, and that's a much harder thing to help teachers figure out how to do (Snow, 2002a, 1–2).

In addition, recent work (Applegate, Applegate, & Modla, 2009) shows that many students fail to integrate code and fluency knowledge with comprehension. In a study of 171 students rated by parents and teachers as strong readers in Grades 2 through 10, one-third of students showed weak comprehension skills despite having high fluency skills:

> LaBerge and Samuels (1974), in their oft-cited description of attentional resources, suggest that automaticity in word recognition frees up an individual's attention for use in comprehension. Our data suggest that for many of the students in our sample, the freed-up resources that result from automaticity and fluency do not necessarily or automatically flow toward comprehension. The fact that we know little about the type of reading instruction these children received is both a limitation of the current study and a challenge to future research. However, it is clear that a significant number of these children have developed a distorted conceptualization of reading, focusing their energies on a high level of word recognition and fluency without also developing high levels of comprehension (Applegate, Applegate, & Modla, 2009, 519).

The authors of the study warn against assessment practices that fail to include comprehension, stating: "What may ultimately be even more detrimental is the establishment of programs of instruction that divorce fluency and word recognition from comprehension" (520). In other words, without instruction that motivates and helps students to use freed processing resources for comprehension, there is no guarantee that students will integrate decoding and comprehension skills to read for meaning.

Clearly, concerns about intensity and integration are valid, suggesting intervention programs' major challenge is promoting integration without compromising intensity. mCLASS Intervention is a leader in finding ways for schools to meet this challenge. Therefore, as part of this skill-by- skill tour, each of the separate sections on skills that fall into the decoding are a will include a subsection entitled Code-Meaning Connection. This subsection will describe mCLASS Intervention's approach to promoting this connection while still giving Tier 2 and 3 students the focus and intensity they need in phonemic awareness, phonics, word recognition, and fluency skills.

# Phonemic Awareness

### What the Research Says

Phonemes are the smallest sounds in a word that can affect the word's meaning. For example, the word "bat" has three phonemes: /b/ /a/ /t/. Students with phonemic awareness can identify and manipulate phonemes in spoken language. Specific phonemic awareness skills include:

- Recognizing individual sounds in words.
  "Tell me the first sound in *paste.*"
  "/p/"
- Blending: listening to a sequence of separate sounds and combining them into a word. "What word is /k/ /l/ /a/ /p/?"
  "clap"
- Segmenting: breaking a word into its sounds
  "How many sounds are in the word *ship?*"
  "Three: /sh/ /i/ /p/"

Phonemic awareness is a subset of a broader set of skills, termed phonological awareness, which covers both phonemic awareness skills and skills with larger chunks of sounds. Examples of phonological awareness skills with those larger chunks include rhyming and syllable skills. Students usually learn to identify rhymes and syllables before they can identify phonemes (National Reading Panel, 2000).

The National Reading Panel reviewed 52 studies on phonemic awareness (PA). Their findings included the following:

- The beneficial effects of PA training on reading lasted well beyond the end of training.
- PA instruction produced positive effects on both word reading and pseudo-word reading, indicating that it helps students remember how to read familiar words and decode words they have never seen before.
- PA instruction helped all types of students improve their reading, including normally developing readers, students at risk for future reading problems, disabled readers, preschoolers, kindergartners, students in Grades 1-6 (most of whom were disabled readers), students across various SES levels, and students learning to read in English as well as in other languages (Grades 2–5).

From these studies, the National Reading Panel also concluded that phonemic awareness instruction is most effective when teachers:

- Focus on one or two skills rather than trying to explicitly teach all of them
- Teach phonemic awareness in conjunction with visual letters (See also Ehri, 2004)

### What mCLASS Intervention Does

When it generates customized lesson sequences for students with PA needs, mCLASS Intervention uses assessment data to determine if students also need to learn how to identify rhymes and syllables first. Students with such needs receive a two-week lesson sequence focused on that need before they are assigned to lesson sequences with phonemic awareness activities. Students ready for a faster pace of instruction immediately begin with lessons at the phonemic awareness level, learning how to segment beginning phonemes (or onsets) from the rest of the word (or rime). Subsequent lessons continue to focus only on two PA skills — blending and segmenting — as students learn to blend and segment all the phonemes in simple words.

For students with the greatest decoding needs, the lesson plan generator creates lesson sequences that initially focus on the two earliest decoding skills needed. This ensures that students with phonemic awareness needs will always learn these skills in conjunction with visual letters. In other words, students assigned to the phonemic awareness strand of lessons in the lesson bank will be assigned to the letter-sound strand at the same time, even if these students also lag behind in language comprehension. In addition, many of the phonemic awareness games and activities use letter cards as manipulatives to further scaffold students' skills.

### Code-Meaning Connection

The Burst Briefs that accompany lesson sequences with a phonemic awareness strand provide teachers with examples of how to help students connect and apply their phonemic awareness skills to read-alouds of high-interest books outside of mCLASS Intervention time. For example, the Burst Bag that each teacher receives includes a pop-up book, *The Jungle Book* (Reinhart, 2006). Teachers can incorporate what children learn in the PA activities using examples such as the following:

> Who knows what a cobra is? Well, it's a snake that looks like it's got a big hood around its neck, and it is very, very poisonous. You definitely don't want to get bitten by a cobra. In our story today, we'll get to see a new, big, pop-up book, and one of the characters is a special cobra. One thing that makes him special is his color. What color do you think he is? Well, listen to the sounds that I say and see if you can put them together to guess his color. [Say the three sounds in /white/.] Do you know what color that is? You might be right, but I'm not going to tell you yet! Let's do our other Burst activities, practice blending together other sounds into words, and then later we'll read our book and see if you're right about that cobra.

# Systematic Phonics (Letter-Sound, Letter-Combination, Sounding Out and Blending, and Advanced Phonics)

## What the Research Says

The components of systematic phonics instruction have often been at the forefront of debates about reading. Letter-Sound instruction refers to lessons about the sounds associated with single letters, and Letter-Combination instruction refers to lessons about the sounds associated with letter combinations such as consonant digraphs (e.g., *sh*) and vowel digraphs (e.g., *oa*). Sounding Out and Blending instruction refers to instruction about how to map sounds onto the letters in a printed word and then blend the sounds together. Advanced Phonics instruction refers to instruction on such features as plurals and *–ed* endings.

Most phonics programs teach all of these skills explicitly and systematically. For example, these programs use a specific sequence to teach the letters and sounds, and the lessons' structure ensures lots of practice with each letter and its sound. Systematic phonics programs also typically teach just one sound for each letter early on. In teaching the letter combinations, systematic phonics programs are also more comprehensive than other programs. In addition, students in effective systematic phonics programs typically practice their knowledge of letter sounds and letter combinations by reading decodable texts comprised of words that allow students to immediately put their knowledge to use (Gunn et al., 2000; Jenkins et al., 2004; Vadasy, Sanders, & Peyton, 2005).

