Effective content vocabulary instruction in the middle: Matching students, purposes, words, and strategies

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It is possible to include good vocabulary instruction in middle school content area classrooms. These authors suggest some ways to do so.

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It's a typical Monday in Bob Hancock's seventh-grade civics class as he introduces the vocabulary for the week's chapter on citizenship. (All teacher and student names are pseudonyms.) Bob, a 10-year teaching veteran, writes the following six terms on the board: *naturalization, citizen, deport, government, illegal alien,* and *legal alien.* As they do every Monday, his seventh graders begin looking up the words in the textbook glossary and writing the definitions in their notebooks. After about 15 minutes, when most have copied the definitions, Bob begins to quiz the students about the words' meanings. Only a handful of students raise their hands to answer his questions. It quickly becomes obvious that many students possess, at best, only a superficial understanding of the concepts. When asked to define *deport*, Cassandra, a normally outgoing student, almost whispers the glossary definition: "to ex, ex, ex-pel from a country." Bob asks Cassandra what she thinks *expel* means. Cassandra doesn't answer and looks back at her book. After a few seconds of awkward silence, Bob explains to the class that *expel* means to "throw out" and asks if someone can use *expel* in a sentence. A student in the front row raises his hand and says, "The President expelled the first pitch at the season opener of the Washington Nationals baseball game." Twenty-five minutes into the 50-minute period, Bob begins to read the chapter with his class.

Afterward, Bob confesses, "I know that they're not learning the words. Or not learning them well enough. The glossary definitions aren't enough. Some might learn them short term, but they don't remember them six weeks, or even six hours, later. The ones they do remember are the ones that keep coming up. That's why they remember them. But with the state proficiency tests, I've got a lot to cover. I can't spend a lot of time using all of those vocabulary strategies I've learned in workshops, like concept mapping. I'd like to, but I can't do them with every single vocabulary term I've got to cover—they take way too much time.... This year, I'm going to start teaching fewer words so I can spend more time on the important ones, but I'm not sure if what I think is an important vocabulary word is really that important."

Unfortunately, Bob's dilemma is all too common for many of the content teachers we have worked with over the years. In fact, while preparing their chapter on vocabulary instruction for the *Handbook of Reading Research*, Vol. 3, Blachowicz and Fisher (2000) asked a number of vocabulary researchers the following question:

How much has the research on vocabulary instruction affected classroom practice? Their answer was a disturbing and disappointed "not much" (p. 509). Thus, despite the great amount we have learned about effective vocabulary instruction over the last few decades, and despite the fact that many teachers cite vocabulary instruction as an important instructional component (Cassidy & Cassidy, 2005/2006), it appears that teachers do not always incorporate best practices into their own instruction.

Why is this so? It would be easy, and misleading, to blame teachers. Research findings do not always translate easily to practice. As former teachers who tried to apply research findings to everyday practice, we often found that the devil was in the details. Although we were well versed in the general instructional recommendations of vocabulary research (e.g., actively engage the students in word learning, immerse the students in words repeatedly across a wide variety of contexts, help students personalize word learning, guide students in building relationships among related concepts), we found that our problems were often not general in nature, but much more specific to our content, our students, and our instructional purposes. Which words should we choose to teach for a particular lesson? Were there words we could skip directly teaching? What did this particular group of students already know about particular concepts? How deeply did our students need to explore each of the words? What, specifically, did we want the students to know about each word? How much time should we spend teaching each concept? Which strategies should we use to teach each word—Semantic Feature Analysis? Concept Mapping?

In short, although the research on vocabulary instruction provided us with useful general principles and methods, we had no useful framework to help us answer these more specific "where the rubber meets the road" questions. Blachowicz and Fisher made the same point—when teachers attempt to apply the general research findings of vocabulary instruction to specific classroom con-

texts, "teaching vocabulary becomes not a simple process of teaching words but one of teaching particular words to particular students for a particular purpose" (2000, p. 517). When working with content area teachers, we have wrestled with the same issue. General principles of vocabulary instruction, although helpful, are often not sufficient to help content area teachers make the leap from theory to practice. What we needed was an instructional framework specifically tailored to content area vocabulary instruction, a framework that would help content teachers bridge theory and practice. In the next section, we propose a framework that guides content teachers in choosing vocabulary words and methods that match their students and their purposes.

Making the match: Students, purposes, words, and strategies

In content vocabulary instruction, we believe that there are at least four factors to keep in mind when making instructional decisions: the *students* we are teaching, the nature of the *words* we decide to teach, our instructional *purposes* in teaching each of those words, and the *strategies* we employ to teach the words. In Figure 1, we have placed the students at the confluence of these other three factors to highlight the importance of taking into account our students' characteristics and prior knowledge when making instructional decisions. As teachers weigh these four factors, they must always keep an eye on time costs in planning and instruction. In the next section, we will describe how teachers can balance these factors in a workable and sensible manner.

