RESEARCH-BASED READING

Megawords 2nd Edition

Decoding, Spelling, and Understanding Multisyllabic Words
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by Beth Davis

The No Child Left Behind Act of 2001 stipulates that all children will read proficiently by the end of third grade. There is a need, however, for continuing word study, beyond the primary grades, targeting the difficult, multisyllabic words in the reading materials students encounter daily in the middle grades (Berninger et al., 2003). Megawords provides exactly this type of study with a diagnostic and prescriptive approach, helping teachers identify what students know and do not know and helping them remediate the skill deficits. Because the program is skill based, it can be used in a variety of instructional settings and across all Response to Intervention (RTI) tiers.

Learning to Read, Reading to Learn

After third grade, the focus of classroom instruction shifts from *learning to read* to *reading to learn*; and from fourth grade on, students are expected to read a variety of genres and content-area material filled with long words and difficult concepts. If students haven't mastered the basics of decoding by that time, mastering the more advanced content—the meaning of which is largely carried by multisyllabic words—is nearly impossible. This is the reason for what is commonly referred to as the "fourth-grade slump."

Students need to have tools to help them figure out the sounds, structure, and meaning of these words. Through its direct, multisensory approach to reading and spelling, *Megawords* teaches the skills and provides the tools students need to approach multisyllabic words with confidence. Facility with these skills will ultimately increase comprehension.

Word Study Instruction

Research has shown that word study is most effective when it is systematically and explicitly taught (National Reading Panel, 2000; Snow, Burns, and Griffin, 1998; Adams, 1990; Chall, 1967, 1983,1999). Naslund and Samuels (1992) state that "implicitly or incidentally learned behavior that occurs without consciously controlled attention is not as reliably retrieved or consciously controlled as behaviors intentionally learned" (p. 150). They further add that lacking explicit instruction, "many children adopt their own strategies and procedures for word recognition, with some strategies being more accurate and adapted to the reading task than others" (p. 150). Adams (1990), discussing program comparison studies, states that "approaches including systematic phonic instruction result in comprehension skills that

The *Megawords* series consists of eight Student Books and accompanying Teacher's Guides that provide a systematic approach to decoding, spelling, and understanding the multisyllabic words encountered from the fourth grade on. Word lists are sorted by common word elements (syllabication patterns, prefixes, suffixes, vowel patterns, etc.) and followed by a series of structured, multisensory exercises that give students the strategies they need to decode and encode longer words with confidence. An accompanying assessment serves as a diagnostic placement tool within the series.

are least comparable to, and word recognition and spelling skills that are significantly better than, those that do not" (p. 49). Similar findings by the National Reading Panel (2000) were especially evident for the word reading skills of disabled and low socioeconomic learners as well as the spelling skills of able readers.

Readers acquire the ability to recognize likely spelling patterns gradually but systematically (Adams, 1990). ". . . [I]t is during the fourth grade that the adult ability to perceive syllables as units emerges; at this point normal readers begin to perceive syllables more quickly and accurately than single letters" (p. 125). Recognition of this developmental reading/spelling growth of middle school learners underscores the value of a continuing word study program such as *Megawords* that emphasizes systematic and explicit teaching of reading and spelling skills for multisyllabic words.

How *Megawords* Addresses Word Study Instruction

Megawords explicitly teaches the decoding and encoding skills needed to read, write, and comprehend multisyllabic words. Multisyllabic words in the series refer to words of two syllables or more. Warm-up activities at the beginning of each lesson give students practice pronouncing and spelling relevant one-syllable words and word parts before moving on to the longer list words.

Megawords consists of eight Student Books with accompanying Teacher's Guides. The *Megawords Assessment of Decoding and Encoding Skills* facilitates the diagnosis of individual student needs and appropriate placement within the series. In addition, each book in the series offers a Check Test—to be used as a pretest/posttest—to ascertain appropriate placement and evaluate skills needing

remediation within its sequence of lessons, allowing the teacher to further differentiate instruction.