Basal programs may have a scope and sequence for teaching some letters and sounds, but they are less likely to teach a letter to one specific sound. For example, a basal program may use all of these words to teach the letter "o": *orange*, *of*, *on*, *once*, *open*, *off*, *out* (Foorman, Breier, & Fletcher, 2003). Basal programs may or may not use decodable texts for reading practice. Whole-language instruction, on the other hand, does not use a predetermined sequence. Teachers teach a particular letter-sound combination when it is needed for what students want to read or write. Decodable texts are not used. Instead, students practice reading authentic, real-world material, such as signs, messages, or trade books.

The National Reading Panel (2000) reviewed 38 studies related to the following questions:

- Does systematic phonics instruction help students learn to read more effectively than other types of instruction (such as basal, whole-language, and whole-word instruction)?
- Does this instruction benefit a wide range of students, including those learning to read with difficulty and those who risk developing reading problems in the future? The combined evidence clearly showed that systematic phonics programs help students learn to read more effectively than other programs. The panel concluded that when students learn letter-sound and letter-combination correspondences systematically, their reading growth is greater than in programs that do not use systematic phonics lessons.

Similarly, the IES panel (Gersten et al., 2009) recommended Tier 2 and Tier 3 instruction include systemic phonics instruction:

> … a systematic curriculum might begin by introducing a few of the most frequently used consonants sounds (*m*, *s*, *t*, *b*) followed by a vowel, usually the short *a*. This allows students to integrate these newly learned sounds by blending sounds into words (Gersten et al., 2009, 22).

The panel also recommended RTI curricula include instruction on letter combinations and advanced phonics features, such as:

> … digraphs (*oa* as in *boat* and *ch* as in *child*), diphthongs (*ew* as in *stew*, *oi* as in *soil*), and controlled *r* (*ar* as in *car*, *ur* as in *fur*). These interventions address structural analysis skills that focus on prefixes, suffixes, forming plurals, and adding *–ed* and *–ing* to form past and progressive tenses (Gersten et al., 2009, 21).

Research from the field of neuroscience also supports this approach (Harm & Seidenberg, 1999; Wolf, 2007). Evidence increasingly suggests that each time a reader sees and decodes a particular word, paying close attention to the printed letters (also known as the word's orthography) strengthens the neural connections for that word. When the connections are strong enough, the brain can automatically recognize the word, and the reader no longer has to decode it. Therefore, instructional practices that encourage students to look at only a few letters in a word and then guess its identification from pictures or context are not as effective at helping the brain recognize words as focusing students' attention on all the letters in a new word, as well as the match between the letters and the sounds (Hempenstall, 2004). One group of researchers put it this way:

> In other words, phonics instruction may simply point children in the direction of looking deeply into the printed form of the word as they attach sound to it, rather than looking for clues outside the printed word. Indeed, each time the child skips over scrutinizing the internal structure of a printed word in favor of using contextual cues or illustrations to identify the word, the child loses an opportunity to imprint the orthography (Snow & Juel, 2007, 516).

### What mCLASS Intervention Does

The mCLASS Intervention lesson bank systematically and comprehensively covers letter-sound instruction, sounding-out and blending instruction, letter-combination instruction, and advanced phonics instruction. As the IES panel suggests, the lesson sequence begins by introducing a few of the most frequently used consonant sounds (a, m, s, t) and one vowel (Carnine et al., 2004). The lessons also teach just one sound for each letter early on.

In the sounding-out and blending lessons, which often accompany the letter-sound lesson strand, students integrate learned sounds by blending sounds into words. If a student simultaneously learns letter sounds and sounding out, the sounding out and blending lessons only use letter sounds the student already learned; this is a key feature of mCLASS Intervention's structure.

The late-decoding inventory in mCLASS Intervention assessment can detect whether students who mastered letter-sound knowledge and sounding-out and blending knowledge still need additional decoding instruction and whether they need it on letter-combination knowledge or advanced phonics features. Students who continue to show decoding needs will be assigned to those two strands of lessons. Letter-combination instruction systematically and comprehensively covers digraphs, diphthongs, and controlled *r* words. Advanced phonics lessons systematically cover plurals, *–ed* and *–ing* endings, as well as contractions, compound words, double-letter and silent-letter words, and word families.

The sequence that mCLASS Intervention uses for teaching particular letter sounds, letter combinations, and advanced phonics features is fixed, with an adjustable pace based on student abilities. This means the particular phonics elements taught during mCLASS Intervention time may or may not align to the core reading lessons for that day. This sometimes causes teachers concern. However, the IES panel states that such concern is unnecessary, because, in their words, "alignment is not as critical as ensuring that instruction is systematic and explicit and focuses on the high priority reading components" (Gersten et al , 2009, 23).

### Code-Meaning Connection

To strengthen the code-meaning connection, the mCLASS Intervention assessment and algorithm system ensures students who get letter-combination and advanced phonics instruction already learned some of the critical, high-frequency words necessary for reading meaningful text, such as *the*. As a result, students can practice their letter-combination and advanced phonics knowledge in contexts that invite comprehension. These special contexts involve decodable text, but they bypass common criticisms of decodable text (Quinn, 2007) by opting for types of text that can retain high meaning even in short, decodable chunks.

For example, many decodable text programs use stories some criticize as "impoverished," such as "*The cat sat on the mat.*" They are considered impoverished because real-world stories use text that is longer and richer than those in decodable books. Rather than using such stories, mCLASS Intervention decodable text lessons include highly motivating chunks of text that are naturally short yet meaningful: riddles, clues or, instructions for games, and jokes. For example, decodable text for students practicing the *wh*, *sh*, *ea*, and *ch* combinations includes the following riddle: "What fish is not cheap?"

Students work in a group to decode the text and guess the answer: *a goldfish!*

Contexts like these, which invite and motivate comprehension — with short and decodable text that is perfectly natural for its purpose — set mCLASS Intervention apart from many other phonics programs that offer students decodable text only in the context of unnatural stories with limited appeal and virtually no purpose. mCLASS Intervention texts allow students to read for meaning while still applying their knowledge of letters and sounds, always looking deeply into the printed form of words, and never skipping over or guessing words with unfamiliar phonics features.

What about students not yet ready to practice their phonics knowledge with decodable text? For students first learning basic letters and sounds, mCLASS Intervention still offers a code-meaning connection through the Burst Briefs that accompany each lesson plan. As illustrated in the earlier section on phonemic awareness, the Burst Briefs offer advice and scripted models for integrating phonics into meaningful contexts in the non-mCLASS Intervention activities such as read-alouds.