The four-level framework: All words are not created equal

Too often, we have observed lessons in which all content words were treated equally: All words were taught in the same manner (copy the

Figure 1
Making the match in vocabulary instruction: Students, purposes, words, and strategies.
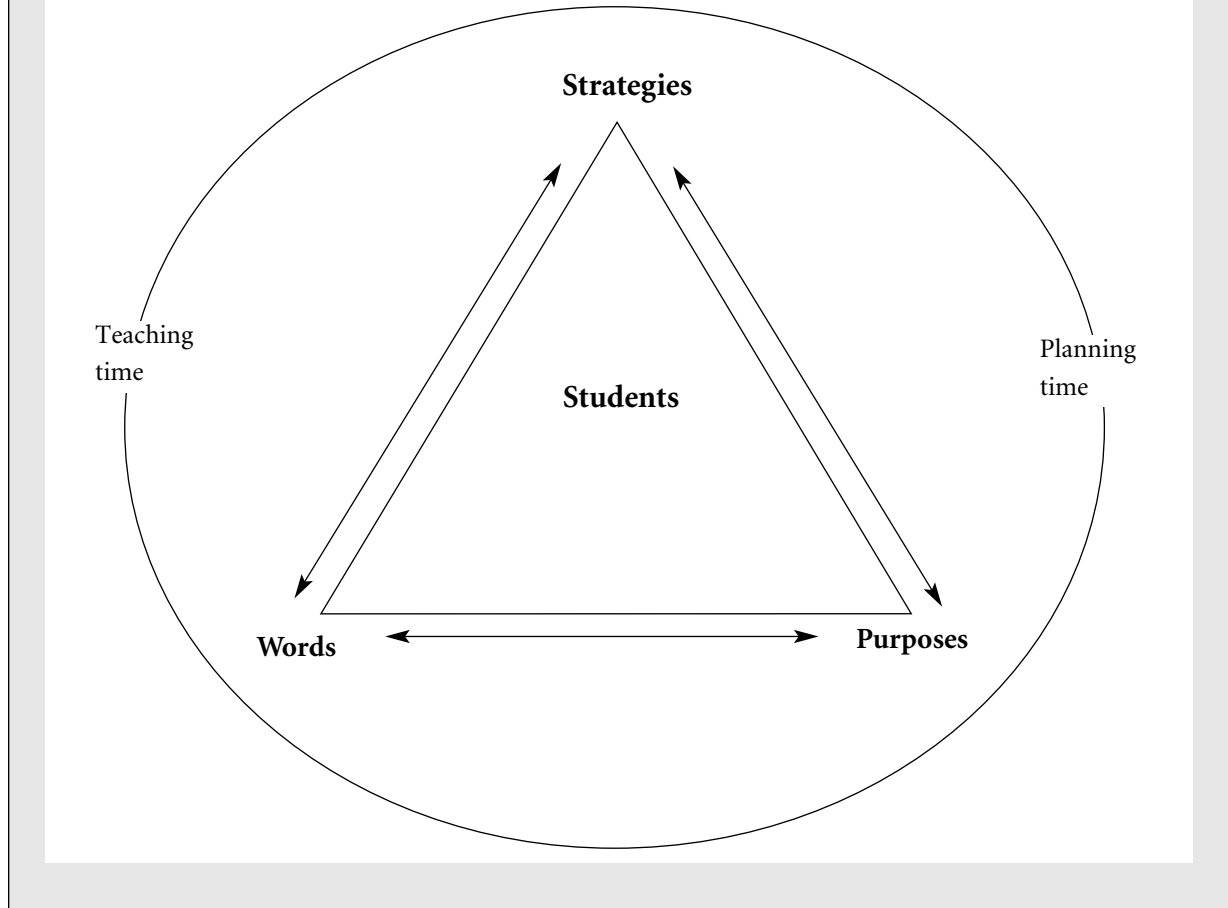
definitions and write them in a sentence), taught at the same place in the lesson (before reading), and allotted the same amount of instructional time (seven words taught in 20 minutes, approximately 3 minutes per word). This "one size fits all" treatment is too often employed regardless of the students' prior conceptual knowledge, the goals of the lesson, or the nature of the words themselves.

In an effort to help teachers think more systematically about vocabulary instruction, some researchers have proposed methods for profitably organizing and categorizing words for teaching (see Beck, McKeown, & Kucan, 2002; Graves,

1984; Graves & Prenn, 1986; Stahl & Nagy, 2006). One method that is currently popular and that we have found very effective is Beck, McKeown, and Kucan's (2002) system, in which words are categorized according to three tiers. Tier one words are basic words that probably don't require instruction for native language speakers (e.g., *friend* and *run*). Tier two words are high-frequency, high-utility words for mature language users (e.g., *redundant*, *scathing*, *justify*). Tier three includes low-frequency words usually found, and best learned, in content areas (e.g., *ecosystem*, *Emancipation Proclamation*, *The Code of*

Hammurabi). Beck and her colleagues (2002) wisely advocated spending most vocabulary instructional time on tier two words.