Megawords lessons follow a consistent format that develops reading, spelling, and vocabulary skills. Each lesson begins with an extensive list of words relating to the target pattern(s). The practice pages that follow have six learning steps that begin with one-syllable words or word parts, proceed to combined word parts then to whole words, and then to words in context. The final two steps encourage students to monitor their progress in reading and spelling accuracy, word-reading proficiency, and passage-reading fluency; students are also encouraged to use their list words in writing. Point-of-use instruction in the Teacher's Guides coordinates closely with the Student Books and the six-step instructional plan.

Megawords 1 lays the foundation for the program, covering six basic syllable types and five rules for syllabication. Subsequent books focus on prefixes and suffixes (*Megawords 2, 4,* and *8*), the schwa sound in unaccented syllables (*Megawords 3* and *7*), and vowel and consonant variations (*Megawords 5* and *6*). Lessons cover accented patterns, common spelling patterns, and Greek and Latin roots as appropriate for each list.

Megawords offers a strong phonics and morphemic analysis program that provides middle graders and beyond with instruction and practice for skilled reading and writing. Using a multisensory approach in which students work with words visually, auditorally, and orthographically, its focus is on the reinforcing relationships between reading, spelling, vocabulary, and fluency.

National and state standards

Megawords also addresses essential skills identified by state and national standards.

Included in the Standards for the English Language Arts (NCTE/IRA, 1996), which provide a framework from which many of the states have established their specific standards, is recognition of the importance of developing skills for: knowledge of word meaning, word identification strategies, knowledge of language structure, and language conventions (spelling). The view of language learning promoted in the standards "emphasizes the importance of explicit attention to the learning process for all students: learning how to learn ought to be considered as fundamental as other, more widely recognized, basic skills in English language arts" (p. 9).

The state standards tend to be more prescriptive for grade level expectations and instruction. California's Department of Education, Grade Four English-Language Arts Content Standards (2001), for example, identify word analysis, fluency, and systematic vocabulary development as their first reading standard. The description reads "Students understand the basic features of reading. They select letter patterns and know how to translate them into spoken language by using phonics, syllabication, and word parts. They apply this knowledge to achieve fluent oral and silent reading."

Three of the subcategories of vocabulary development identify "knowledge of word origins, derivations, . . . to determine the meanings of words and phrases," "knowledge of root words to determine the meaning of unknown words within a passage," and the use of common roots and affixes derived from Greek and Latin "to analyze the meaning of complex words." The spelling standard aims for correctly spelled "roots, inflections, suffixes and prefixes, and syllable constructions."

How *Megawords* addresses and extends national and state standards

The *Megawords* program, through its emphasis on understanding how syllabication influences both word recognition and spelling, gives students tools for "learning how to learn," as advocated by the Standards for the English Language Arts (NCTE/IRA, 1998). The emphasis on morphemic analysis, which has students working with roots, prefixes, word families, and word origins further expands self-learning strategies to a focus on word meaning. Patterns of specific phonics and morphologic elements recognized by states (CA, 1997; NE, 2001) as appropriate for fourth grade are learned and practiced through both reading and writing, first in word parts and then in whole words. A range of exercises, many of which use context (cloze, crosswords, synonyms, etc.), promote fluency of word recognition, spelling, and word meaning.

Curriculum research

Reading

The acquisition of reading skills is often described as proceeding through five stages (Ehri and McCormick, 1998). The fourth stage, the "consolidated-alphabetic phase" moves from earlier acquired knowledge of grapheme-phoneme relations to recognition of larger, consolidated units or chunks that recur in varied words. These chunks include morphemes (affixes, root words), syllables, and vowel configurations whose locations within the word may influence their pronunciation. As readers successfully decode words, the brain either recognizes a spelling pattern or relates it to a similar known pattern. With multisyllabic words, the brain's knowledge of which letters typically are found together in words allows the reader to separate the word

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into these manageable chunks to pronounce them (Cunningham, 1988). By processing larger and therefore fewer units within words, students improve both sight word and decoding accuracy and speed.

Ehri and McCormick (1998) recommend that at this stage, work with multisyllabic words should have students "locating vowel nucleii and pronouncing each vowel with its adjacent consonants as a separate syllable" (p. 155). Word study that looks at the linguistic origins of roots and affixes and relates meanings and word parts also aids accurate decoding at this stage. Nagy, Anderson, et al (1989) found that derivational and inflectional relationships of words influence the speed and accuracy of word recognition. This suggests, they conclude, that words are morphologically linked in one's internal lexicon; activating a derivative, for example, partially activates the stem and other related words as well. The instructional implications of these findings support the teaching of morphological "families."

