

How *Jamestown Reading Navigator*<sup>™</sup>  
Supports Research-Based Instruction  
for Struggling Adolescent Readers

# Vocabulary

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## About This Paper

This paper presents research-supported best practices related to instruction of struggling adolescent readers—that is, students in grades 6–12 who are reading at least two levels below grade level—and describes how *Jamestown Reading Navigator*<sup>™</sup> supports those practices.

### What Is *Jamestown Reading Navigator*?

*Jamestown Reading Navigator* is a reading intervention program designed specifically for students in grades 6–12 who are reading two or more reading levels below their grade in school. The program provides direct, explicit instruction and modeling of good reading practices, together with opportunities for students to practice and apply these reading strategies.

*Jamestown Reading Navigator* combines online activities featuring interactive multimedia for students to complete; engaging and appropriate online and print texts for students to read; an audio component for further guided or independent study; student writing in response to reading; student recording of fluency passages; an assessment program to monitor students' progress; an independent measure of progress monitoring; and teacher support materials, including professional development, lesson plans, instructional recommendations, and reteaching skills support. Major areas of focus for *Jamestown Reading Navigator* include

- Comprehension skills and strategies, designed for application to content-area reading
- Vocabulary
- Writing
- Fluency
- Decoding/phonics (for students with a particular need in this area)

The *Jamestown Reading Navigator* Learner Management System helps teachers manage individual student learning and provides ongoing, up-to-the-minute information on how students are performing. Online professional development modules and on-site professional development sessions offered by Jamestown Education help educators—teachers, administrators, literacy specialists, and others—learn how to implement *Jamestown Reading Navigator* more effectively. These sessions also provide information and suggestions to help educators develop effective strategies for working with struggling adolescent readers.

*Jamestown Reading Navigator* has been developed based on the most up-to-date research and expert thinking in adolescent literacy, drawing on more than 30 years of experience in reaching adolescent readers with the popular Jamestown Education print series. This paper describes the match between *Jamestown Reading Navigator* and the best available instructional thinking in a variety of specific areas that are important to the success of struggling adolescent readers, as described below.

## Introduction

### A Critical Need to Support Struggling Adolescent Readers

Problems with literacy have serious and long-lasting consequences. A lack of literacy skills is “one of the most commonly cited reasons” for students to drop out of school (Biancarosa & Snow, 2006, p. 7). A resource guide on adolescent literacy prepared for the Southwest Educational Development Laboratory described the problem as follows:

For secondary-level students . . . the social and economic consequences of not reading well can be cumulative and profound: the failure to attain a high school diploma, a barrier to higher education, underemployment or unemployment, and difficulty in managing personal and family life. Years of failing at what is deemed a hallmark of intelligence and worth can also leave struggling readers with emotional consequences, such as anxiety and low self-esteem, that affect personality and interpersonal relationships. These effects within and beyond the classroom walls show that by the secondary grades educators can no longer defer solutions to future development or instruction. (Peterson et al., 2000, p. 6)<sup>1</sup>

<sup>1</sup> Peterson et al. (2000) is laid out in a paginated PDF format, but the format does not include page numbers. Page references for quotes from Peterson et al. (2000) that are given in this paper have therefore been calculated on the basis of page numbers shown in the document table of contents.

Numerous sources attest to the scope of the challenge. *Reading Next* cited both results from the National Assessment of Educational Progress (NAEP) and the opinions of experts in adolescent literacy that “as many as 70 percent of students struggle with reading in some manner” that requires instruction differentiated for their specific needs (Biancarosa & Snow, 2006, p. 8, citing Loomis & Bourque, 2001; NCES, 1999, 2006; Olson, 2006).

Adolescents struggle with literacy for a variety of reasons. For some, English may not be their first language. Others may have mild learning disabilities. In many cases, students may simply lack experience and skill with reading. Unfortunately, difficulties in reading don’t cure themselves, but instead tend to get worse as students get older—a phenomenon reading experts refer to as the “Matthew Effect” (Stanovich, 1986). These students need literacy instruction that addresses the specific challenges they face, using the best available research-based methods and principles, in order to improve their chances of succeeding both during school and afterward.

### The State of Research on Struggling Adolescent Readers

Over the last two decades, attempts to improve student literacy on the national level have focused largely on elementary instruction, and particularly on early literacy—that is, literacy at the primary grades. For example, the focus of the Reading First initiative was on improving literacy at the primary levels. Recently, however, a number of efforts—including research summaries for a variety of sources, publication of the *Reading Next* report and other documents from the Alliance for Excellent Education, and position statements from organizations such as the National Reading Conference and the International Reading Association—have helped create a higher profile for instructional issues related to adolescent readers, and particularly the large proportion of adolescents who struggle with reading.

Initiatives such as the No Child Left Behind Act have raised expectations for instruction. Instruction is expected to be backed with solid research that concludes it is likely to result in the desired impact on student learning. Unfortunately, research on what constitutes effective literacy instruction for adolescents is still limited. According to the editors of a volume intended to “compile from the best researchers in the field a summary and synthesis of adolescent literacy research and practice,”

As of 2003, there is not a body of research to tell us appropriate interventions that will help struggling middle and secondary school readers who can barely read. As of 2003, we still do not have a body of research to provide us with appropriate interventions to help high school readers who can read fluently but remain 3 or 4 years below grade level in reading. (Jetton & Dole, 2004, p. 6)

Although research on what constitutes effective literacy instruction for adolescents is limited in significant ways, there is substantial support in research and expert opinion for a variety of specific instructional recommendations. The state of knowledge with regard to effective instruction for struggling adolescent readers fits the description of *best available evidence* as characterized by U.S. Department of Education Assistant Secretary Grover J. Whitehurst: that is, “the integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction” (Whitehurst, 2002).

### The Reading Next Report

A critical milestone in recent efforts to highlight the challenges related to adolescent literacy was the publication of *Reading Next*, a report to Carnegie Corporation of New York focusing on the needs of adolescent readers (defined in the report as those in grades 4–12), with a special emphasis on the needs of struggling readers. Preparation of this report included the following steps.