Although we have used and highly recommend the three-tier system, we have found in our work with middle school content teachers that they need something more specific for content vocabulary. They need a system specifically designed to help them organize, categorize, and prioritize the many types of content words they must teach, generally categorized as tier three words in Beck, McKeown, and Kucan's model (2002). The system we propose in this article builds on the three-tier system, taking into account the goals of the lesson, the amount of teaching time and depth of knowledge a word would require, and when in the lesson it would be most profitable to explore the word. With these issues in mind, we devised the "four-level framework" as a content area teacher's extension to the three-tier system. Our model is based partially on Graves's (1984; 2000) and McKeown and Beck's (1988) work. In this framework, outlined in Figure 2*,* we have categorized words in the following way:

- Critical "before" words (Level 1)
- "Foot-in-the-door" words (Level 2)
- Critical "after" words (Level 3)
- Words not to teach (Level 4)

Level 1 (critical "before" words)

Level 1 words are words that meet the following criteria:

- They are absolutely essential to understanding the passage
- They represent concepts of which students need an *in-depth* understanding *before reading* to successfully navigate the passage and construct meaning

Teachers must be willing and able to devote 15–20 minutes or more (sometimes much more)

to explicitly teach and guide students toward understanding the concepts before reading. These words are few in number and represent new concepts or known concepts that need to be developed much more fully and broadly. Examples from science and social studies might include *photosynthesis*, *ecosystem*, *separation of powers*, and *civil rights movement*.

Level 2 ("foot-in-the-door" words)

Like Level 1 words, Level 2 words are also critical to understanding the text; however, students only need a basic, "foot-in-the-door" understanding of these words to successfully get the gist of a passage. Like Level 1 words, these "foot-in-the-door" words should be few in number and need to be dealt with up front. However, in contrast to Level 1 words, these words require only a short amount of instructional time. We identify two subtypes of "foot-in-the-door" words:

- New label/new concept words. For new Level 2 words that represent unfamiliar concepts, we have found that simply providing the students with a clear definition of the word and a sentence with rich surrounding context is usually enough (see Graves, Juel, & Graves, 2004). For example, before reading a social studies chapter on settling the Great Plains, the students may only need to know that a *homesteader* is one who settled on free land provided by the government. The teacher can go into more depth about *homesteaders* after the reading if warranted.
- New words/familiar concepts. For new words that represent familiar concepts, simply providing the synonym or definition for the word often accomplishes the job. In a passage about the life cycle of a butterfly, the students may only need to understand that the word *metamorphosis* means "to change in form." Later, after reading, the class can explore this word more deeply as needed or as time warrants.