# Word Recognition (Regular and High-Frequency Irregular Word Recognition)

### What the Research Says

Leading researchers in reading (Perfetti, 1992; Rayner et al., 2001) now believe that every word a student learns goes through a shift from being a word the student cannot instantly recognize to one the student recognizes by sight. The shift happens after practicing that particular word enough that the brain automatically recognizes it. Looking deeply at the letters in words and linking them to sounds facilitates this automatic recognition. The student's growth as a reader involves — in part — building an ever-larger mental dictionary of sight words: words that he or she can automatically recognize after multiple exposures.

Students who learned how to decode basic words, such as *cat*, can begin to build this mental dictionary of sight words as they read and encounter both new and familiar words multiple times. However, students at this stage of reading will likely encounter several types of difficult words as well. One type are words that use letter combinations, such as *her*. Advanced readers who learned the *–er* pattern would not find this word difficult, but beginning readers might fail to identify it.

A second type of difficult word uses an unusual letter-sound correspondence — one that beginning readers may have never seen before. An example is the word is. Beginning readers may not know that we sometimes say the sound /z/ for the letter *s*, so they could be stumped. When it comes to vowels, many beginning readers only know the short-vowel sounds. So a word like *he* could also confuse a beginning reader.

A third type of difficult word is challenging for both of the earlier reasons. The classic example is *the*, which uses both a letter combination *th* and an unusual sound for the letter *e*.

Finally, a few words are highly irregular, such that letter-sound mapping is of little help. Examples include *eye* and *one*.

Researchers also identified the words found most frequently in material written in English. These words are critically important for beginning readers to learn to recognize automatically (Hiebert & Fisher, 2002; Zeno et al., 1995). Other scientists use computer models to simulate students word-recognition learning — as well as their difficulties in word learning — using models in which all words

are taught in a similar way: by thinking first about how the sounds map onto the word's letters (Harm & Seidenberg, 1999).

Further, many researchers strongly believe that when students ignore the way letters match to sounds, they miss an opportunity to focus attention on the word in the way that helps the brain remember and later recognize the word (Snow & Juel, 2005). As a result, students' best path toward word recognition for all words appears to focus on the word's orthography when the word is unfamiliar and then practice reading the word repeatedly in multiple contexts to build familiarity and automaticity (Perfetti, 1992; Rayner et al., 2001; Share & Stanovich 1995). This path is contrary to some instructional practices for sight words, in which students are told to ignore the particular letters in some words and just memorize the word as a whole or guess its identification from context. However, recent neuroscience and brain imaging work suggests that the first 100 to 200 milliseconds of word recognition consists of mapping the word's letters to sounds, thus supporting the recommendation to focus students' attention on the role that letters and sounds play inside every word when the word is unfamiliar (Wolf, 2007).

### What mCLASS Intervention Does

The mCLASS Intervention lesson bank includes explicit and comprehensive lessons that teach beginning readers to recognize the words they need most for success with connected text: frequent words that are difficult to identify first on their own, including frequent words with letter combinations (e.g., *her*), frequent words with unusual letter-sound correspondences (e.g., *is*), and frequent words with both letter combinations and unusual letter-sound correspondences (e.g., *the*). These words map closely onto common instructional word lists, such as Dolch words.

Following the general recommendations by the IES panel (Gersten et al., 2009), words are first introduced in isolation. The mCLASS Intervention lessons on word recognition also follow the recommended pathway to automatic recognition of these words: focusing students' attention explicitly on the role of letters and sounds when the word is unfamiliar, then giving students opportunities to practice reading the word multiple times in multiple contexts to build familiarity and automaticity.

### Code-Meaning Connection

As described for the phonics features, students practice their word recognition skills in contexts that invite and motivate comprehension — with short, decodable text that is perfectly natural for its purpose. New words are introduced and practiced prior to these contexts. The contexts are used for multiple exposures, leading to familiarity and automaticity. For example, students first learn and practice the frequent words *her* and *to* in isolation on a white board, then practice them in a Simon Says game with decodable instructions such as "Hand a pen to her." In this kind of connected text, with a focus on natural, fluent reading, students can build recognition of both regular and irregular words.

# Fluency

### What the Research Says

The relationship between fluency and word recognition skills is intimate. Recent research suggests that for readers in Grades 1 through 3, a student's level of fluency — as measured by accuracy and pace — is determined almost exclusively by his or her sight-word skills (Schwanenflugel et al., 2006). In other words, the more words students can recognize automatically, the better their fluency.

Of course, readers must also know how to interpret punctuation in order to read with proper expression, and many researchers define fluency by more than accuracy and pace alone (Applegate, Applegate, & Modla, 2009). Many researchers also believe that as students get older, and as the texts they read get more complex, comprehension-related skills increasingly affect fluency: skills that use knowledge about how words and phrases in sentences relate based on their meanings (National Reading Panel, 2000).

Motivation also plays an important role in the relationship between fluency and comprehension for any particular text. If students are bored with the content of a text, they may read it quickly without paying attention to what it means. Likewise, readers with weak word-reading skills can still understand a text they are highly motivated to read if they use such strategies as rereading, looking back, or even reading aloud to minimize distractions (Walczyk & Griffith-Ross, 2007).

Lack of background knowledge (including vocabulary knowledge) can also impede comprehension for fluent readers. If students read about a totally unfamiliar situation, they may read the words, but without making the kind of inferences needed for good comprehension. On the other hand, students with a lot of background knowledge and vocabulary about a topic (such as outer space) use their knowledge to figure out words they find difficult to decode. This knowledge may also help them make inferences and comprehend well, even though their reading is slow and effortful. For its 2000 report, the National Reading Panel found 16 studies, conducted from 1970 to 1996, that used experimental-control group designs for testing the effectiveness of repeated oral reading practices on the development of fluency. The students in these studies ranged from Grade 2 through Grade 9. The evidence from these studies convinced the panel that these procedures helped improve students' reading ability from Grade 2 through at least Grade 5, and they helped improve the reading skills of students with learning problems much later still. Although the National Reading Panel did not specifically look at fluency interventions in Grade 1, the IES panel (Gersten et al., 2009) recommended using oral fluency measures to monitor progress in Grades 1 and 2. Further, the IES panel recommended fluency interventions for Tier 2 instruction while noting that "fluency interventions

are a promising practice, as opposed to a clear, evidence-based practice for Tier 2 interventions at this point in time" (44).

Notably, fluency instruction engages students about reading connected text rather than isolated word lists. Recent work with Grade 1 students labeled as "most at-risk" suggests this feature makes fluency intervention an important part of Tier 2 and 3 work, even in Grade 1. Harn, Linan-Thompson, and Roberts (2008) examined intensive instructional supports in Grade 1 within small-group instruction. Their initial intervention content (November through January) focused 58 percent of the time on word analysis (phonics and word recognition),17 percent on fluency (with letter names, sounds, and beginning word reading), and 25 percent on passage reading and comprehension. However, the researchers became discouraged with this approach, noting a lack of progress about halfway through the year. They then created a shifted intervention. The shifted intervention (February through June) spent 25 percent of the time on word analysis and 75 percent of the time with connected text (fluency practice, passage reading, and comprehension). In contrast to the word-level fluency practice used in the beginning of the year, the researchers noted, "With the revised materials, much more time was spent developing students' skills in reading connected text with accuracy and pace" (120).