Cunningham (1998), investigating research concerning the relationship of multisyllabic words with morphology, notes that "readers' morphological sophistication—the ability to gain information about the meaning, pronunciation, and part of speech of words from their prefixes, roots, and suffixes—is thought to play a large role in how effectively they deal with new long words" (p. 193). She adds that "knowledge of affixes and roots may be helpful in decoding and spelling words even where these units do not supply useful information about the meanings of words" (p. 199).

This has particular importance for assisting less capable readers to meet the plethora of multisyllabic words they encounter. "Orthographic recoding through applications of word pattern analysis, use of typical word

units, and recognition of prefixes and suffixes must receive direct practice for disabled readers to become skillful in identifying these words" (Ehri and McCormick, p. 156).

Shefelbine (1990) found that direct instruction and practice with word parts aided fourth and sixth grade readers with learning differences when pronouncing multisyllabic words. "Directly teaching students how to pronounce and identify syllable units and then showing them how such units work in polysyllabic words appears to be a worthwhile component of syllabication instruction and should help reduce or remediate this source of reading difficulty among intermediate students" (p. 228). Knowledge of the six types of syllables helps with syllabication because it "teaches students to attend to spelling patterns…. Each syllable type gives a clue about vowel sounds, thereby aiding more accurate, independent decoding" (Knight-McKenna, 2008, pp. 18–19.)

When students proceed to the fifth stage, the "automatic phase" (Ehri and McCormick, 1998), they have acquired multiple strategies for word recognition that reinforce one another to produce accurate, fluent decoding. To retain sight words in memory requires fully analyzing words through decoding (Gaskins, Ehri et al., 1996/7). Students use analogy strategies to relate new words to known sight words and/or word parts. All decoding is facilitated by the recognition of word pattern analysis. Encoding practice helps to cement pattern recognition. Successful decoding triggers meaning, which in turn confirms and reinforces word recognition. The focus at this stage is on word meaning and fluency.

Spelling

Current research about reading and writing recognizes the importance of understanding how patterns of word structure (orthography) signal both

sound and meaning (Templeton, 1983, 1992; Bear and Templeton, 1998; Cunningham, 1998; Templeton and Morris, 1999). Spelling instruction that focuses on these patterns of structure, sound, and meaning facilitates efficient, fluent reading as well as writing (Templeton, 1992; Templeton and Morris, 1999).

Spelling skills, like reading skills, are acquired developmentally in stages (Zutell, 1998; Bear and Templeton, 1998). Correlating with the "consolidated-alphabetic" stage in reading, middle schoolers, having achieved some proficiency with "within-word pattern spelling" of single syllable words, may be spelling at the "syllable juncture" stage. At this stage, students are examining what happens when syllables come together in multisyllabic words. Having learned the consequences of adding simple inflectional endings (–*ed*, –*ing*), students apply their knowledge of "*hopping* versus *hoping*" to understanding how open and closed syllables within multisyllabic words affect spelling. For example, a short vowel sound may signal the need for a double consonant, as in the word *letter*, while a long vowel sound calls for a single consonant as in *paper*. In addition, as students work with adding prefixes and suffixes to base words, they begin to learn how meaning also influences spelling (Bear and Templeton, 1998).

The meaning-spelling relationship is more fully developed as students move into "derivational constancy spelling" (Bear and Templeton, 1998). Students learn that words related in meaning retain a common base word spelling despite differences in sound or pronunciation (*sign*, *signal*). Meaning at this stage takes precedence over sound (Templeton, 1983; Bear and Templeton, 1998).

Sound relationships between these meaning related words may differ because of silent consonants in base words (*sign, signal; crumb, crumble*). Sound-symbol relationships may also be influenced by the effects of accent on vowel sounds. The unaccented schwa is the culprit here. Whereas the spelling of the final syllable in words like *final* and *mobile* may appear to be arbitrary, the spelling becomes clear when meaning related words like *finality* and *mobility* are considered. Recalling the base word *compose* helps with the spelling of *composition* (Templeton, 1983). "Regardless of how words may differ in pronunciation, the spelling has visually preserved their meaning relationships" (Templeton, 1983). Because so many of our words are derived from Greek and Latin, students' spelling abilities are facilitated by an awareness of the families of words that are related morphologically to these roots.

