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The organization and teaching of things and the words that signify them

Here is a model of the hierarchy or gradations of a student's knowledge of things and the words that signify them. This model orders these variations in terms of difficulty. Suggestions are also provided to help match methods of vocabulary instruction to individual students' needs.

■ The essence of all instruction is helping students learn new things or concepts and the words that signify those things (sometimes called teaching meaning vocabulary, word meaning instruction, concept development, or vocabulary instruction). In spite of its centrality, there exists no model of this relation between things and their words that aids the teacher in teaching meaning vocabulary. And it appears that teachers do need better sources to help them teach concepts; after examining teachers' manuals for guidelines for teaching meaning vocabulary, Graves and his colleagues (Graves, 1987; Ryder & Graves, 1994) conclude that the methodology of meaning vocabulary instruction "could be improved."

It is my position that one reason for the limitations of such instructional methods is the lack of a model of the relation or hierarchy of the association between things and the words that signify them. Without such a model, every new thing to be taught is considered unique; thus the methods of teaching one concept and its word do not systematically vary from the methods of teaching a different concept and its word. Yet, we have long sensed that a student's ease in learning a new thing and its word varies considerably with

his or her prior knowledge.

For example, if a student has previously perceived the metal or plastic tip on the end of a shoelace, that student will have an easier time learning its name, *aglet*, than would be the case if the student had never perceived these shoelace tips and had to learn both the thing and the name. Another example, perhaps more challenging, is the word *kurtosis*. Kurtosis signifies the concept of the relative flatness or "peakedness" of a sample frequency distribution compared to the normal distribution. Teaching the word *aglet* requires only associating the known thing with its oral and written representation—and then being sure the student

reads and uses the word several times. But to learn the thing and word *kurtosis*, the student must first learn what a normal distribution is, then what a sample frequency distribution is, and then how to compare the normal and sample frequency distribution in order to determine the relative flatness or peakedness of the sample frequency distribution. I would presume that the concepts flatness and peakedness might be known by anyone learning *kurtosis*, but the remaining concepts would probably have to be taught.

This example of the possible differences in a learner's prior knowledge of *aglet* and of *kurtosis* and the demonstrated impact of these differences on the teaching of each thing illustrate a fairly common circumstance in the teaching of words and things. What is needed is a model that hierarchically arranges a broad spectrum of the varying relations between prior knowledge of a thing and prior knowledge of its word—from things and words such as *kurtosis* to *aglet* to *dog*. This model could then be used as a guide in matching instructional methods to the difficulty of the word and thing to be learned.

Overview

In the following sections, I give definitions and concrete examples of terminology frequently used in discussions of concept learning and explain rationales for the importance of teaching students things and the words that signify them. Then I provide a graphic model of the gradations in knowledge of things and words in any given person's lexicon and a table that presents combinations of such gradations. Finally, I offer specific activities designed to promote natural growth in meaning vocabulary. The principle underlying each suggested activity is that learning things is a natural endowment of children, and that schools and teachers must be careful to perpetuate that interest.

Definitions

The following terms require explanation before moving into a discussion of the model: *things*, *words*, *cognition*, *schema*, and *prior knowledge*.

Things. The word *things* as used here should not be interpreted as careless or slovenly language; it

was chosen with thought and deliberation. The term is adopted from Brown's book *Words and Things: An Introduction to Language* (1958), and refers to any object, feeling, action, or idea in the real world or in a person's imagination. It is assumed that there is nothing in the entirety of the physical, intellectual, and social universes that cannot be classified into one of these four categories: objects (e.g., ball), feelings (e.g., anger), actions (e.g., touch) and ideas (e.g., justice). For the sake of brevity, all these are identified as things. Brown is not the only, or even the first, person to use things as a shorthand referent to any or every object, feeling, action, or idea. Moralists such as Saint Augustine, philosophers such as Ludwig Wittgenstein, and psycholinguists such as John Carroll have all used things in a similar manner. Its use here is not original.