- A panel of five nationally known and respected educational researchers was convened in spring 2004, together with representatives of Carnegie Corporation of New York and the Alliance for Excellent Education.
- These panelists drew up a set of recommendations for how to meet the needs of struggling readers, including 15 specific elements of effective adolescent literacy programs that had “a substantial base in research and/or professional opinion” (Biancarosa & Snow, 2006, p. 12). These included both elements with an instructional focus and recommended infrastructure elements to improve adolescent literacy.

- The resulting paper was reviewed and augmented at the 2004 meeting of the Adolescent Literacy Funders Forum (ALFF).
- An Appendix was compiled of literature supporting each of the report’s main recommendations.
- In 2006, a second edition of the report was published.

The *Reading Next* recommendations thus represented a synthesis of research-informed expert opinion that serves as an important touchstone for much of what is known about effective adolescent literacy instruction. Several caveats, however, are in order with regard to using the recommendations as a yardstick for measuring instructional programs in general, and *Jamestown Reading Navigator* in particular.

- While all 15 elements identified by *Reading Next* are characterized as having “a substantial base in research and/or professional opinion” (Biancarosa & Snow, 2006, p. 12), the report nonetheless cautions that “the optimal mix of these factors has yet to be determined. . . . Nor does the remediation of adolescent literacy difficulties involve indiscriminately layering on all fifteen key elements. Choices should be matched to school and student needs” (Biancarosa & Snow, 2006, p. 29). The expectation is not that each literacy program should necessarily include all 15 elements, but that developers and adopters of such programs should select those elements that seem best matched to their specific circumstances.
- The focus of *Reading Next* is explicitly on “the large population of struggling students who already decode accurately but still struggle with reading and writing after third grade” (Biancarosa & Snow, 2006, p. 11). The report thus does not include recommendations related to areas such as decoding and fluency that may be important for readers who are struggling at a more basic level.
- Several of the elements of *Reading Next* relate to how infrastructure impacts adolescent literacy learning. The most that any purchased instructional program can do in these areas is to provide support to schools and districts as they implement these elements.

#### Development of This Paper

Development of this research-based white paper included the following steps.

- A top-level review of *Reading Next* was conducted to identify claims and recommended practices, including both those that are associated with the 15 key elements of adolescent literacy identified in the report and those that appear elsewhere in the report. As part of this review, information was collected about the sources in the Appendix to *Reading Next*, which listed literature supporting each of the 15 key elements.
- Well-known experts in the field of adolescent literacy were consulted to identify key, current, and reputable sources related to instruction for struggling adolescent readers. These included both experts who had been consulted during the development of *Jamestown Reading Navigator* and an independent expert not previously associated with the program.<sup>2</sup>
- Key documents were identified for review, with priority given to two types of documents:
  - *Broad policy-oriented research reviews and surveys of expert opinion, developed by reputable institutions and authors, with a goal of identifying key elements in effective adolescent literacy programs*
  - *More focused research syntheses and meta-analyses from reputable sources, describing the state of research and/or theory related to a specific relevant topic in adolescent literacy (e.g., comprehension, writing, formative assessment)*

<sup>2</sup> Key contributors included Dr. Thomas W. Bean, professor in literacy/reading and coordinator of doctoral studies in the Department of Curriculum and Instruction, University of Nevada at Las Vegas; Dr. William G. Brozo, professor of literacy, Graduate School of Education, George Mason University; and Dr. Douglas Fisher, professor of language and literacy education, San Diego State University. Drs. Brozo and Fisher had previously consulted with the development team for *Jamestown Reading Navigator*. These experts provided input into interpretation of the research literature, as well as recommendations of sources to review, but are not responsible for writing the summaries of the literature or for developing the correlations of the instructional recommendations to *Jamestown Reading Navigator*.

In addition to these two types of documents, some specific research reports were also identified for review, in the case of studies that were particularly germane to topics under investigation.

- Sources were reviewed and summarized, with special reference to
  - *Specific instructional recommendations*
  - *The nature of the evidence supporting each recommendation*
- Instructional recommendations were consolidated from multiple sources.
- Cross-comparison of the research-based recommendations and *Jamestown Reading Navigator* verified that *Jamestown Reading Navigator* supports each research-based recommendation listed in this paper.

In the final paper as presented here, each section spells out specific instructional recommendations that are supported by a mix of research and expert opinion. A table then provides information on how *Jamestown Reading Navigator* aligns with each recommendation.

Key policy-oriented documents and research syntheses that were reviewed for this paper are listed in the References section of the complete White Paper.

## VOCABULARY

“The importance of semantic knowledge shows up in the strong correlations between comprehension and the size and degree of both general and passage-specific word knowledge, or vocabulary.”—*Building Reading Proficiency at the Secondary Level: A Guide to Resources*, Southwest Educational Development Laboratory (Peterson et al., 2000, p. 13, citing Beck & McKeown, 1991)

“[A]most all students need to be supported as they learn unfamiliar vocabulary.”—Position statement from the International Reading Association’s Commission on Adolescent Literacy (Moore et al., 1999, p. 4)

### The Role of Vocabulary Knowledge in Adolescent Literacy

Vocabulary knowledge is a key component of both general reading comprehension and content-area literacy. As Pressley (2000) stated,

The extent of a reader’s vocabulary is related to the person’s comprehension skills (e.g., Anderson & Freebody, 1981; Nagy, Anderson, & Herman, 1987). Particularly important here, there are experimental data making clear that a more extensive vocabulary promotes comprehension skill. (p. 548, citing Beck, Perfetti, & McKeown, 1982; McKeown, Beck, Omanson, & Perfetti, 1983; McKeown, Beck, Omanson, & Pople, 1985)

As students grow older, vocabulary knowledge becomes critical not only for general reading comprehension, but also for content-area learning. As Readence and colleagues (2004) wrote,

All groups of people . . . share special idioms and technical terminology which characterize the group. “Insiders” use this vocabulary freely and through it gain access to the collective knowledge of the group. . . .