Although by fourth grade students are immersed in authentic reading and writing activities which offer them opportunities to acquire spelling skills incidentally, systematic explicit teaching of spelling skills should accompany these activities. "Most learners need adequate time spent examining words and patterns to lock in the spelling pattern, leading to the automaticity that serves both writing, and reading. Though important, incidental teaching and learning are usually not sufficient for this level of processing" (Templeton and Morris, 1999, p. 110).

Vocabulary

The ultimate goal of reading is comprehension, yet despite skill in word recognition (pronunciation), if the meanings of words contained in the text are unknown, comprehension of the text is adversely affected. Andrew Biemiller (2001) reports "that while more children learn to 'read' with increased phonics instruction, there have not been commensurate gains in reading comprehension. What is missing from

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Vocabulary knowledge, however, is also important for word recognition. Word meanings help to clarify appropriate syllable accent and related vowel sounds. If words are unfamiliar to students, they have no means of verifying their attempts at pronunciation.

any children who master phonics but don't understand well is vocabulary, the words they need to know in order to understand what they're reading" (p. 25). Vocabulary knowledge, however, is also important for word recognition. Word meanings help to clarify appropriate syllable accent and related vowel sounds. If words are unfamiliar to students, they have no means of verifying their attempts at pronunciation.

Chall (1987) reflects on the two vocabularies needed for reading. She refers to word recognition as the "medium" for conveying word meaning, the "message." In grades one through three, learning the medium is the focus of instruction for most children who understand most of the common words they are learning to identify and decode. Starting in grade four, however, it is the message, word meaning, which needs instructional attention. The reading materials at this level contain "an ever greater number of words that are unfamiliar, rare, specialized, abstract, literary, and bookish. The shift also takes place in children's language. Up to age ten, the words they know are mostly concrete, and most of their definitions are concrete. At age ten and later, they are able to define more abstract words, and their definitions tend to move from the concrete to the more abstract and general" (p. 8).

The disconnect or gap between fourth-graders' vocabulary knowledge and text vocabulary appears to be particularly evident in low income children who through third grade (where their reading material reflects more common language) have shown no differences from the general population (Chall and Jacobs, 2003; Moats, 2001). Entering kindergarten with vocabulary scores at the fifth percentile on average, these children, while growing in vocabulary knowledge in the primary grades, do not catch up (Moats, 2001). The contextual

supports and multiple readings that characterize the primary grades are replaced in fourth grade by far more independence often in reading texts with specialized vocabularies. Unable to understand the meanings of so many of the words, they are unable to utilize context and comprehension skills suffer.

An average middle school reader is thought to encounter about one million words in written text per year (Nagy and Anderson, 1984), with as many as fifty-five thousand of these words unknown (Nagy, Herman, and Anderson, 1985). Chall (1987), reviewing both current and earlier research on meaning vocabularies, found consensus that significant gains can result from direct teaching, "benefiting particularly those of lower ability" (p. 12). One way to help students acquire vocabulary knowledge is to focus instruction on the direct teaching of morphology with the goal of fostering independence in determining word meanings through the combined use of morphology and context (Nagy and Anderson, 1984; Nagy and Scott, 2000; Baumann, Edwards et al., 2002).

Investigating the instructional vocabulary issues arising from the number of words found in school texts, English, Nagy, and Anderson (1984) estimated that "for every word the child learns, there are an average of one to three additional related words that should also be understandable to the child, the exact number depending on how well the child is able to utilize context and morphology to induce meanings" (p. 304). For a large percentage of derived words, knowledge of a base word accesses the meaning of affixed words for that root. Consequently, by considering words in terms of their morphological families, total numbers of words to be learned are reduced significantly. Not only are derivatives more easily learned when one member of the

family is known but any effort that is expended toward this goal also serves to "reinforce the learning of the base word" (p. 324).