Harn et al. (2008) worked with students in a 60-minute daily intervention, not a 30-minute session more typical of Tier 2 interventions. However, Harn and colleagues clearly believed it is critical to make and better understand this kind of shift for Grade 1 interventions of shorter duration. They stated in their conclusions:

> **This change in the amount of time spent on different components (increased time on fluency and comprehension and decreased time on word analysis) may be more influential than the difference in total time allocation** (Harn et al. 2008, 123).

The effective fluency interventions studied by the National Reading Panel generally had the following key features in addition to use of connected text:

- Students read and reread a text multiple times.
- Students received more practice reading aloud — compared to the amount they get in traditional whole-group, "round-robin" instruction — through one-on-one instruction, tutors, audiotapes, peer guidance, computer-based voice recognition software, or other means.

In addition, some programs (called "guided repeated oral reading") gave teachers carefully designed feedback routines to use in guiding the reader's performance.

Additional research (Hiebert & Fisher, 2002) suggests the structure of the texts students read in fluency interventions is also important. In a study with students in Grades 2 through 4, students who practiced repeated readings with specially engineered texts — texts constructed so that 90 percent of the words fell within the Grade 3 curriculum — performed better on standardized fluency tests than students in a comparison group with traditional curricula. In the engineered texts, 78 percent of the words fell within the 1,000 most frequent words and over 20 percent of the other words were decodable. The text repeats words that are neither highly frequent nor decodable at least four times.

During the past year, criticisms of the Reading First program, and its demonstrated lack of impact on comprehension skills, centered on fluency issues (Gamse et al., 2008). Critics charge that too many teachers in Reading First classrooms fail to stress that the purpose of reading is comprehension, not speed (Pressley & Fingeret, 2007; see also http://www.elladvocates.org/media/NCLB/EdWeek9mar07.html). Clearly, Tier 2 and 3 fluency interventions must find ways to help teachers continually remind students that the purpose of reading fluently is to better understand what they read.

Fluency was also one of the areas for which the IES panel (Gersten et al., 2009) provided specific recommendations about what should happen during the day for Tier 2 and 3 students not in small-group or one-on-one instruction. The panel noted that for all students:

> … independent silent reading activities should be gradually increased as reading skills improve. Data on student performance (as a measure of word identification fluency or fluency in reading connected text) should inform this decision. For many Grade 1 students, independent silent reading time would be minimal during the first few months of the year (Gersten et al., 2009, 18).

### What mCLASS Intervention Does

mCLASS Intervention offers up to 12 weeks of fluency lessons during Grades 1, 2, and 3 for students with low scores on the DIBELS Oral Reading Fluency (ORF) measure. Students only take fluency lessons after the assessments and progress monitoring measures reveal that fluency problems are not attributable to phonics or word recognition skill needs.

The fluency lessons include explicit teacher modeling about what fluency is and why it is important. Scripted examples help teachers continually remind students that fluency is more than accuracy and pace alone, that it involves reading with proper expression, and that the purpose of fluency is to read and understand more.

mCLASS Intervention fluency lessons engage students around reading connected text specially designed to provide intensive instruction. Passages include both fiction and nonfiction, but they are written so 90 percent of words fall in grade-appropriate levels defined by word frequency and decodability. The remaining 10 percent of words repeat throughout the texts. Texts are written so most students can initially read the entire text in two to three minutes after hearing the teacher read it aloud twice.

Students read and reread each text at least four times, working to increase their ability to read the passage, with an emphasis on prosody (rhythm, stress, and intonation), not just accuracy and time. Lessons also include strategies for identifying words that are more difficult than those from the advanced phonics lessons, using prefixes, suffixes, and breaking down the word into smaller parts.

mCLASS Intervention also provides teachers with the fluency progress monitoring measures they need to make decisions about gradually increasing students' independent silent reading time outside of Tier 2 and 3 small groups. In addition, the Burst Briefs that accompany lessons provide specific tips on how to select texts for independent reading time in line with students' interests to maximize engagement.

### Code-Meaning Connection

mCLASS Intervention fluency lessons take seriously researchers' suggestion that "reading instruction connected to content matters" (Pressley & Fingeret, 2007, 232). All mCLASS Intervention passages are written with a goal of building motivation and background knowledge by being about something real and interesting, aligned to state standards for science and social studies content. Lessons for each passage include literal and inferential comprehension questions to further focus attention on meaning. Each grade level includes multiple content themes, including Our Five Senses (Grade 1), Insects (Grade 2), Human Body (Grade 2), Rain Forests (Grade 3), Coral Reefs (Grade 3), and Astronomy (Grade 3). To further help students build text-to-text connections, recurring characters also appear throughout the texts and develop according to a continuing character arc.

# Vocabulary

### What the Research Says

The National Reading Panel (2000) concluded that, to most effectively teach vocabulary, teachers should use a variety of methods, including:

- Direct instruction that gives definitions or other attributes of words
- Repeated and multiple exposures to a word in many contexts
- Active engagement

As for which words to teach, researchers' opinions differ, but a review of the literature suggests that teachers should consider a student's age and level of need and the type of instruction (small-group or whole-class).

For older students, particularly those approaching middle-school level, some researchers advocate using academic words. Words like *infer*, *deny*, *prove*, and *factor* are critical for understanding texts and thinking processes in different disciplines. (See http://www.wordgeneration.org/snow.html.)

For younger students, many researchers suggest that for general, whole-class instruction, teachers pull words from grade-appropriate read-aloud books (Beck, McKeown, & Kucan, 2002). The words from these books fall into three tiers (not with the tiers referred to in RTI):

> Tier One: Words are words that students already know. They occur frequently in everyday speaking.
>
> Tier Two: Words are not as common in everyday talk but are relatively frequent in children's books. Examples from kindergarten read-alouds are words like *disappear* and *foolish*. Grade 1 Tier Two words include *clutching* and *announce*. Researchers advocate using Tier Two words like these for vocabulary lessons in this type of general instruction (Beck, McKeown, & Kucan, 2002).
>
> Tier Three: Words are less common across read-alouds — words such as *peninsula*. Researchers suggest these words better suit learning in content areas (Beck, McKeown, & Kucan, 2002).