Figure 2
The four-level framework
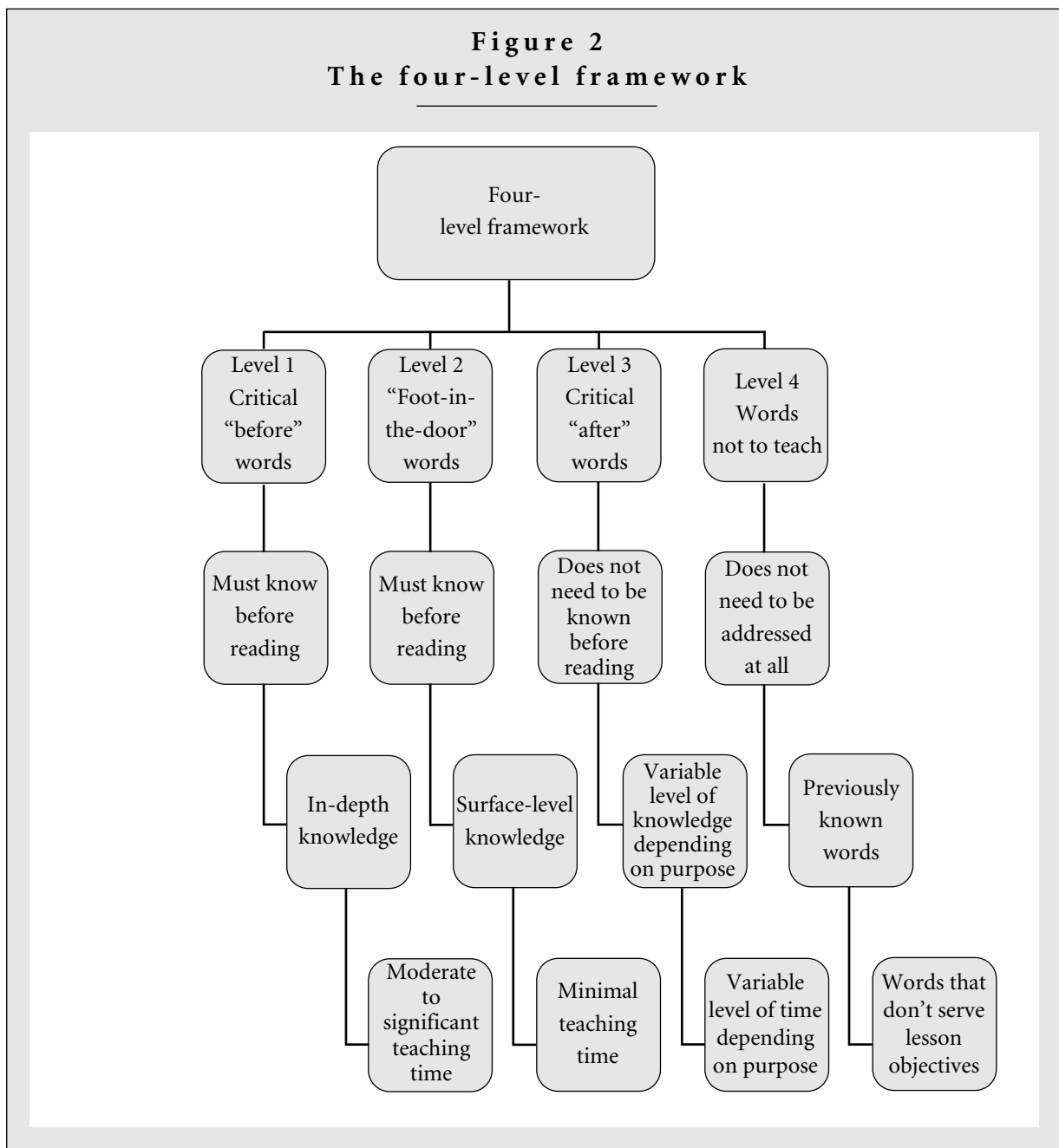
Level 3 (critical "after" words)

Level 3 words represent concepts that the teacher decides are important for the student to know on some level; however, the student does not have to necessarily understand them before reading to successfully construct meaning from the reading. These words can be dealt with during reading

(particularly if reading the passage together with a small group as a class) or after the reading. Level 3 words fall into the following four categories:

• Content words that don't need to be fully understood before reading to get the gist of the passage, but that can be addressed afterward.

- Content words that are defined clearly and explicitly in the text. (For example, *veto* is defined clearly in one social studies text as to "refuse to sign"; in a science passage on weather *fog* is clearly defined, in context, as a cloud at ground level). Again, these words can be discussed more deeply, beyond the textbook definition, after reading.

- High-utility words that a student will likely see in other settings—in other texts, in other academic disciplines, or in life (e.g., *plague*, *fugitive*, *serene*).