The word *referents*, a common term in linguistic and philosophical circles, could be used in lieu of the word *things*. *Concept* is also another word that might be used.

Things do not move from one category to another. True, the word *depression* may signify an object (an indentation or dip), a feeling (sadness, loneliness, etc.), or an action ("stock market prices are depressed"); but these are all different things. It just happens that they are signified by the same word.

Words. Words are a series of phonemes or written letters that signify one or more things. Knowledge of the pairing of a spoken/written word to the thing it signifies is knowledge of an arbitrary paired association between the thing and a word. And according to Lennenberg (1967), these arbitrary associations must be learned, in a sociolinguistic environment. The arbitrariness of the association of things and words is wonderfully depicted in one of Jim Unger's *Herman* cartoon strips. The strip opens with two cavemen sitting in a cave, one saying to the other, "I can live with 'knee.'" The next box shows the first caveman pointing to his toe as he says to the second caveman, "Now, what are we going to call these things?" The conversation goes back and forth:

Caveman 2, "What about 'Joe.'"

Caveman 1, "No, not 'Joe.' What about 'moe'?... 'roe'...."

Caveman 2, "'Soe'.... 'toe'...."

Caveman 1, "Toe."
Caveman 2, "I like 'toe.' "
Caveman 1, "Write it down."

Cognition. *The Dictionary of Reading and Related Terms* (Harris & Hodges, 1981) defines *cognition* as "knowing; specifically, the process, or result, of recognizing, conceiving, judging, and reasoning." All persons are born with the facility to perceive and conceive things and the facility to organize the things perceived/conceived into organizing structures, called here framework or schema. One role of teachers and schooling in cognition is to facilitate the acquisition of perceptions and conceptions—things—and the words we arbitrarily assign to these things, and to help students arrange these things into organized frameworks.

Schema. Although Bartlette (1932) used the word *schema* decades ago, and the schema concept was discussed by Aristotle, the term has received special attention in the last few years. The first definition of schema in *The Dictionary of Reading and Related Terms* (Harris & Hodges, 1981) is "a generalized description, plan, or structure." In essence, a schema or framework is the glue that holds the bits and pieces of information about a thing or things together. Schema is the way a person has associated, discriminated, and organized things. Other terms used to describe this process include script, framework, and conceptual framework.

A perfectly legitimate word that could describe this concept, and one that would be readily understood by most, is the word *thesaurus*. A thesaurus collects, under a heading, a set of things or meanings (designated by their words) that are associated to some degree and can be discriminated from all other things in the language. Likening the organization of the mind to the organization of a thesaurus may, perhaps, serve as a useful analogy; but the term *thesaurus* will not be adopted here. Yet one more word to describe schema is not necessary.

Prior knowledge. *The Dictionary of Reading and Related Terms* (Harris & Hodges, 1981) defines knowledge as "a state of general familiarity with facts, principles, ideas, etc." In reading comprehension, the term is used to indicate readers' familiarity with the content read or to be read. Readers residing in inner

cities and with little or no knowledge of farm life and farm animals would be presumed to have little prior knowledge for a story describing one day in the life of a farmer. A child living on a farm in a rural area, however, would likely have a great deal of prior knowledge about this story.

Here, prior knowledge is equated with knowledge of things and the framework of things: i.e., knowledge of objects, ideas, feelings, and actions and their organizations, associations, and discriminations. Prior knowledge is the depth and organization of a reader's knowledge of objects, ideas, feelings, and actions before reading a specified text. And, because reading comprehension demands the processing of words, the omnipresent interplay of words and things remains.

Why learning things and their words is important

Why should things and words be taught at all? Briefly, learning things and words serves four major educational goals. First, it increases the child's perception and conception of the world. Growth in meaningful vocabulary helps students to expand their ability to perceive similarities, differences, and order within the world. The continued development of meaning vocabulary is not simply adding to the student's knowledge this week's list of things and their words as one adds layer upon layer of bricks when building a wall. Rather, it requires youngsters to make finer and finer discriminations of ideas, objects, feelings, and actions. Thus, when teachers increase learners' acquisition of things and their words, they bring about a change in the learner and the learner's conceptualization of the world around him or her.