The task of the content teacher is to help students become insiders whose minds move with facility in the fields of science, English, social studies, or mathematics. To a large extent, this is accomplished by teaching them the technical terminology of each discipline. (p. 139)

### Vocabulary Acquisition

According to Pressley (2000), “Although vocabulary can be taught, most vocabulary words are learned incidentally as a function of encounters in context” (p. 548, citing Sternberg, 1987). Such word acquisition is not automatic; indeed, research has found that only 5 percent to 15 percent of the unfamiliar words readers encounter will actually be learned from that encounter (Beck et al., 2002, citing Nagy, Herman, & Anderson, 1985; Swanborn & de Glopper, 1999). Researchers have identified a variety of factors that affect whether and how easily individuals learn specific words from context, including how many encounters they have with the word; the range and variety of sources for those encounters; and how the word is referenced within the text for those encounters (Blachowicz and Fisher, 2000, p. 508; Baumann et al., 2003, pp. 755–756).

An important complicating factor in describing vocabulary learning is the fact that students’ word learning is not simply an on/off switch, but rather a matter of degree and even type of knowledge. For example, it may require less knowledge to understand what a word means within a specific written context than to use it appropriately in writing or speaking (Baumann et al., 2003, p. 755). As Beck and colleagues (2002) stated,

It is not the case that one either knows or does not know a word. In fact, word knowledge is a rather complex concept. . . . [T]he extent of knowledge one may have about individual words can range from a little to a lot, and . . . there are qualitatively different kinds of knowledge about words. (p. 9)

Depending on the measure that is used, the same person may be assessed as either knowing or not knowing a specific word.

### Vocabulary Instruction

Researchers describe several broad approaches to learning vocabulary, including

- Encouraging wide reading and broad language exposure to stimulate students’ incidental word learning
- Instruction in transferable and generalizable strategies that can help students become more proficient at learning vocabulary on their own
- Direct instruction in specific vocabulary words

Research supports all three broad approaches. Because they operate in different ways and toward different goals, there is a potential value in incorporating all these approaches as part of vocabulary instruction. For example, Baumann and colleagues (2003) recommended that programs for teaching vocabulary should “Include goals that provide for teacher-initiated vocabulary learning as well as ones that strive for student independence in vocabulary learning” and should “Include instruction in both specific-word and transferable and generalizable strategies” (p. 777).

Potentially, vocabulary instruction can result in several types of positive outcomes:

- Instruction in use of word-learning strategies can transfer, so that students are more likely to successfully apply the strategies with words they have not previously learned.
- Instruction in use of word-learning strategies can transfer, leading to improved comprehension of texts where use of such strategies is appropriate.
- Instruction in specific words can lead to improved word identification or generation of correct word meanings.
- Instruction in specific words can lead to improved comprehension of texts that use those words.

Any of these outcomes represent some level of positive results from instruction. The underlying assumption of research focused on word-level outcomes seems to be that instruction that leads to improved knowledge of specific vocabulary words may have a long-term, aggregate impact on text comprehension, even if that outcome is not immediately measurable.

Vocabulary instruction is particularly critical for English language learners. Describing the immense difficulty faced by ELL students in learning academic English, Short and Fitzsimmons (2007) stated,

The academic vocabulary challenge alone is overwhelming. Consider that high school students are expected to have a vocabulary of approximately 50,000 words to be able to master the increasingly complex coursework of high school (Graves, 2006; Nagy & Anderson, 1984) and the average student learns 3,000 new words each year. In four years, then, the average beginning ELL might learn 12,000 to 15,000 words without targeted interventions, falling far short of the 50,000-word goal. (pp. 26–27)

As noted above, vocabulary knowledge is also particularly important for content-area learning, in part because so much critical content-area knowledge consists of learning meanings of key technical vocabulary. Readence et al. (2004) cautioned that much of this vocabulary must be directly taught:

If there is one thing which contributes most heavily to the burdens of learning technical vocabulary, it is the simple lack of direct instruction. Teachers frequently assume that students will automatically assimilate new words just because they are introduced in textbook assignments. This is a mistake. While incidental learning of word meanings may occur with narrative, story-type material, even across cultures . . . this will, more than likely, not occur with textbook material. (p. 148)

## Instructional Recommendations

### General Guidelines and Approaches

- **Systematic and sustained approach.** Based on their analysis of research on vocabulary instruction, Baumann and colleagues (2003) recommended that teachers should “Establish vocabulary learning goals for your students” and “Provide struggling readers a systematic and sustained program of vocabulary instruction that teaches them more important words and efficient strategies in less time” (p. 777, citing Baker et al., 1998a; Kame’enui & Simmons, 1990; Stanovich, 1986).
- **Extensive reading.** There is disagreement among researchers about the extent to which vocabulary develops automatically in readers—particularly struggling readers—versus the need for direct instruction. There is universal agreement, however, that vocabulary knowledge *does* develop as a side effect from reading. As Baumann and colleagues (2003) stated in their review of research on vocabulary instruction, “We certainly agree with Nagy et al. (1987) and Cunningham and Stanovich (1998) that word learning does occur during normal reading and that wide reading is a necessary and probably a causal factor for large levels of vocabulary growth” (p. 761). Similarly, Allington (2006) cited McQuillan’s (1998) summary of correlational studies that “have produced consistent findings showing positive correlations between the measures of reading activity [author and/or title recognition checklists] and reading comprehension and vocabulary development” (Allington, 2006, p. 39). This suggests an emphasis on broad, extensive reading as a method to develop vocabulary knowledge, both in order to introduce new words and to broaden and deepen students’ understanding of words to which they have already been exposed.
- **Use of audio with written texts.** According to a review of research on adolescent English language learners, “The use of audio books can also support students’ literacy development, especially if students follow along with a written text; the recordings provide students with models for pronunciation and read-aloud fluency. For students whose spoken English is better than their reading skills, hearing the words read aloud can aid in vocabulary comprehension” (Short & Fitzsimmons, 2007, p. 37).
- **Word-rich environment.** One of four principles identified by Blachowicz and Fisher (2000) for guiding vocabulary instruction, based on their analysis of research on vocabulary instruction, was that “students should be immersed in words” (p. 504).
  - According to Blachowicz and Fisher (2000), “Listening studies . . . studies of family literacy . . . studies of wide reading . . . and more focused studies of incidental word learning from context . . . all support the importance of exposing students to rich language environments. These studies with varying contexts and ages of learners all confirm that environments where language and word use are celebrated and noted encourage vocabulary learning” (Blachowicz & Fisher, 2000, p. 507).