- Words that can be used to teach "preciseness of language" (e.g., the author uses the word *lope* instead of *run*).
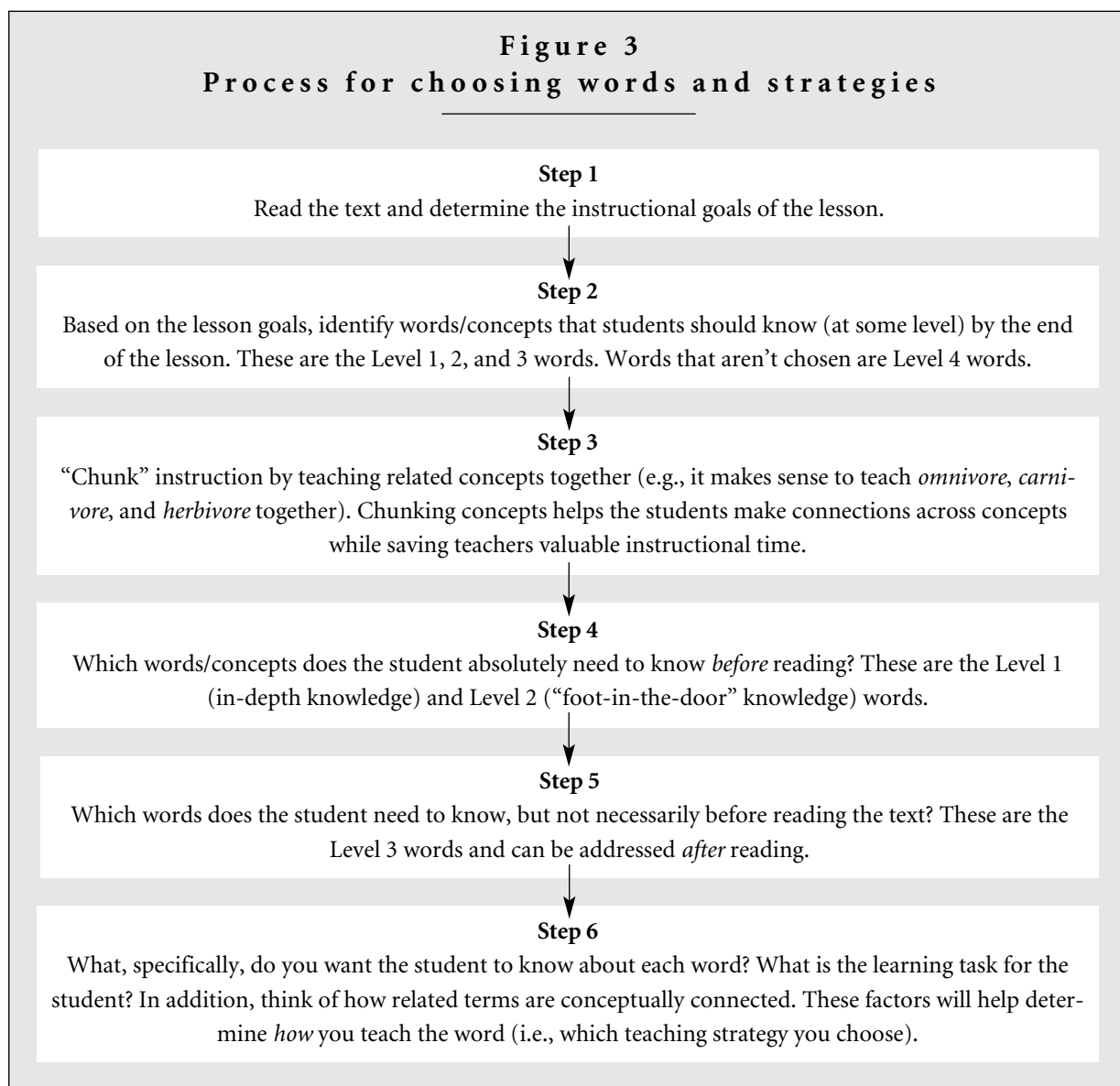
Level 4 (words not to teach)

Just as important as knowing which words to choose, a teacher should know on which words not to spend valuable planning and instructional time. Characteristics of Level 4 words include the following:

- Words the students probably already know. Although this may seem obvious, we are surprised at the words identified by publishers as critical in some texts (e.g., in one literature basal we found *mustache*, *fault*, and *gym* identified as vocabulary words deemed worthy of direct instruction). We realize that these Level 4 words vary depending on each student's background and needs (e.g., an English-Language Learner may need to spend time on words that a native language speaker already knows).

- Words that do not serve the teacher's instructional goal. Sometimes our instructional goals may differ from the textbook author's goals. If so, the teacher should not feel constrained to spend instructional time on key terms that are highlighted in the textbook, but that do not serve the goals of his or her lesson.

- Words with rich surrounding context from which the student can infer the meaning. For example, in one U.S. history textbook, *antebellum* was briefly defined as "before the Civil War." This was all the reader needed to know about this word to understand the sentence and the larger concepts in the passage. In the same textbook, *religious revival* was described in such clear and rich detail that it could stand alone without much additional instruction. (S. Kletzien, personal communication, November 2005)

A process for choosing, organizing, and prioritizing the words

With the four levels of words in mind, the following process provides teachers with a set of steps to follow when choosing vocabulary for instruction. This process should not be taken as a strict sequence that must be followed rigidly; it is better viewed as a recipe that can be modified by an experienced chef to fit the tastes and needs of the customers. An outline of the process is shown in Figure 3.

- Read the passage and determine the instructional goals of the lesson (again, these may differ from the stated goals of the textbook author). Note that a word is only "important" in relation to the goals of the lesson; without instructional goals to guide decision making, all words appear equally important.

- Bearing in mind the lesson goals, identify words or concepts that students should know (at some level) by the end of the lesson. These are the Level 1, 2, and 3 words. Words that aren't chosen are Level 4 words.

- Identify the connections and relationships between the words or concepts you have decided to directly teach. "Chunk" instruction

Figure 3
Process for choosing words and strategies

Step 1

Read the text and determine the instructional goals of the lesson.

Step 2

Based on the lesson goals, identify words/concepts that students should know (at some level) by the end of the lesson. These are the Level 1, 2, and 3 words. Words that aren't chosen are Level 4 words.

Step 3

"Chunk" instruction by teaching related concepts together (e.g., it makes sense to teach *omnivore*, *carnivore*, and *herbivore* together). Chunking concepts helps the students make connections across concepts while saving teachers valuable instructional time.

Step 4

Which words/concepts does the student absolutely need to know *before* reading? These are the Level 1 (in-depth knowledge) and Level 2 ("foot-in-the-door" knowledge) words.