Other researchers report that students who struggle with vocabulary, particularly those from other language backgrounds, often do not know common words in early reading instruction, such as *hog* and *thorn* (Juel & Deffes, 2004). This research suggests teachers should use these common words (similar to those labeled Tier One above) in their small-group RTI instruction with students who show those vocabulary needs. Students who know a printed word in their oral vocabulary can more easily and quickly sound it out and read it in their texts (Lehr, Osborn, & Hiebert, 2004), so instruction in these words will prevent students from derailing in their decoding lessons and independent reading.

With regard to intensity guidelines for this instruction, researchers suggest students in kindergarten and Grade 2 can learn and retain at least two word meanings a day (Biemiller, 2003, 2004; Elley, 1989; Senechal, 1997; Senechal, Thomas, & Monker, 1995).

### What mCLASS Intervention Does

mCLASS Intervention lessons offer small-group, intensive instruction in vocabulary with a focus on common words that may derail decoding lessons and independent reading. Following the intensity guidelines from research, these lessons teach an average of two word meanings a day in kindergarten and Grade 1, with repeated and multiple exposures to words across the days of a two-week lesson sequence. In Grades 2 and 3, the lessons teach an average of four word meanings a day, with the increase due to the likely overlap between some of the word selections and the students' listening vocabularies.

mCLASS Intervention lessons explicitly and directly teach definitions and attributes of target words. These words are selected from grade-level lists of frequent words (Zeno et al., 1995). Target words come from those that occur between the top 300 and top 600 most common words for a grade level. In an initial lesson for a target word, teachers use scripted examples like the one below to introduce definitions and begin to give multiple and repeated contexts:

- Today we will learn some words. The first word is *bump.* There is a *bump* when two things knock into each other. If two cars hit each other, they "bump." If I run into you, we may hear a bump. What's the word?
- I'm going to name some activities. If you think that there's a bump when these activities happen, say *bump*. Otherwise, stay quiet.

- My turn first. Sleeping in bed.I will keep quiet because there will not be a bump when I am sleeping in bed.
- Falling down. I will say *bump* because when I fall down, my knees bump into the ground.

Later lessons give more contexts and attributes using graphic organizers (word webs) and five-senses activities through which students explore and deepen their full understanding of a word's meaning. Each of these activities is designed for active engagement, with a preliminary teacher-modeling section followed by a student practice session. Additional repeated practice for target words occurs through matching activities (matching words to their definitions) and sentence-production activities, as well as vocabulary games.

# Comprehension Strategies

### What the Research Says

Comprehension strategies are mental procedures that students can use on their own as they read to improve their understanding. The National Reading Panel (2000) recommended instruction in comprehension strategies, including the use of graphic organizers and multiple-strategy instruction, although the panel noted the limited research on this instruction in Grades K–2. Other researchers emphasize that decoding and fluency can act as roadblocks to comprehension; students need a basic level of fluency before using comprehension strategies with written text:

> We know from research done over the past two decades that accurate and fluent (automatic) word recognition is associated with adequate reading comprehension. We also know that language comprehension processes and higher-level processes affecting language comprehension (the application of world knowledge, reasoning, etc.) do not become fully operative in comprehending text until the child has acquired reasonable fluency (Snow, 2002b, 22).

In the years since the National Reading Panel's report, researchers (Block & Lacina, 2009; Pearson & Duke 2002; Snow, 2002b) agree that more studies with younger students are needed, but they advocate that teachers not wait for additional research before integrating some level of comprehension strategy instruction into their K–2 classrooms:

> It may be that some strategies — perhaps relating text to prior experiences or making predictions about text content — are so foundational that they should be emphasized a great deal very early in schooling. It may be that other strategies, such as summarizing, are so difficult for young learners that they should be either backgrounded or given more intensive instruction in primary-grade education.
>
> Unfortunately, presently available research does little to suggest priorities for different comprehension strategies or for the particular challenges young learners may face in learning them…These significant shortcomings notwithstanding, we know enough about what to teach and how to teach comprehension to our very youngest readers to make a good start at doing so. To delay this sort of powerful instruction until children have reached the intermediate grades is to deny them the very experiences

> that help them develop the most important of reading dispositions — the expectation that they should and can understand each and every text they read (Pearson & Duke, 2002, 257).

In a similar vein, the IES panel on RTI (Gersten et al., 2009, 20) recently concluded that "literal comprehension and some rudimentary comprehension instruction occur in many of the successful interventions, and so are recommended" for Tier 2 and 3 settings. The panel was less certain about recommending inferential comprehension, primarily due to concerns that Tier 2 and 3 curricula might become watered down, lacking sufficient intensity due to the inclusion of too many skills. Other research shows that a lack of inferential comprehension skills could interfere with comprehension (McNamara, Miller, & Bransford, 1991; Weaver & Kintsch, 1991; Yuill & Oakhill, 1988). Thus, finding a way to support inferential comprehension without compromising Tier 2 and 3 intensity remains a challenge.

Recent research also points to new and effective features for intensive and effective comprehension instruction in early grades. For example, multiple-strategy instruction can be effective with students in Grades K–2, if students are taught hand motions that help them identify when and where to use a particular strategy. Hand motions are thought to provide a second (kinesthetic) pathway that helps young students use dual coding (Paivio, 1991) to understand and remember abstract strategies. These hand motions also appeared to trigger students' use of strategies and show significant benefits for students' immediate and long-term comprehension growth (Block, Parris, & Whiteley, 2008).

Research also suggests that comprehension instruction in the early grades should include both fiction and nonfiction texts (Duke & Bennett-Armistead, 2003). Although the research on graphic organizers reviewed by the National Reading Panel was primarily with older students, researchers working in K–2 classrooms suggest that their use with younger students similarly helps make effective thinking about text visible (Duke & Bennett-Armistead, 2003). Other examples of genre-specific comprehension-strategy outcomes for story and informational texts include:

- Stories: Understanding story elements, sequencing events, retelling, finding the underlying message
- Informational texts: Understanding visual and textual elements, knowledge of text structure, and summarization (Keene, 2008)

Finally, research emphasizes the importance of scaffolding (Bruner, 1983). Scaffolds enable beginning readers to focus on the meanings of texts that are too complicated for them to initially read and understand on their own. When teachers use scaffolds effectively, they:

- Interest the student in the task
- Reduce the cognitive load or the number of steps required
- Maintain pursuit of the goal
- Identify discrepancies between what a student produced and the ideal solution
- Control frustration and risk
- Demonstrate an idealized version of the act to perform (Bransford, Brown, & Cocking, 2000, 104)

The most effective use of scaffolds involves a "gradual release of responsibility" model, where teachers heavily scaffold initial activities and then gradually remove scaffolds so students take over a greater role in the instructional activities (Pearson & Gallagher, 1983). Examples of scaffolds for comprehension include providing pictures to accompany text (Glenberg & Langston, 1992), reading text aloud (Calkins, 2001), and moving from single-strategy to multiple-strategy instruction (Pressley et al., 1992).