George Bernard Shaw demonstrates how the learning of a new thing causes reorganization of prior knowledge of things. In his play *Major Barbara*, the title character, Barbara Undershaft, is a Major in the Salvation Army. She has spent most of her life combating crime and social disorder, which she believes is caused by sin. Her father, a wealthy munitions manufacturer, and one of his friends, a whiskey distiller, donate a large sum to the Salvation Army. Barbara resigns her post because

she sees this donation from an arms maker and a distiller as hypocrisy, but her father tells her that the source of crime is not sin, but poverty. When she comes to accept this idea, she says (in Act III), "My spirit is troubled." Undershaft replies, "You have learnt something. That always feels as if you had lost something."

Learning things and words also facilitates students' abilities to organize new things into a framework or schema—which may require substantial reorganization of the framework or schema. Emphasizing meaningful vocabulary in reading and content area instruction is almost always teaching students how the new thing and its word are associated, integrated, and differentiated from the things and words they already know—i.e., from their prior knowledge. In effect, focusing on new things and words in reading comprehension assignments mandates that students activate prior knowledge and expand or reorganize that prior knowledge by creating refined or new discriminations or new associations. Linus Pauling (1991/1994), twice awarded the Nobel Prize for Chemistry, capsulized this necessity to organize knowledge when he said: "If I couldn't find a place for some thing [an idea, object, feeling or action], then I would change my picture of the world until I understood where it fit. Or, I would throw it out and come back to it later."

Third, learning new things and words facilitates students' abilities to recognize both in print and in oral communication the words that signify things. The things we wish to teach students almost always have names, and indeed, those names make up written and oral communication. When students do not know the meanings of words used in written text, comprehension is diminished (Graves, 1984; Jenkins, Stein, & Wysocki, 1984; Nagy, Herman, & Anderson, 1985; Stahl & Fairbanks, 1986; Wittrock, Marks, & Doctorow, 1975).

And fourth, learning things and words facilitates students' abilities to use appropriate words. Our society places great social value on the judicious use of words; indeed, we have special words and heap considerable distinction on those who have a profound mastery of words—e.g., Abraham Lincoln and

William Jennings Bryan were known as great orators or rhetoricians. On the other hand, those who use words inaccurately are often open to ridicule—and again, we have special words for certain errors in the use of words: e.g., a *malapropism* (after Mrs. Malaprop, a character in Sheridan's play *The Rivals*) means calling a thing (e.g., *cadenza*, the musical term) by a wrong-but-similar-sounding-word (e.g., *credenza*, a side desk or cabinet). In the United States, TV character Archie Bunker was famous for malapropisms; indeed, some Americans today use the word *bunkerisms*, instead of malapropisms.