Wysocki and Jenkins (1987) tested the ability of fourth-, sixth-, and eighth-grade students to use morphological and contextual information to derive meanings for unknown words. They conclude that "we are left with little doubt that elementary students of this age are able to use morphological information to confirm word meanings" (p. 80). White, Power, and White (1989) tested third- and fourth-grade students with semantically transparent affixed words (words whose meanings may be accessed by knowledge of the base word) and concluded that students starting in fourth grade would benefit dramatically from instruction in the meanings of the four most common prefixes (*un-*, *re-*, *dis-*, *in-/im-/ir-*), practice in analyzing words with these prefixes, practice in removing neutral derivational suffixes (*-able/-ible*, *-ly*, *-ness*), and review of spelling implications for common inflectional suffixes (*-s*, *-es*, *-ed*, *-ing*). "In addition, the probability of successful analysis [of unfamiliar affixed words] should increase as the student learns the meanings for more roots and affixes" (p.301).

Fluency

One of the characteristics distinguishing good from poor readers is fluency. Skilled readers are fluent readers. They exhibit accuracy, automaticity, and speed in their word recognition behaviors (Pressley, 2002; Taylor, Wade, and Yekovich, 1985).

Word recognition skill develops in three stages. At the first, nonaccurate stage, students struggle to try to figure out the word. At the accuracy stage, word recognition occurs but requires considerable attention. At the third level, the automatic stage, words are recognized instantly without conscious

effort (Samuels, 1979). Short-term memory is one's conscious mind where words are perceived and acted upon—decoded, and comprehended. The capacity of short-term memory accommodates only a limited amount of information at a time. When the reader moves through a word, blending sound by sound rather than seeing it as one familiar chunk, little capacity remains "for comprehension of the word, let alone understanding the overall meaning of the sentence containing the word and the paragraph containing the sentence" (Pressley, 2002, p. 67). When, however, readers' word recognition skills are automatic (instantaneous and unconscious), their conscious attention is freed to focus on comprehension (Hirsch 2003; Pressley, 2002; Rasinski, 2000; Stanovich, 1993/94; Samuels, 1979). Byrne, Freebody, and Gates (1992) found that after second grade a lack of decoding skills will progressively disrupt comprehension.

Often students who exhibit fluent reading behaviors in the primary school years cannot sustain fluency when confronted with multisyllabic words for which recognition may be at the accuracy stage, at best. These students benefit from systematic, explicit teaching of syllabic and morphological patterns. "Teachers can do two things to help students achieve automaticity in word recognition. They can give instruction on how to recognize words at the accuracy level. Second, they can provide the time and the motivation so that the student will practice the word recognition skills until they become automatic" (Samuels, 1979, p. 379).

While word automaticity is necessary for fluency, it is not sufficient (National Reading Panel, 2000, p. 24). Students should also be given opportunities to read and reread passages of text aloud several times, with feedback from the teacher, as they work towards individual fluency goals. Repeated oral

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reading improves speed and accuracy in word recognition, promotes proper expression, and even improves comprehension.

How *Megawords* addresses this research

"Given the accumulated research from meaning vocabulary, spelling development, and word recognition research, it seems obvious that work with big words should focus simultaneously on meaning, spelling, and reading" (Cunningham, 1998, p. 199). *Megawords* acknowledges the interrelationship between word recognition, spelling, and vocabulary knowledge.

The focus throughout the eight books of the program is consistent with syllabic and morphemic knowledge needed at the fourth-grade reading and spelling developmental stages. When the emphasis is on reading and spelling words containing patterns of phonetic elements (for example, open and closed syllables, double vowels and other sophisticated spelling chunks such as *sch*, syllable accent, and the resulting use of the schwa sound), cloze exercises, crossword puzzles, vocabulary exercises, and dictionary work are used consistently to reinforce word meanings. When students are taught concepts that enable them to decode and spell morphological elements, groups of family words are taught together (*Megawords 8*: *suggest*, *suggestibility*, *suggested*, *suggestion*, *suggestible*, *suggestive*) with cloze sentences to help students recognize the meanings of the individual related words. The many lessons that work with prefixes and suffixes define the meanings of the affixes and give students multiple opportunities to use the affixed words meaningfully in exercises like those described above. Students are encouraged to apply the newly learned words in the writing assignments that conclude each lesson.