Importantly, researchers emphasize that comprehension-strategy instruction is more than administering sets of comprehension questions. Testing comprehension is not teaching comprehension. Instead, effective comprehension-strategy instruction uses extensive modeling, where teachers make their own comprehension processes extremely explicit, using think-alouds about how they find answers to questions, how they select strategies to clarify understanding, and how they connect the text to their own experiences (Block & Israel, 2004; Oster, 2001; Keene & Zimmerman, 1997).

### What mCLASS Intervention does

Drawing from this research base, the mCLASS Intervention lesson bank includes 12 weeks of intensive comprehension-strategy lessons at each grade level for children in Grades 1–3. Instruction at each grade level spirals through the same foundational strategies, using texts of appropriate level for that grade. In keeping with the goal of research-based, intense instruction, the mCLASS Intervention lessons on comprehension strategies:

- Focus on key strategies. The strategies in the lesson bank were chosen from the National Reading Panel report, combined with information from state standards and interviews with teachers about strategies that are particularly problematic for struggling readers.
- Address concerns about intensity. Comprehension-strategy lessons do not detract from the intensity of skill instruction on other foundational components. Students are not assigned to comprehension strategy lessons until they show mastery of foundational decoding skills and reach a basic level of fluency. This does not imply that these students should receive no comprehension instruction until they can decode, simply that their small-group intensive instruction needs to focus first on clearing early decoding and fluency roadblocks to comprehension. As described in earlier sections, mCLASS Intervention provides materials to help teachers link even the earliest code instruction to meaning.
- Make thinking explicit and visible. Every mCLASS Intervention lesson includes a modeling phase during which teachers use think-alouds and modeling to reveal explicitly how and when to use a particular strategy. Students in the most extensive set of comprehension lessons are also shown how to connect the text, themselves, and the world. mCLASS Intervention also assigns many of the strategies unique hand motions to make each strategy further visible to both teacher and student. Finally, every mCLASS Intervention strategy receives a unique graphic organizer to help students remember and visibly practice strategy use.
- Use scaffolds, with a gradual release of responsibility to students. All initial lessons on a strategy focus entirely on stories told through pictures. Text is added gradually, and students practice strategies with picture-supported text until they can practice the strategy with stories told through text alone. Similarly, teachers usually begin strategy lessons by reading text aloud to students. As a particular strategy is practiced, students gradually move toward using the strategy with text they read independently. Finally, as the lessons progress, students move from using single strategies to using multiple strategies to comprehend a text.

- **Emphasize self-initiation of strategies.** Teaching students hand motions is only one way that mCLASS Intervention lessons seek to trigger students' independent strategy use. For example, after students move through fiction and nonfiction lessons, they receive explicit mCLASS Intervention lessons that deepen their knowledge of which strategies to use for fiction vs. nonfiction texts, and how to select strategies for different purposes.

## Concluding Remarks

Ample evidence from research shows no single instructional pathway is optimally effective for all students to advance their reading growth (Connor, Morrison & Katch, 2004; Connor et al., 2007; Juel & Minden-Cupp, 2000; Valencia & Buly, 2005). One-size-fits-all instruction does not work, but neither will typical three-sizes-fit-all programs that only customize instruction for three levels of readers ("high," "medium" and "low"). Under such limited "differentiated" systems, students with high- and medium-level skills will likely find ways to successfully read at grade level, but students with low skill levels will not. They need more. Their skill needs are so great that unless instruction is maximally effective, we are unlikely to ever attain the ultimate goal of helping all students "be able to read books with enjoyment while lying in a hammock under elm trees" (Snow, 2007).

Fortunately, comprehensive intervention systems like RTI, combined with the mCLASS Intervention program, may help more low-skill level students into these hammocks than ever before. mCLASS Intervention fits all sizes, complete with an assessment system, grouping algorithm, and lesson bank to match students with research-based instructional experiences that best fit their needs. The RTI approach provides the contextual intensity that students need through its system of assessment-driven, homogeneous, small-group instruction. mCLASS Intervention offers the tools for creating those groups, and then takes intensity one step (or more accurately, one leap) further by offering customized, research-based lessons that maximize the instructional intensity of what happens in those small groups, based on students' needs. mCLASS Intervention honors the individuality of students and pushes the whole notion of curriculum toward new levels of recognizing the value of each student's personal learning experience.

Given that we are in an era when quantitative views of reading growth are highly valued, it makes sense to develop a description of effective reading comprehension instruction in mathematical terms. The scientifically demonstrated gaps in skill needs when students enter school, along with the need to customize instruction to those needs, suggest a valid equation for the effectiveness of reading instruction is as follows:

Effectiveness = Intensity × Fit.

Reading-comprehension instruction derives its effectiveness from intensity of instruction and how well instruction matches student need.

If either of the components on the right side of the equation is low — for any reason — the effectiveness of reading comprehension instruction will be low, and the ultimate reading achievement of our lowest-skilled students will remain low. For example:

- If a program's individual lessons are effective but they require more instructional time than is possible to bring our lowest-skilled students up to grade level, they will lack sufficient intensity, reduce the total effectiveness of instruction, and fail some students.
- If a program's activities are not motivating enough for our lowest-skilled students, they will lack sufficient instructional intensity, reduce the total effectiveness of instruction, and fail some students.
- If the matching fit between what students need and their activities is not accurate enough, this will reduce the effectiveness of instruction and fail some students. Students would sometimes spend instructional time on what they need and other times they would not — and there simply is not enough time for that to happen and for our lowest-skilled students to still get enough instructional time on the skills they need.

To achieve sufficient levels of both intensity and fit, we need to bring in all the resources of research and all the powers of technology at our disposal. mCLASS Intervention represents the first major advance in doing just that.

* A nonillion, represented by the number one followed by 30 zeros, reflects the number of 20-week instructional sequences mCLASS Intervention is capable of generating to align with a student's evolving skill needs.

# References


Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Applegate, M., Applegate, A. J., & Modla, V. B. (2009). "She's My Best Reader; She Just Can't Comprehend": Studying the relationship between fluency and comprehension. *The Reading Teacher*, 62(6), 512–521.

Beck, I., McKeown, M. G., & Kucan, L. (2002). Bringing words to life: Robust vocabulary instruction. New York: Guilford.

Biemiller, A. (2003, April). Teaching vocabulary to kindergarten to Grade 2 children. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Biemiller, A. (2004). Teaching vocabulary in the primary grades: Vocabulary instruction needed. In Baufman, J. F., & Kame'enui, K. (Eds.), *Vocabulary Instruction: Research to Practice*. New York: Guilford.

Block, C. C., & Israel, S. E. (2004). The ABCs of performing highly effective think-alouds. The Reading Teacher, 58 (2), 154-167.