- Along similar lines, Baumann et al. (2003) identified one possible objective for vocabulary instructional programs as being to “Help students to develop an appreciation for words and to experience enjoyment and satisfaction in their use” (p. 778). Potential ways of doing this included the following:

“Set a positive model. Demonstrate how word play can be interesting and enjoyable by expressing the value in possessing a versatile vocabulary and by demonstrating how word learning can be interesting and fun” (p. 778).

“Have fun with words. Play word games linked to content topics and ones that may be done purely for entertainment and enjoyment” (p. 778).

- **Contextual analysis.** According to Baumann and colleagues, “[R]esearch on teaching the process of contextual analysis as a transferable and generalizable skill is somewhat limited and at times equivocal (cf. Askov & Kamm, 1976; Hafner, 1965). However, experiments by Buikema and Graves (1993), Jenkins et al. (1989), Patberg et al. (1984), and Sternberg (1987) provide some evidence that instruction in contextual analysis may enable students to infer the meanings of words that have not been taught directly” (p. 772). Baumann et al. concluded: “Research on teaching contextual analysis as a transferable and generalizable strategy for word learning suggests that instruction does facilitate students’ ability to infer word meanings from surrounding context, although the relative efficacy of instruction in specific context clues versus simple practice in inferring meanings from context remains in question” (p. 774).
- **Morphemic analysis.** Another general strategy that has been identified for vocabulary instruction is training students in morphemic analysis, which is described as “a word identification strategy in which the meanings of words can be determined or inferred by examining their meaningful parts,” including root words, prefixes, and suffixes (Baumann et al., 2003, p. 773). In their review of research, Baumann and colleagues (2003) determined, “Although several studies suggest that instruction in morphological elements may not be fruitful (e.g., Freyd & Baron, 1982; Otterman, 1955), other, perhaps more methodologically and pedagogically sound, experiments suggest that such training may be effective. Specifically, it appears as though elementary and middle grade students can be taught specific morphemic elements (e.g., Graves & Hammond, 1980) and that they are able to spontaneously generalize (infer) the meaning of one word from a morphologically similar derivative (Wyssocki & Jenkins, 1987). . . . There is some indication that students can be taught specific morphemes (e.g., prefixes) that may enable them to unlock the meanings of unknown words containing these elements; also, there is some evidence that teaching students the meanings of unfamiliar words enables them to infer the meanings of morphologically related words” (p. 774).
- **Targeting of appropriate vocabulary words.** Several researchers have raised issues related to which specific words should be selected for direct vocabulary instruction.
  - Blachowicz and Fisher (2000) raised the concern that “the words chosen for instruction in commercial anthologies might be ones that many students already know” (p. 509, citing Ryder & Graves, 1994; Stallman et al., 1990).
  - Beck et al. (2002) identified “three things to keep in mind” in “evaluating words as possible candidates for instruction”: “How generally useful is the word? . . . How does the word relate to other words, to ideas that students know or have been learning? . . . What does the word bring to the text or situation?” (p. 29).
  - Beck and colleagues outlined a multitier system for classifying potential vocabulary words: “The first tier consists of the most basic words—clock, baby, happy, walk, and so on. Words in this tier rarely require instructional attention to their meanings in school. The third tier is made up of words whose frequency of use is quite low and often limited to specific domains. . . . The second tier contains words that are of high frequency for mature language users and are found across a variety of domains. Examples include coincidence, absurd, industrious, and fortunate. Because of the large role they play in a language user’s repertoire, rich knowledge of words in the second tier can have a powerful impact on verbal functioning. Thus, instruction directed toward Tier Two words can be most productive” (p. 8). Beck et al.’s tier model was described as a “promising approach” by Kamil (2003, p. 11).

- **Active student involvement.** Another principle identified by Blachowicz and Fisher (2000) was “That students should be active in developing their understanding of words and ways to learn them” (p. 504).
  - Similarly, Beck and colleagues (2002) identified “opportunities for students to interact with word meanings in ways that oblige them to think about what a word means” as a construct that helped students develop initial understandings of vocabulary words (p. 35).
- **Repeated exposures to words.** A third principle for guiding vocabulary instruction identified by Blachowicz and Fisher (2000) was “That students should build on multiple sources of information to learn words through repeated exposures” (Blachowicz & Fisher, 2000, p. 504).
  - Elaborating further on this principle, Blachowicz and Fisher (2000) wrote, “Stahl and Fairbanks’ meta-analysis (1986) concluded that methods that focus on providing students with multiple sources of information result in superior word learning. . . . Repeated exposures to a word can also be an important component of word learning. Stanley and Ginther (1991), working with sixth-grade students, supported earlier findings (Gipe, [1978–1979]; McKeown, 1985) that exposing a word in differing contexts facilitates word learning” (p. 508).
  - This finding connects to the National Reading Panel’s identification of “multiple, repeated exposures,” including “extended and rich instruction of vocabulary (applying words to multiple contexts, etc.),” as a characteristic of effective vocabulary instruction methods in the research they surveyed (NICHD, 2000, p. 4-22).
- **Vocabulary learning outside the classroom.** McKeown et al. (1985) found that fourth-grade students learned vocabulary better when they were motivated to look for targeted vocabulary words outside the classroom. Citing this result, Baumann et al. (2003) recommended that teachers should “Promote student use of vocabulary learned at school in nonschool contexts” (p. 778). Along similar lines, they recommended that teachers should “Provide students with activities that allow them to explore the richness and subtleties of word meanings in natural contexts” (p. 778, citing Scott, Butler, Asselin, & Henry, 1996).
- **Computer technology.** Multiple sources affirmed the value of computer technology for teaching vocabulary, particularly for struggling readers.
  - In describing the potential value of technology programs to “provide needed supports for struggling readers,” Reading Next stated, “For example, there are computer programs that help students improve . . . vocabulary” (Biancarosa & Snow, 2006, p. 19).
  - Kim and Kamil (2004) identified vocabulary assistance as one of the areas where “consistent interaction with computerized reading instruction . . . can help adolescents with reading and text comprehension” (p. 362).
  - The National Reading Panel (NRP) reported, “While the use of computer technology in reading is still in its infancy, the few studies reported in the literature suggest that this may be a powerful way of increasing vocabulary. . . . Two possibilities arise here. The first is that the computer might be used as an adjunct to direct vocabulary instruction. In this way, students could obtain more practice in learning vocabulary. A second possibility is that computer technology could bring to bear many different media. This is one way of adding a number of different modalities to the teaching of vocabulary and, consequently, helping ensure more effective vocabulary learning” (NICHD, 2000, p. 4-26, citing Reinking & Rickman, 1990; Heise et al., 1991; Davidson, Elcock, & Noyes, 1996; Heller, Sturmer, Funk, & Feezor, 1993). Two of the studies cited by NRP (Reinking & Rickman, 1990; Heise et al., 1991) included adolescent readers in their findings.
  - With regard specifically to use of multimedia in vocabulary instruction, Baumann et al.’s (2003) review of research on vocabulary instruction cited a third-grade study in which “Higgins and Cocks (1999) investigated incidental word learning with CD-ROM storybooks. Using a CD-ROM of Jack Prelutsky’s *The New Kid on the Block*, they charted students’ learning of six target words through the animation which was designed to illustrate words as students clicked on them. The mean gain was 3.43 words from pretest to posttest, and 40 percent of the students were able to define all six target words correctly after their reading of it in hypermedia” (p. 760). While this study represents a lower grade range than that served by Jamestown Reading Navigator, it suggests the potential of computer animation for helping teach vocabulary words.