Working to build fluency, *Megawords* incorporates reading, spelling and meaning reinforcement at the accuracy stage throughout all practice pages in the eight books. Each lesson offers multiple exposures to the words and word parts, incorporating reading in isolation and in context, spelling, and writing, with each of the multisensory activities building and reinforcing memory. Activities for differentiating instruction, including the creation of drill cards, are described in the teacher's guides. After students have completed the practice pages activities, the teacher administers Skill Checks—accuracy checks for reading and spelling ten representative words from the lesson's word list. Once students achieve the ninety percent accuracy goal with their reading, timed rereadings of the entire word list focus the student on building speed and automaticity of word recognition for these words (and patterns). Students then have an opportunity to read list words and review words in a longer passage and answer comprehension questions about it. They may then do repeated readings of the passage as they work towards individual fluency goals. The rereadings of both the word list and the passage are graphed so that students may monitor their progress, a technique found to motivate students to improve (Samuels, 1979).

Megawords encourages spelling fluency as well. Varieties of opportunities are provided for the students to write segments of the words, the complete spelling of the words, and do activities with the words, examples of which include: cloze, words sorts, word searches, combining syllables to build words, proofreading, and crossword puzzles. Towards the end of each lesson is a spelling Skill Check (a dictation). Students are also encouraged to use newly learned list words in their writing. The goal is to free up attention from the word so that

students may focus on the content of their writing.

How *Megawords* can help teachers

Given the evidence that fourth graders need systematic, and explicit teaching of phonics, syllabication, and morphemic analysis skills, teachers must have appropriate knowledge of language structure and conventions. They need to "present linguistic concepts accurately and with appropriate examples and . . . assess and interpret the student's stage of reading and spelling development based on direct observation of his or her performance"(Moats, 1995, p. 44). Research has shown that often they do not have sufficient understanding of the linguistic skills needed to do this (Moats, 1995; Johnston, 2001). "Teachers commonly are misinformed about the differences between speech and print and about how print represents speech" (Moats, 1995, p. 47).

Megawords is a complete word study program that educates the teacher as well as the students. The Teacher's Guides provide direct, point-of-use instruction according to a six-step instructional plan. Soft scripting provides teachers with language to introduce new concepts but allows for flexibility in delivery. Differentiating Instruction activities offer additional ideas for reinforcing or extending the concepts presented in each list. Frequent assessments include directions for monitoring students' progress on each word list. Each guide also includes at least a page of special considerations for the skills contained in that book with suggestions for behaviors the teacher may wish to look for or promote and suggestions of games and activities that may be used to reinforce the learning. Other teacher resources include an answer key, assessment and recording forms, and

reference materials that summarize the concepts covered in that book.

The tests in the *Megawords Assessment of Decoding and Encoding Skills* correspond to the eight *Megawords* books and provide the teacher detailed error analysis for both the decoding and the encoding assessments to assure appropriate placement and determination of skill needs.

The focus of instruction from fourth grade on is comprehension. The reading load increases as does the degree of independent reading and writing. *Megawords* offers an individualized program of word recognition, spelling, meaning, and fluency instruction of multisyllabic words that will provide students with tools for increased independence in reading, comprehension, and writing.

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Beth Davis received her B.A. in history from Smith College and M.Ed. in Reading from Boston College. She has been teaching Elementary Reading at Brandeis University for almost 30 years to both Brandeis and Wellesley College students. She began her career as an elementary classroom teacher in Hamden, Connecticut, and subsequently taught elementary reading courses concurrently at Boston College and Brandeis University. She has been an evaluator for Title I programs in Massachusetts, has instructed tutors for School Volunteers for Boston, has given numerous workshops to school systems in the greater Boston area, and has been a presenter at the Massachusetts Reading Association. She also coaches volunteer tutoring teams for the Jewish Coalition for Literacy in Boston. Ms. Davis is the author of several literature packets for students and teachers (*Novel Ideas*, Sundance Publishing). She co-authored *The Remedial Reading Handbook* (Prentice-Hall, 1985) and *Elementary Reading: Strategies that Work* (Allyn & Bacon, 1995).

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