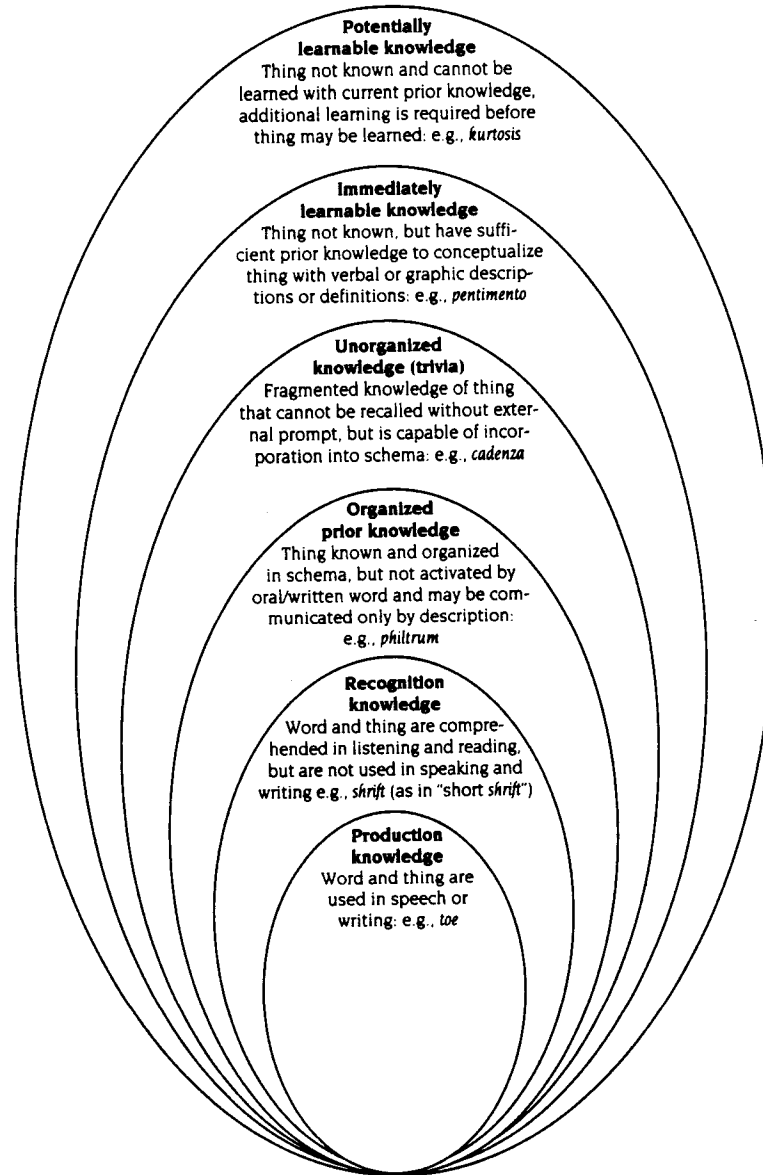
The classification of things and the words by which we signify them

A model of the relation of words and things within an individual learner is presented in the Figure on the following page. This model visually presents the categories, hierarchies, and interactions of a person's knowledge of things as a basis for teaching things and words. The underlying premise of this model and the preceding discussion is that the learning of things is the perception, association/disassociation, integration/assimilation, extension, or reorganization of prior knowledge. New knowledge means conceiving prior knowledge in a different manner—via perception, association, or integration/assimilation—or incorporating new knowledge within the existing framework of prior knowledge—via reorganization or extension.

The application of this rationale can be seen in the Figure, called an individual's "lexicon." *The Random House Dictionary of the English Language, Second Edition Unabridged*, 1987, defines lexicon as "the vocabulary of a particular language, field, social class, person, etc."

Here, lexicon means an individual's storehouse of things and words. This lexicon is hierarchically organized—ranging from "potentially learnable knowledge" to "production knowledge." Further, the hierarchical location of a thing in this lexicon is not necessarily the same as the hierarchical location of a word in that lexicon. The overlapping areas in the Figure on the following page reflect six levels of knowledge of a thing and the word that signifies it.

A model of the relation of things and words in an individual's lexicon



Note: A "thing" is any real or imaginable object, feeling, action, or idea.

Potentially learnable knowledge. Every person possesses a certain capacity to learn a thing, but not without first learning other things. This, the largest and outermost oval, indicates that almost all things can be potentially learned, but true learning requires that the thing to be learned be associ-

ated with, integrated with, or discriminated from other things—i.e., nothing can be learned if not associated with or discriminated from some other knowledge. (This argument begs the question, of course, of an infant's initial forays into learning things.) The thing *kurtosis* is used to demonstrate

this level. As indicated in the introduction, the word *kurtosis* means the relative flatness (platokurticness) or peakedness (leptokurticness) of a scatterplot as contrasted to the normal distribution.