Step 5

Which words does the student need to know, but not necessarily before reading the text? These are the Level 3 words and can be addressed *after* reading.

Step 6

What, specifically, do you want the student to know about each word? What is the learning task for the student? In addition, think of how related terms are conceptually connected. These factors will help determine *how* you teach the word (i.e., which teaching strategy you choose).

by teaching these related concepts together (e.g., it makes sense to teach *omnivore*, *carnivore*, and *herbivore* together). Chunking concepts helps the students make connections across concepts while saving teachers valuable instructional time. Think of teaching the underlying "system" that ties the concepts together, rather than teaching the words as a series of discrete ideas.

- From the pool of words chosen, decide which words the students absolutely need to know *before* reading the passage.

Of these, which ones do the students need a deep knowledge of before reading? These are the Level 1 words. Which ones does a student require only a "foot-in-the-door" knowledge of before reading? These are the Level 2 words (remember, Level 2 words can always be explored more deeply later).

- Decide which words the students should know on some level, but don't need to have directly taught before instruction. These are the Level 3 words.

• What do you want the students to know about each word? Do you want them to be able to compare and contrast it with similar concepts? Or, do they need only a surface-level understanding of the word? In addition, think of how related terms are conceptually connected. Answering these questions will help determine *how* you teach the word (i.e., which teaching strategy you choose).

How does this look in Bob's classroom?

Let's return to Bob, preparing to teach next week's chapter, but this time using the four-level framework described above. In the first section of the chapter, there are nine key terms highlighted at the chapter's beginning: *civics, citizen, government, public policy, budget, dictatorship, direct democracy, representative democracy*, and *majority rule*. Bob has allotted two 50-minute class periods to teach these concepts. At first, this appears a bit overwhelming to Bob. But then he steps back, takes a deep breath, and quickly skims the section of text. He identifies the main goal for the lesson—to have the students compare and contrast *dictatorship, direct democracy*, and *representative democracy*. Without his main instructional goal identified first, Bob would have no fixed point by which to guide any of the following instructional decisions he must make. With this main instructional goal in mind, and with the experience of 10 years teaching civics to seventh graders, Bob assigns each of the key terms in the textbook a level, according to the four-level framework.

Level 1: *dictatorship, direct democracy, representative democracy*

Level 2: *citizen*

Level 3: *government, majority rule*

Level 4: *civics, public policy, budget*

Experience tells Bob that *dictatorship, direct democracy*, and *representative democracy* are relatively abstract concepts to most seventh graders and will thus require a substantial chunk of instructional time before reading. Therefore, these three concepts should be Level 1 words, or critical ideas of which he feels the students need a solid understanding before reading the text. However, Bob also knows he can save time by teaching these three related concepts together as a system (i.e., all three concepts are types of government that the students can compare and contrast across a common set of features). Bob doesn't think the word *citizen* is defined clearly in the textbook, so he wants to address it up front, but he realizes his students only need a "foot-in-the-door" knowledge of this word to get the gist of the passage. *Citizen* is a Level 2 word which Bob can quickly define and provide an example of the word used in rich context before reading (Graves, Juel, & Graves, 2004). Bob decides on *government* and *majority rule* as his Level 3 words. Although he wants to directly address each of these concepts, Bob doesn't think they need to be taught before reading. The concept of *majority rule* is clearly explained in the text and will naturally follow from his preteaching of *direct democracy* and *representative democracy*. Bob's Level 4 words are *civics, public policy*, and *budget*. These may come up naturally in the discussion after reading, but Bob feels that they do not fit with his main instructional goal. *Civics* was discussed during the first week of class, and Bob knows the other two concepts will be taught later in the year in more depth so he decides they are not a priority at this time.

Instead of facing the initially daunting task of preteaching nine separate concepts, now Bob only needs to preteach four concepts in two "chunks": one (*citizen*) that can be dealt with very quickly, and the other three (*dictatorship, direct democracy*, and *representative democracy*) that are conceptually connected and can be addressed together as a system. The vocabulary teaching tasks for Bob and the vocabulary learning tasks for his students seem more manageable at this point.

After the words—choosing the strategy

After Bob decides which words to teach and assigns each word a level, he must decide *how* best to teach each word. The accompanying three tables (see Tables 1, 2, and 3) are meant to guide teachers in choosing appropriate instructional strategies based on their purpose in teaching the word and the level of the word. We want to make three general comments about these strategy tables.