- **Assessment.** Based on the variety of measures used to assess student vocabulary and the different results those measures can achieve, the National Reading Panel recommended that vocabulary should be assessed in multiple ways in the classroom. In particular, they argued that “the more closely the assessment matches the instructional context, the more appropriate the conclusions about the instruction will be” (NICHHD, 2000, p. 4-26).

### Specific Strategies

- **Preteaching vocabulary.** Based on their review of the research literature, Baumann et al. (2003) recommended, “Preteach critical vocabulary necessary to comprehend selections students read in basal readers and in content area textbooks” (Baumann et al., 2003, p. 778).
  - *This strategy was also recommended by the National Reading Panel review of vocabulary research. The NRP recommended direct instruction in “vocabulary items that are required for a specific text to be read as part of the lesson” (NICHHD, 2000, pp. 4-24–4-25, citing four studies).<sup>3</sup> This included pre-instruction of vocabulary before the reading or lesson (p. 4-25, citing three studies).<sup>4</sup>*
- **Introducing word meanings in context.** In contrast with the strategy of preteaching vocabulary, Beck et al. (2002) recommended, “[I]f the word is likely to affect comprehension of the story, then the most effective place to introduce word meanings may be at the moment the word is met in the text. . . . [E]ven if students have been introduced to a word’s meaning before reading, their memory for a newly introduced word meaning may still be rather tentative, making it difficult to bring that meaning into the text” (pp. 42–43). This suggests a value to either teaching students new words in context, when students first encounter them, or reminding students of previously taught word meanings when they encounter them in context.
- **Student-friendly explanations of new words.** One of the elements Beck and colleagues (2002) identified in the success of their instructional strategy with fourth-grade students was “student-friendly explanations of words,” which they characterized as incorporating “two basic principles . . . : (1) Characterize the word and how it is typically used. (2) Explain the meaning in everyday language” (p. 35).
- **Instructional contexts for vocabulary words.** Another element Beck et al. (2002) recommended for introducing new words was providing an instructional context. Instructional contexts were described as differing from natural contexts in that the instructional context is deliberately constructed so that students can derive the correct meaning of the word from the context (p. 39). In other words, the surrounding words are deliberately designed to help students clarify the meaning of the new word.
- **Semantic mapping.** Semantic mapping was identified by Baumann et al. (2003) as a specific research-supported vocabulary instruction strategy that “organizes words related to a core concept into meaningful clusters” (p. 766).
  - *Typically, it involves “[1] Selecting a key or central word from a reading selection about which the teacher can assume that the students have some familiarity. [2] Having the students free associate on the core word and generate a list of related words. [3] Organizing the words into categories (and perhaps labeling them). [4] Discussing alternate ways of categorizing the words, adding new words, and forming new categories” (Baumann et al., 2003, p. 766).*
  - *Baumann et al. (2003) found that “in the majority of studies . . . semantic mapping . . . appear[s] to be [an] effective strateg[y] for teaching students the meanings of new words that lie within a semantically related category [with] which students are familiar. In addition, there is evidence that [this technique] also promote[s] passage comprehension and [is] effective with learners of diverse ages, ethnic backgrounds, and reading abilities” (Baumann et al., 2003, p. 767).*

3 Tomesen & Aarnoutse, 1998; White, Graves, & Slater, 1990; Dole, Sloan, & Trathen, 1995; Rinaldi, Sells, & McLaughlin, 1997.

4 Brett, Rothlein, & Hurley, 1996; Wixson, 1986; Carney, Anderson, Blackburn, & Blessing, 1984.

- **Visual support for word learning.** Describing the needs of adolescent English language learners, Short and Fitzsimmons (2007) identified several strategies that provide some form of visual support for vocabulary learning: “Students can learn new words through a variety of methods. Visuals, graphic organizers, [and] demonstrations . . . can help students better understand and remember words and their meanings” (p. 35).
- **Reciprocal peer tutoring.** The National Reading Panel reviewed a research study in which reciprocal peer tutoring was compared to traditional vocabulary instruction. The study found that “The 7th and 8th grade students in the reciprocal peer-tutoring group had significantly higher scores on weekly vocabulary quizzes” (NICHHD, 2000, p. 4-23, citing Malone & McLaughlin, 1997).
  - *Along similar lines, Peterson et al. (2000) stated, “Opportunities for social interaction can help struggling second language learners acquire linguistic knowledge of English” (p. 14).*
- **Oral and written composition.** Based on their research review, Baumann et al. (2003) recommended, “Engage students in oral and written composition on a regular and sustained basis. Have students express themselves in writing and speech daily. Generative processes must be used and exercised if receptive vocabulary is to become expressive” (p. 778).
  - *Along similar lines, Blachowicz and Fisher (2000) stated, “For retention and usage, student manipulation of words in many contexts seems to be critical. We cite . . . Stahl and Vancil’s study (1986), which highlights the importance of discussion in learning and retention of new [content-area] vocabulary” (p. 513).*
  - *Baumann et al. (2003) reviewed one study in particular that showed the potential for writing as part of rich vocabulary instruction: “Duin and Graves (1987) explored the impact instruction in a set of semantically related words has on essay writing. Seventh-grade students were taught 13 target words over 6 days according to one of three methods: (a) intensive vocabulary and writing instruction (similar to the McKeown et al., 1985, extended rich instruction, but it included many writing activities), (b) intensive vocabulary alone (same as intensive vocabulary and writing, but no writing activities were included), or (c) traditional vocabulary instruction (worksheet/definition activities). As measured by a multiple-choice vocabulary knowledge test, an analysis of the students’ use of target words in essays, and holistic analyses of the essays, the vocabulary and writing group consistently outperformed the other two groups, and the vocabulary alone group outperformed the traditional vocabulary group. The authors concluded that teaching a set of related words to students before they write not only results in students learning the meanings of those words but also improves the quality of their essays” (Baumann et al., 2003, p. 769).*
  - *Similarly, the authors of the Writing Next report claimed, “Using writing tasks to learn content offers students opportunities to expand their knowledge of vocabulary” (Graham & Perin, 2007, p. 23).*