Block, C. C., & Lacina, J. (2009). Comprehension instruction in kindergarten through Grade 3. In S. E. Israel & G. G. Duffy (Eds.), Handbook of Research on Reading Comprehension. New York: Routledge.

Block, C. C., Parris, S. R., & Whiteley, C. S. (2008). CPMs: A kinesthetic comprehension strategy. *The Reading Teacher*, 61 (6), 460-470.

Bransford, J., Brown, A., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press.

Bruner, J. S. (1983). *Child's talk: Learning to use language*. New York: Norton.

Calkins, L. (2001). *The art of teaching reading*. New York: Longman.

Carnine, D. W., Silbert, J., Kamen'eui, E. J., & Tarver, S. G. (2004). Direct instruction reading (4th ed.). Upper Saddle River, NJ: Pearson.

Connor, C. M., Morrison, F. J., Fishman, B. J. Schatschneider, C., & Underwood, P. (2007). Algorithm-guided individualized reading instruction. *Science*, 315(5811), 464-465.

Connor, C. M., Morrison, F. J., & Katch, E. L. (2004). Beyond the reading wars: The effect of classroom instruction by child interactions on early reading. *Scientific Studies of Reading*, 8(4), 305-336.

Duke, N. K. & Bennett-Armistead, V. S. (2003). *Reading and writing informational text in the primary grades: Research-based practices*. New York: Scholastic.

Ehri, L. C. (2004). Teaching phonemic awareness and phonics: An explanation of the National Reading Panel meta-analyses. In P. McCardle & V. Chhabra, (Eds.), *The Voice of Evidence in Reading Research* (pp.153-186). Baltimore, MD: Paul H. Brookes Publishing Co.

Elley, W. B. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly*, 24, 174-186.

Fink, R., & Samuels, S. J. (Eds.) (2008). *Inspiring reading success: Interest and motivation in an age of highstakes testing*. Newark, DE: International Reading Association, Inc.

Foorman, B. R., Breier, J. I., & Fletcher, J. M. (2003). Interventions aimed at improving reading success: An evidence-based approach. *Developmental Neuropsychology*, 24, 613-639.

Fuchs, L. S., Fuchs, D., & Compton, D. L. (2004). Monitoring early reading development in first grade: Word identification fluency versus nonsense word fluency. *Exceptional Children*, 71, 7-21.

Gamse, B. C., Jacob, R.T., Horst, M., Boulay, B., & Unlu, F. (2008). Reading First impact study final report (NCEE 2009-4038). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

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

Glenberg, A. M., & Langston, W. E. (1992). Comprehension of illustrated text: Pictures help to build mental models *Journal of Memory and Language*, 31, 129-151.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7, 6-10.

Gunn, B., Biglan, A., Smolkowski, K., & Ary, D. (2000). The efficacy of supplemental instruction in decoding skills for Hispanic and non-Hispanic students in early elementary school. *The Journal of Special Education*, 34(2), 90-103.

Harn, B. A., Linan-Thompson, S., & Roberts, G. (2008). Intensifying instruction: Does additional instructional time make a difference for the most at-risk first graders? Journal of Learning Disabilities, 41, 115-125.

Harm, M. W., & Seidenberg, M. S. (1999). Phonology, reading acquisition, and dyslexia: insights from connectionist models. *Psychological Review*, 106, 491-528.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes.

Hiebert, E. H. & Fisher, C. W. (2002, April). Text matters in developing fluent reading. Paper presented at the Preconvention Institute, "Tools for Global Understanding: Fluency, Comprehension, and Content Knowledge" at the annual meeting of the International Reading Association, San Francisco, CA.

Hempenstall, K. (2004). Abracadabra phonics: Balanced magic. Retrieved 3/20/09 at http://www.ednews.org/articles/43/1/Abracadrabra-phonics-Balanced-magic/Page1 html

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing*, 2, 127-160.

Jenkins, J. R., Peyton, J. A., Sanders, E. A., & Vadasy, P. F. (2004). Effects of reading decodable texts in supplemental first-grade tutoring. *Scientific Studies of Reading*, 8(1), 53-85.

Juel, C., & Deffes, R. (2004). Making words sticky. *Educational Leadership*, 61(6), 30-34.

Juel, C., & Minden-Cupp, C. (2000). Learning to read words: Linguistic units and instructional strategies. *Reading Research Quarterly*, 35, 458-492.

Keene, E. O. (2008). To understand: New horizons in reading comprehension. Portsmouth, NH: Heinemann.

Keene, E. O., & Zimmerman, S. (1997). *Mosaic of thought: Teaching comprehension in a reader's workshop.* Portsmouth, NH: Heinemann.

LaBerge, D., & Samuels, J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, 6, 293-323.

Lehr, F., Osborn, J., Hiebert, E. (2004). A Focus on Vocabulary. Research-Based Practices in Early Reading Series. Pacific Resources for Education and Learning. Available at: http://www.prel.org/products/re_/ES0419 htm.

Lipson, M. Y. (2006). Intelligent action as the basis for literacy instruction in classroom and clinical settings. In K. A. D. Stahl & M. C. McKenna (Eds.), *Reading Research at Work: Foundations of Effective Practice*. New York: The Guilford Press.

McNamara, T. P., Miller, D. L., & Bransford, J. D. (1991). Mental models and narrative comprehension. In R. Barr, M. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of Reading Research*, (pp. 490-511). New York: Longman.

National Reading Panel (2000). Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature in reading and its implications for reading instruction: Reports of the sub-groups. (NIH Publication No. 00-4754). Washington DC: National Institute of Child Health and Human Development.

Oster, L. (2001). Using the think-aloud for reading instruction. *The Reading Teacher*, 55, 65-69.

Paivio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology*, 45, 255-287.

Pearson, P.D. & Duke, N. K. (2002). Comprehension instruction in the primary grades. In C. C. Block & M. Pressley (Eds.) *Comprehension Instruction: Research-based Best Practices*. New York: Guilford.

Pearson, P.D. & Gallagher, M. (1983) The instruction of reading comprehension. *Contemporary Educational Psychology*, 8, 317-344.

Perfetti, C. A. (1992). The representation problem in reading acquisition. In P.B. Gough, L. C. Ehri, & R. Treiman (Eds.) *Reading Acquisition*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Perfetti, C. A. (1985). *Reading ability*. New York: Oxford Press.

Pressley, M., & Fingeret, L. (2007). What we have learned since the National Reading Panel: Visions of the next version of Reading First. In M. Pressley, A. K. Billman, K. H. Perry, K. E. Reffitt, & J. M. Reynolds (Eds.), *Shaping Literacy Achievement: Research We Have, Research We Need*. New York: The Guilford Press.

Pressley, M., Schuder, T., Teachers in the SAIL Program, Bergman, J., & El-Dinary, P. B. (1992). A researcher-educator collaborative interview study of transactional comprehension strategies instruction. *Journal of Educational Psychology*, 84, 231-243.