Table 1
Sample strategies for Level 1 words

Purpose/learning task—What, specifically, do I want my students to know about the word/concept?	Strategy	Planning time	Teaching time	Before	During	After
I want my students to be able to compare/contrast content area concepts across multiple common features (e.g., comparing whales, dolphins, and sea turtles on their diet, habitat, and predators)	Semantic Feature Analysis (SFA) (Pittelman, Heimlich, Berglund, & French, 1991)	Medium to high	High	X	X	X
I want my students to know the defining features of a concept in depth and compare/contrast it with similar concepts (Science: reptiles—what is and is not a reptile, compare to amphibians)	Frayer Model (Frayer, Frederick, & Klausmeier, 1969)	Medium to high	High	X	X	X
I want my students to develop a deep knowledge of one word/concept	Semantic/Concept Mapping (Heimlich & Pittelman, 1986)	Low to medium	High	X	X	X

Table 2
Sample strategies for Level 2 words

Purpose/learning task—What, specifically, do I want my students to know about the word/concept?	Strategy	Planning time	Teaching time	Before	During	After
I want my students to have a basic, "foot-in-the-door" knowledge of the word/concept	Definition plus rich context (Graves, Juel, & Graves, 2004, p. 231)	Medium	Low	X		
I want my students to briefly extend their knowledge of a word/concept with which they are already acquainted.	Concept circles (Vacca & Vacca, 2001, p. 180)	Low	High	X		

1. Begin with the end in mind. Before deciding on a strategy, the teacher should ask what, exactly, does he or she want the student to know about this particular word/concept by the end of instruction? What is the purpose or instructional goal of teaching each word? The instructional goal for each word should match the time spent teaching the word, when it's taught in the lesson, and how it is taught. For example, consider the word *amphibian* in two very different teaching contexts. For a narrative story about a frog in which the word *amphibian* is used briefly, the students may only need to know two facts about amphibians—that amphibians can live in and out of water, and that a frog is a type of amphibian. In this case the word may simply be discussed with the students before reading. However, if the instructional goal in an eighth-grade science course is to compare and contrast the defining features of *amphibians*, *reptiles*, and *mammals*, then the students obviously need a much deeper and broader knowledge about this concept. In sum, establishing the learning goals for each word beforehand influences time and strategy decisions.

2. Only Level 1 words require substantial preteaching; for all other levels, rich instruction will come during or after reading (if at all).

3. The tables are not meant to be an exhaustive list of vocabulary strategies or a detailed description of each strategy; rather, they are meant to show one way teachers can systematically organize strategies to make instructional decisions.

Table 3
Sample strategies for Level 3 words

Purpose/learning task—What, specifically, do I want my students to know about the word/concept?	Strategy	Planning time	Teaching time	Before	During	After
I want my students to be able to use adjectives that describe people (*obstreperous*, *truculent*, *brutish*)	"Applause, applause!" (Beck, McKeown, & Kucan, 2002, p. 45) "Have you ever?" (Beck, McKeown, & Kucan, 2002, p. 45)	Low	Low to Medium			X

Putting it all together

The next Monday, Bob startles the class by stating, "OK, I've decided to make some changes in class for the remainder of the year. And, because I'm the teacher and in charge, and this classroom is not a democracy, you won't have any say in my decisions. First, I have decided that we will start wearing mandatory uniforms for all students starting next week. I will pass out the uniform policy at the end of the period. Next...." As the students' jaws drop, Bob continues with his list of radical changes to classroom and school policy and procedure. After a few minutes, much to the students' relief, Bob admits that he is only playing the role of a *dictator*, the first vocabulary word they will study today. Bob engages his students in a Semantic Feature Analysis (SFA) activity, in which they must compare and contrast his three Level 1 words (*dictatorship*, *direct democracy*, and *representative democracy*) across four features (see Figure 4). Bob chose the SFA over other possible methods of instruction because it best supports

the students' learning task—to compare and contrast three forms of government across a common set of features.

Using his *dictator* role play as background, Bob leads the class in a discussion about the features of a *dictatorship*. He raises issues such as whether dictators are elected and whether citizens have any say in dictators' decisions. Bob never directly tells the students the answers, but has them commit to a "prediction" before the reading by penciling in a Y (yes) or N (no) in each cell in the SFA. The students are told that they may change their prediction during or after the reading as they learn more. Next, Bob leads the class in a discussion centering on the difference between a *direct democracy* and a *representative democracy*. The school's student government serves as a concrete example for students of a representative democracy. Bob asks the students to again "predict" features on their chart. Finally, he briefly defines the word *citizen*—his "foot-in-the-door" word—and

Figure 4
Semantic feature analysis: Comparing and contrasting three types of government

	Citizens have voting rights (Yes/No)	Citizens elect leaders (Yes/No)	Limit to leaders' term of office (Yes/No)	Representatives are elected by citizens (Yes/No)	All decisions voted on by people (Yes/No)	Decisions can be made quickly (Yes/No)
Dictatorship						
Direct democracy						
Representative democracy						

presents it in a sentence with rich contextual support. Bob is 25 minutes into his lesson.