**How *Jamestown Reading Navigator* Aligns with Instructional Recommendations for Teaching Vocabulary**

The following table describes how *Jamestown Reading Navigator* aligns with instructional recommendations described above for teaching vocabulary.

Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Vocabulary instruction should be planned, systematic, and sustained, based on specific learning goals for students.</p>	<p><i>Jamestown Reading Navigator's</i> approach to vocabulary instruction is planned, systematic, and sustained, directed toward goals that are appropriate for struggling readers.</p> <ul style="list-style-type: none"> <li>• Each online journey (lesson) provides direct instruction on targeted vocabulary words.</li> <li>• In Trek 1 (level 1), targeted vocabulary words consist of five common sight words during each journey. Over the course of the trek, students learn 100 common “instant words” that must be recognized by sight since the words do not feature phonemic sound-spelling correspondences.</li> <li>• Students in each journey in Trek 1 are also introduced to 10 “word family” words, in two groups of five—typically related to two word families. Additionally, supplemental words and their meanings are introduced to help students transfer their word family knowledge.</li> <li>• In each journey during Treks 2–4, students are introduced to eight target vocabulary words that are used in the text selection for that journey. These words were selected on the basis of general usefulness for reading academic text, importance for understanding the text selection, and recurrence in subsequent journeys within the quest (unit).</li> <li>• Over the course of <i>Jamestown Reading Navigator</i>, students are introduced to approximately 390 words in Trek 1, 260 words each in Treks 2 and 3, and 130 words in Trek 4.</li> </ul>
<p>Students should read extensively to develop vocabulary knowledge.</p>	<p><i>Jamestown Reading Navigator</i> includes both online text selections for students to read and print materials that are recommended for assigned or independent reading. These texts are carefully selected to present vocabulary that is relevant and useful, considering students' current reading levels.</p>
<p>English language learning students should have the opportunity to listen to spoken text while following along with printed text.</p>	<p>Teachers can choose to make audio support available for the online reading selection in each journey, allowing students to read along while listening to text. Audio recordings are also available for the <i>inClass Reader</i> selections. Additionally, extensive audio support is provided for key instruction, reading tips, and directions in <i>Jamestown Reading Navigator</i>, providing further opportunities for students to experience text both visually and auditorily.</p>

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Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Students should be exposed to a word-rich environment in which students are immersed in words, including fun word play and games.</p>	<ul style="list-style-type: none"> <li>• Student reading of online and print texts exposes students to a wide range of potential vocabulary words, including but not limited to words that are directly taught within the program.</li> <li>• Within the online program, activities such as semantic mapping involve student interaction with a variety of words, not just targeted vocabulary.</li> <li>• The online professional development module on Vocabulary provides teachers with guidance in creating a “word-rich” environment for students. In this environment, students create their own vocabulary word cards (with categories for part of speech, definition, antonyms, synonyms, and related words) and then use the information on the cards to complete a variety of activities: e.g., helping another student guess what the word is; playing games such as “Read My Mind”; making a skit using three vocabulary words; and miming a word. While the focus of these activities relates primarily to targeted vocabulary words from the online program, activities also involve student interaction with other related words (e.g., synonyms and antonyms).</li> <li>• An on-site professional development session, Vocabulary Strategies That Motivate, helps teachers learn strategies to help students internalize new word meaning and build conceptual knowledge by providing a word-rich environment. In this session, teachers explore activities that expand word knowledge and build concept knowledge through games, manipulatives, graphic organizers, word sorts, and word walls, both in relation to targeted vocabulary within the online program and for additional vocabulary words.</li> </ul>
<p>Students should be taught to analyze word meanings based on context.</p>	<p>Two online journeys in <i>Jamestown Reading Navigator</i> (one each in Treks 2 and 3) focus on teaching students to analyze the meaning of words from context. Additional suggestions and materials for teaching this skill are provided to teachers in the <i>Reteaching Skills Support</i> materials.</p>
<p>Students should be taught to identify word meanings by analyzing morphemes.</p>	<p><i>Jamestown Reading Navigator</i> teacher support materials and professional development for teachers provide some suggestions for teaching morphemic analysis.</p> <ul style="list-style-type: none"> <li>• The <i>Teacher Resource Guide</i> section on Enriching Vocabulary includes the recommendation to “Point out connections between words, such as common prefixes, suffixes, roots, or words with similar meanings.”</li> <li>• Lesson plans include some vocabulary activities that teach morphemic analysis, such as “Tell students that the prefix <i>dis-</i> means ‘opposite.’ Ask them what <i>disagree</i> means.”</li> <li>• An optional on-site training session on Developing Academic Vocabulary includes morphemic analysis among strategies that are taught to teachers.</li> </ul>