Quinn, M. (2007, Spring). I just want to read Frog and Toad. Rethinking Schools. Retrieved 3/13/09 from http://www.rethinkingschools.org/archive/21_03/frog213 shtml.

Rayner, K., Foorman, B. R., Perfetti, C. A., Pesetsky, D., & Seidenberg, M. S. (2001). How psychological science informs the teaching of reading. *Psychological Science in the Public Interest*, 2, 31 — 74.

Reinhart, M. (2006). *The Jungle Book*. New York: Simon & Schuster.

Schwanenflugel, P. J., Meisinger, E. B., Wisenbaker, J. M., Kuhn, M. R., Strauss, G. P., & Morris, R. D. (2006). Becoming a fluent and automatic reader in the early elementary school years. *Reading Research Quarterly*, 41, 496-522.

Senechal, M., Thomas, E., & Monker, J. (1995). Individual differences in 4-year-old children's acquisition of vocabulary during storybook reading. *Journal of Educational Psychology*, 87(2), 218-229.

Senechal, M. (1997). The differential effect of storybook reading on preschoolers' acquisition of expressive and receptive vocabulary. *Child Language*, 24,123-138.

Share, D. L., & Stanovich, K. E. (1995). Cognitive processes in early reading development: Accommodating individual differences into a model of acquisition. Issues in Education: *Contributions from Educational Psychology*, 1, 1- 57.

Snow, C. (2002a). Oral language and demographic change. Transcript from a presentation at the Institute for Statewide Literacy Initiatives, Harvard Graduate School of Education and the National Governor's Association. August 19, 2002. Cambridge, MA.

Snow, C. (2002b). Reading for understanding: Toward an R&D program in reading comprehension. Santa Monica, CA: RAND.

Snow, C. (2007). Word Generation. Transcript from a presentation at the CREATE conference. Oct 2, 2007. Oak Brook, IL.

Snow, C., and Juel, C. (2005). Teaching children to read: What do we know about how to do it? (pp. 501–520). In M. Snowling & C. Hulme, (Eds.) *The Science of Reading: A Handbook*. Oxford: Blackwell Publishing.

Stanovich, K. E. (1991). Word recognition: Changing perspectives. In R. Barr, M. Kamil, P. Mosenthal, & P D Pearson (Eds.), *Handbook of Reading Research: Volume II* (pp. 418-425). New York: Longman.

Sticht, T. G., & James, J. H. (1984). Listening and reading. In P. D. Pearson, R. Barr, M. Kamil, & P. Mosenthal (Eds.), *Handbook of Reading Research* (pp. 292-317). New York: Longman.

Torgesen, J. K. (2004). Lessons learned from research on interventions for students who have difficulty in learning to read. In P. McCardle and V. Chhabra (Eds.), *The Voice of Evidence in Reading Research.* (pp. 355-382). Baltimore: Paul H. Brookes Publishing Company.

Vadasy, P. F., Sanders, E. A., & Peyton, J. A. (2005). Relative effectiveness of reading practice or word-level instruction in supplemental tutoring: How text matters. *Journal of Learning Disabilities*, 28 (4), 364-380.

Valencia, S. W., & Buly, M. R. (2005). Behind test scores: What struggling readers really need. In S. Barrentine & S. Stokes (Ed.), *Reading Assessment: Principles and Practices for Elementary Teachers*, 2nd ed. Newark, DE: International Reading Association.

Vellutino, F. R., Scanlon, D. M., Small, S. G., & Tanzman, M. S. (1991). The linguistic basis of reading ability: converting written to oral language. *Text*, 11, 99-133.

Vellutino, F. R., Scanlon, D. M., & Tanzman, M. S. (1994). Components of reading ability: Issues and problems in operationalizing word identification, phonological coding, and orthographic coding. In G. R. Lyon (Ed.), *Frames of Reference for the Assessment of Learning Disabilities:* New Views on Measurement Issues (pp. 279-329). Baltimore: Paul H. Brookes.

Vygotsky, L. S. (1978). Mind in society: *The development of the higher psychological processes.* Cambridge, MA: The Harvard University Press. (Originally published 1930, New York: Oxford University Press.)

Walczyk, J. J., & Griffith-Ross, D. A. (2007). How important is reading skill fluency for comprehension? *The Reading Teacher*, 60, 560-569.

Weaver, C. A., & Kintsch, W. (1991). Expository text. In R. Barr, M. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of Reading Research*, (pp. 230-245). New York: Longman.

Wolf, M. (2007). *Proust and the squid: The story and science of the reading brain.* New York: HarperCollins.

Wood, S. S., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89-100.

Yuill, N. and Oakhill, J. (1988). Effects of inference awareness training on poor reading comprehension. *Journal of Applied Cognitive Psychology*, 2, 33-45.

Zeno, S. M., Ivens, S. H., Millard, R. T., & Duvvuri, R. (1995). *The educator's word frequency guide*. New York: Touchstone Applied Science Associates.

## About the Author

Diana Sharp received her Ph.D. in Cognitive Psychology when the field was first exploring how computers could uncover the processes that people use when they read. She next joined the research faculty of Peabody College at Vanderbilt University as the director and co-founder of the Young Children's Literacy Project at what soon became the world-renowned Learning Technology Center.

Diana spent 13 years at the Learning Technology Center, leading research efforts that examined the promises and pitfalls of technology for helping young students — particularly those at risk of school failure — to become skilled, motivated readers. Her work received major grants from the National Science Foundation, the U. S. Department of Education, the National Institute of Child Health and Human Development, the Office of Special Education, and the James S. McDonnell Foundation. As part of her research, Diana led the development of the Little Planet Literacy Series, a nationally award-winning multimedia program for K–3, now published by Sunburst as The Ribbit Collection, The Glowbird Collection, The Dugout Collection, and Thinking Out Loud. She also wrote over 40 of the books in that series.

Diana was also the Principal Investigator of the Take Me To Your Readers project, which was funded as part of the prestigious Interagency Educational Research Initiative, a federal multi-agency effort aimed at scaling up promising interventions. She was invited by the American Psychological Association to present at a 1999 Congressional briefing and was one of only 13 research groups invited to speak at the 2004 International Reading Association's Reading Research Conference.

In 2003, Diana started her own consulting company for educational leaders. She specializes in literacy and technology and enjoys crossing the boundaries between academic research institutions, commercial education companies, and schools.

Amplify.

For more information visit amplify.com.

**Corporate:**
55 Washington Street
Suite 800
Brooklyn, NY 11201-1071
212.796-2200

**Sales Inquiries:**
866. 212-8688 • amplify.com

© 2019 Amplify Education, Inc. All trademarks and copyrights are the property of Amplify or its licensors