Next, Bob asks the students to begin reading the chapter in pairs and to complete their SFAs as they read, either confirming their predictions or modifying them. Bob realizes that they won't be able to read the entire section in 15 minutes, so he assigns only the three pages that directly address *dictatorship*, *direct democracy*, and *representative democracy*. With a clear and specific purpose in mind, the students are engaged in the reading. After they are finished, Bob will have 10 minutes at the end of the period to revisit the SFA, allowing the students to discuss and revise their understandings of these three core Level 1 concepts. During this postreading discussion, Bob can assess his students' knowledge of the key concepts, clari-

fy any misconceptions that may arise, and extend and elaborate on their understandings. Bob will assign the remainder of the chapter section for homework. He decides to address his Level 3 words (*government* and *majority rule*) tomorrow. Because Bob wants the class to deeply explore *majority rule* and to elaborate on their understanding of this concept, he decides to use a concept map as the initiating activity for tomorrow's lesson.

Staying "on course"

We would like to end with a paraphrase of a brief parable. Bill, a jungle guide, is working his way through the thick brush with a machete as a line of travelers follow him. The brush is so thick and tall that he can't see where he is going. One of the

travelers at the back of the line yells forward, "Bill, how's it going?" Bill, wiping the sweat from his brow, yells back, "Great, we're moving forward at a fast clip and we're on schedule!" The traveler responds, "Do you want to stop for a minute so I can get up on someone's back and look ahead to make sure we're still on course?" To which Bill responds, "We don't have the time for that, we've got to arrive on schedule!" (Covey, 1990, p.101).

In working alongside content area teachers, we have found that they often feel like that jungle guide, Bill. They are so involved in cutting through the brush—so focused on covering every highlighted or mandated word and concept—that they rarely, if ever, take time to check if they are still "on course." Are they really spending their valuable instructional time wisely? Often, because they have no framework for guiding their instructional decisions, anything goes. And anything often devolves into one-size-fits-all instruction— one size for the time involved, one size for the words, one size for the method of instruction, and one size for the students. We realize that there is no one best way to teach vocabulary. However, we believe instructional decisions regarding what method we should use to teach vocabulary (i.e., the strategy we choose) must always depend on our knowledge of our students, the nature of the words we choose to teach, and the goal or purpose we have for teaching each word. Different students, different words, and different instructional goals call for different strategies used at different points of instruction for differing amounts of instructional time. The content teacher must take all of these factors into account when planning instruction. This is no simple task, and it is not an exact science. It is perhaps better described as an art informed by science. However, even art is not without some semblance of guidelines or structure. In this article, we have tried to provide a useful framework for content area teachers as they practice the art of teaching vocabulary effectively.

REFERENCES

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

Blachowicz, C.L.Z., & Fisher, P. (2000). Vocabulary instruction. In M.L. Kamil, P.B. Mosenthal, P.D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 503–523). Mahwah, NJ: Erlbaum.

Cassidy, J., & Cassidy, D. (2005/2006, December/January). What's hot, what's not for 2006. *Reading Today, 23,* 1, 8–9.

Covey, S.R. (1989). *The seven habits of highly effective people: Restoring the character ethic.* New York: Simon & Schuster.

Frayer, D.A., Frederick, W.C., & Klausmeier, H.J. (1969). *A schema for testing the level of concept mastery* (Working paper No. 16). Madison, WI: Wisconsin Research and Development Center for Cognitive Learning.

Graves, M.F. (1984). Selecting vocabulary to teach in the intermediate and secondary grades. In J. Flood (Ed.), *Promoting reading comprehension* (pp. 245–260). Newark, DE: International Reading Association.

Graves, M.F. (2000). A vocabulary program to complement and bolster a middle-grade comprehension program. In B.M. Taylor, M.F. Graves, & P. van den Broek (Eds.), *Reading for meaning: Fostering comprehension in the middle grades* (pp. 116–135). Newark, DE: International Reading Association.

Graves, M.F., Juel, C., & Graves, B.B. (2004). *Teaching reading in the 21st century* (3rd ed.). Boston: Allyn & Bacon.

Graves, M.F., & Prenn, M.C. (1986). Costs and benefits of various methods of teaching vocabulary. *Journal of Reading, 29,* 596–602.

Heimlich, J.E., & Pittelman, S.D. (1986). *Semantic mapping: Classroom applications.* Newark, DE: International Reading Association.

McKeown, M.G., & Beck, I.L. (1988). Learning vocabulary: Different ways for different goals. *Remedial and Special Education, 9*(1), 42–52.

Pittelman, S.D., Heimlich, J.E., Berglund, R.L., & French, M.P. (1991). *Semantic feature analysis: Classroom applications.* Newark, DE: International Reading Association.

Stahl, S.A., & Nagy, W.E. (2006). *Teaching word meanings.* Mahwah, NJ: Erlbaum.

Vacca, R.T., & Vacca, J.L. (2001). *Content area reading: Literacy and learning across the curriculum* (7th ed.). Boston: Allyn & Bacon.