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## ANALYSIS AND RESULTS

Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Vocabulary words that are selected for direct instruction should be words that will be useful to students and that students are not likely to know.</p>	<ul style="list-style-type: none"> <li>• Vocabulary words identified for instruction in Treks 2–4 represent words that are high frequency for mature language users and are found across a variety of domains (i.e., Tier 2 words, using Beck et al.’s [2002] classification scheme). All of them are important in the text selections students are reading and analyzing.</li> <li>• Vocabulary words were selected partly on the basis of frequency of occurrence in academic language, as reflected on the Academic Word List (Coxhead, n. d.).</li> <li>• Vocabulary words are generally one to two years above the readability level of the selection, based on the Harris-Jacobson word list (Harris &amp; Jacobson, 1982). This provides a high likelihood that students may not already have a firm understanding of the words.</li> <li>• Both the online Vocabulary professional development module and an on-site professional development session on developing academic vocabulary include guidance for teachers on identifying words from specific tiers, using Beck et al.’s (2002) scheme. This can be used to help teachers identify additional words that might be worth teaching to students.</li> </ul>
<p>Direct instruction in vocabulary should include words that will help students process content-area texts.</p>	<ul style="list-style-type: none"> <li>• Target words for vocabulary instruction in Treks 2–4 include words that are critical for understanding the text selection that is the focus of each journey’s reading. Since many of these text selections are content-area texts, instruction in vocabulary words includes a sizable component of words that are particularly useful in reading content-area texts.</li> <li>• An optional on-site professional development session on developing academic vocabulary focuses on helping students develop transferable vocabulary learning strategies and on helping teachers—including content-area teachers—utilize strategies to help students learn specific academic vocabulary.</li> </ul>

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Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Students should be actively involved in learning word meanings, including activities that require them to think about the meanings of the words.</p>	<p><i>Jamestown Reading Navigator</i> actively involves students in learning vocabulary words in a variety of ways.</p> <ul style="list-style-type: none"> <li>• Students complete interactive activities as part of their initial learning of sight words and word family words (Trek 1) and targeted vocabulary words (Trek 2–4).</li> <li>• Students in Treks 2–4 are prompted to enter information on vocabulary word cards when vocabulary words are first introduced during the pre-reading vocabulary activity. The word cards are saved in the Vocabulary Journal, which students can access while reading the selection by clicking on hyperlinked vocabulary words. Students are encouraged to add personalized information to the word cards (e.g., sample uses of the vocabulary word in context).</li> <li>• Students in Treks 2–4 complete assessments of their vocabulary knowledge as part of each Journey Test.</li> <li>• If students do not do well on the Journey Test questions related to vocabulary, they complete additional activities to strengthen their knowledge and demonstrate their understanding of the words by answering yes/no questions, completing cloze activities, or matching vocabulary words via drag-and-drop with definitions, examples, or characteristics. If students still do not perform well, they are targeted for off-computer active vocabulary learning activities.</li> <li>• Students are assigned vocabulary words to use in their writing assignments for each journey in all treks.</li> <li>• The <i>Teacher Resource Guide</i> section on Enriching Vocabulary includes a variety of activity suggestions for providing students with additional activities to develop vocabulary knowledge. For example, teachers are encouraged to have students create graphic organizers of vocabulary words.</li> <li>• Additional vocabulary activities are suggested in the lesson plans for each journey in Treks 2–4.</li> <li>• As described above, both the online professional development module on Vocabulary and optional on-site professional development sessions focusing on vocabulary topics provide a variety of strategies for getting students actively involved in learning vocabulary words.</li> </ul>

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Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Students should be exposed to vocabulary words multiple times, from multiple sources.</p>	<p>In <i>Jamestown Reading Navigator</i> Treks 2–4, students typically encounter targeted vocabulary words up to 15 times or more. Exposures to targeted vocabulary words include:</p> <ul style="list-style-type: none"> <li>• The initial vocabulary word list</li> <li>• The vocabulary word cards, which are accessible when vocabulary is initially taught, later in the journey (e.g., as students are reading the text selection), and elsewhere in the program as well</li> <li>• The Quick Match activity, which requires students to match the words with definitions, synonyms, antonyms, or characteristics of the words</li> <li>• At least twice in a reading selection, where the words are hyperlinked to the personalized word cards</li> <li>• Revisiting the word cards as a review activity, with a new yes/no question to which students respond</li> <li>• The Journey Test</li> <li>• The Look Back at Vocabulary review activity, for students who do not do well in the Journey Test. This activity includes animation about each word and a quick quiz of vocabulary words.</li> <li>• The journey writing assignment, which requires students to use at least two vocabulary words. The vocabulary word list is accessible during each step in the writing process.</li> <li>• The quest writing assignment, which requires students to use at least three vocabulary words from the journey text selections they read during the quest. The vocabulary word list is accessible during each step in the writing process.</li> <li>• Fluency passages for listening and oral reading that contain some of the vocabulary words</li> <li>• The Quest Test, which assesses some of the words</li> </ul> <p>In addition:</p> <ul style="list-style-type: none"> <li>• Many vocabulary words also reappear in subsequent text selections.</li> <li>• The <i>Teacher Resource Guide</i> section on Improving Vocabulary includes a variety of strategies and suggested activities for increasing the number and range of student encounters with words.</li> <li>• Additional vocabulary activities are suggested in the lesson plan vocabulary activity for each journey.</li> </ul>
<p>Vocabulary learning should extend beyond the classroom.</p>	<ul style="list-style-type: none"> <li>• The Enriching Vocabulary section of the <i>Teacher Resource Guide</i> includes several recommendations that can help teachers extend vocabulary learning outside the classroom. Examples include: <ul style="list-style-type: none"> <li>– “Designate a bulletin board for political cartoons, comic strips, quotes, or words cut from magazines or newspapers related to new vocabulary.” This can serve as a starting point for students to collect instances of vocabulary word usages from outside the classroom.</li> <li>– Provide “experiences that enhance the meaning of words, such as class discussions or field trips.”</li> </ul> </li> <li>• The on-site professional development session Vocabulary Strategies That Motivate provides teachers with suggestions for encouraging students to extend their learning of new words outside the classroom.</li> </ul>

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Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Computer technology should be used to help students learn vocabulary, including opportunities for practice and use of multimedia.</p>	<p>Computer technology is the basis of <i>Jamestown Reading Navigator's</i> approach to teaching vocabulary, as described throughout this table. Computerized features that are used to help students learn vocabulary in Trek 1 include the following:</p> <ul style="list-style-type: none"> <li>• Within each journey, students practice recognizing and using sight words in an interactive exercise. For example, students may see a sentence on screen and be instructed to click on the sight word that is spoken, or to insert the sight word into the appropriate sentence. Every introduction of vocabulary words in Trek 1 includes oral pronunciation of the words.</li> <li>• Three times in a journey, students listen to and read a poem, with animated illustrations, that contains sight words and word family words.</li> <li>• Students practice word family words in a variety of interactive formats, with immediate feedback to reinforce understanding. Students complete two activities for each word family and then complete activities combining words from both word families.             <ul style="list-style-type: none"> <li>– Students first gain familiarity with the words by typing initial letter/letters based on the audio recording of the word.</li> <li>– Students then practice inserting the words into the appropriate sentences (either by clicking or typing).</li> </ul> </li> <li>• Students practice recognizing supplemental words in an interactive format by matching the words to the appropriate picture.</li> <li>• Students complete scored review activities with immediate feedback covering both sight words and word family words. If students fail the assessments, teachers are alerted in the Learner Management System. Students' reports indicate whether they require sight words intervention, word family intervention, or both.</li> </ul> <p>Computerized features that are used to help students learn vocabulary in Treks 2–4 include the following:</p> <ul style="list-style-type: none"> <li>• Each vocabulary word is pronounced orally, and students are taught the meanings of the words and given a sample sentence.</li> <li>• Students complete a Quick Match interactive activity that reinforces meanings of the words.</li> <li>• A My Notes section provides a place for students to add memory aids, associations, sample sentences, etc., to create a personalized “word card” for each word. Students' word cards and notes are saved in their personal Vocabulary Journal for access elsewhere in the program.</li> <li>• Within the text selection, vocabulary words are hyperlinked to their associated word cards. Students can add or modify their notes on the word cards as they read the selection.</li> <li>• Students who do poorly on an assessment of vocabulary knowledge within a journey view a Look Back at Vocabulary section that features flash animation to reteach the meaning of vocabulary words. If further reteaching is needed, the program alerts teachers through the Learner Management System reports.</li> </ul>

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Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
<p>Students' vocabulary learning should be regularly assessed in multiple ways, including ways closely matched to the instructional context.</p>	<p>Students' vocabulary learning is assessed in several ways in <i>Jamestown Reading Navigator</i>, which match the ways that vocabulary is taught in the program. These include</p> <ul style="list-style-type: none"> <li>• Quick Match drag-and-drop activities, which test a variety of word features including definitions, synonyms, antonyms, and characteristics</li> <li>• Yes/no questions</li> <li>• Embedded multiple choice comprehension questions in the Journey Tests and Quest Tests</li> <li>• Cloze statements where a student is asked to complete a series of sentences by inserting one selection vocabulary word into a blank space in a statement</li> </ul>
<p>Preteaching critical vocabulary can help students understand instructional text passages.</p>	<p><i>Jamestown Reading Navigator</i> preteaches critical vocabulary from text selections before students encounter the vocabulary in their reading.</p>
<p>Students should either be taught new words in context or reminded of word meanings when they encounter them in context.</p>	<p>Within the text selections in <i>Jamestown Reading Navigator</i>, the vocabulary words are hyperlinked to the word cards students have already viewed, so that students are provided with the definition, sample sentence, and characteristics of the word at the point of use.</p>
<p>Student-friendly explanations should be provided for new vocabulary words.</p>	<p>Explanations of new words in <i>Jamestown Reading Navigator</i> are student friendly.</p> <ul style="list-style-type: none"> <li>• The word cards use everyday-language definitions and sample sentences that characterize the word and explain how it is typically used.</li> <li>• The Look Back at Vocabulary animations for reteaching vocabulary if needed are student friendly and often humorous.</li> <li>• Additionally, the online dictionary provides student-friendly definitions for many words that are not targeted vocabulary words.</li> </ul>
<p>Instructional contexts should be provided for new vocabulary words.</p>	<p>Most of the sample sentences on the word cards constitute instructional contexts that make it easy for students to deduce the word meaning: e.g., "A bionic leg takes the place of a real leg."</p>
<p>Semantic mapping can help students develop in-depth knowledge of vocabulary words.</p>	<p>One of the common prereading vocabulary activities in <i>Jamestown Reading Navigator</i> is having students use semantic mapping to complete a word web. In this activity, students are given a topic and a list of words that are used in the selection, which may include a combination of vocabulary words and other words that are probably already familiar to students. Students must categorize the words by topic. The word web helps students explore meanings, associations, and relationships about a concept or a topic related to the selection. While this activity is designed primarily as a prereading comprehension exercise, it can also help students develop more in-depth knowledge of targeted vocabulary words and other words they will encounter in the journey text selection.</p>

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Summary of Vocabulary Recommendations	Application Through <i>Jamestown Reading Navigator</i>
Instruction should provide visual support for word learning, such as visuals, graphic organizers, and demonstrations.	<p><i>Jamestown Reading Navigator</i></p> <ul style="list-style-type: none"> <li>• Uses visuals and animation to reteach and reinforce the meanings of vocabulary words</li> <li>• Incorporates a broad array of graphic organizers, with suggestions to teachers for having students learn them as part of vocabulary instruction</li> <li>• Includes demonstrations of the meanings of vocabulary words</li> <li>• Provides an online dictionary with visual support for many words that are not targeted vocabulary words. Students type in the word and see the word, its definition, and a visual.</li> </ul>
Reciprocal peer tutoring can be an effective method for vocabulary instruction.	The lesson plans that are provided with <i>Jamestown Reading Navigator</i> often suggest that students work with a partner to study vocabulary words. Similarly, the <i>Teacher Resource Guide</i> section on Enriching Vocabulary encourages teachers to have peers work together to learn vocabulary words.
Students should engage in oral and written composition that uses vocabulary words.	<ul style="list-style-type: none"> <li>• Journey writing assignments require students to use at least two of the vocabulary words from that journey. Students see the list of vocabulary words as part of the planning step for the writing.</li> <li>• Quest writing assignments require that students use at least three vocabulary words from the journey text selections they read during the quest. Students see the list of vocabulary words as part of the planning step for the writing.</li> <li>• Lesson plans often include discussion activities in which students will typically use vocabulary words in a context of oral composition.</li> </ul>

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