For most persons, this definition fails to help them learn the thing kurtosis, because most will not know what a scatterplot or normal distribution is. This concept of kurtosis is certainly learnable, but in all likelihood, the learner would first need to learn what scatterplots and the normal distribution are. Of course, statisticians already know what kurtosis is, and in their lexicon, this thing and its word would be part of production knowledge.

Immediately learnable knowledge. This level of the hierarchy identifies those things that we do not know or have never knowingly perceived; however, we do know (or have perceived) all things that are necessary in order to know this thing, but we need instruction or demonstration of the unknown thing. Using the thing kurtosis, if a person did not know what kurtosis was, but did know what a scatterplot was and what the normal distribution looked like, then s/he could readily learn what kurtosis is by a simple demonstration of the differences between a normal distribution and flatter and more peaked scatterplots.

The word *pentimento* is an excellent example for most adults. When an original oil painting is painted over with a second oil painting, and the second oil painting begins to wear or chip away after many years, that part of the original oil painting that shows through the newer oil painting is called *pentimento*. Note in this case that the necessary concepts or things are (a) an oil painting being (b) painted over by a second oil painting, and (c) that second oil painting chipping away. All adults have prior knowledge of (a), and certainly can understand (b) and (c); thus they have knowledge of all the things (ingredients) necessary to learn *pentimento*.

Unorganized knowledge (trivia). All humans possess a large pool of fragmented bits and pieces of knowledge of isolated things, which, because they are not clearly defined or because they are not associated (or slotted) into organized knowledge structures, as Pauling described, are simply discarded from meaning, or they remain in meaning as

isolated bits of trivia retrievable only when their recall is prompted by some motivating and distinctive cue. I know very little about the structure of music, but I do know that the word *cadenza* has something to do with music. I have looked the definition up in the dictionary, but its definition contains too many other musical terms that I do not know; therefore I cannot learn *cadenza* without first learning those other terms. It just remains a word I have heard and one that I know has something to do with music, but I do not know where it really fits.

Organized prior knowledge. At this level, the learner knows the thing, but does not know any word to communicate that thing; thus the thing may be communicated only in descriptive terms. Every child is aware of the two little lines running from the bottom of the nose to the top lip, that is, everybody knows the thing philtrum, but very few know the word *philtrum*.

Recognition knowledge. In reading or in listening, we hear many words we know that signify things we also know, but these words are not words we would necessarily ever use in our own writing or speech. Some of these things and words we simply choose not to use or never have the occasion to use; others we are not certain enough about to use in our writing or speech without checking them in reference books or dictionaries. But there is a small—but significant—corpus of these things and words we understand only when others use them within a given idiom or context.

Most adults understand the phrase “short shrift” to mean giving little time or attention to a matter, but most adults would never use the word *shrift*, because most do not know what it means when it stands alone (penance imposed by a priest after confession). Our language is replete with such terms: “the prodigal son,” “a fine fettle,” “draw a bead on.”

Production knowledge. This is the most overt level of knowledge of things and their words. Here, we are able to recall a thing from memory and use the word that signifies it in speaking or writing. It is possible that the word we use to signify a thing we know may also signify some other thing that is not known, but that is a different thing. For example, *toe* is not only a noun that can signify the ap-

Table 1
Conceptualizing a student's knowledge of things and words
 (With suggestions for matching vocabulary instruction to a student's knowledge of words and things)

Status of child's knowledge of word and thing		Examples of things and words	Teaching suggestions
Thing	Word		
Known	Known	Object: <i>toe</i> (on a foot) Idea: <i>fair</i> (equitable) Action: <i>sit</i> (on a chair) Feeling: <i>happy</i> (not sad)	No direct instruction necessary; may wish to review.
Known	Not known, but does know another word for that thing (i.e., a synonym) or knows the generic term of which this thing is a class.	Object: <i>tresses</i> (hair) Idea: <i>interior</i> (inside) Action: <i>lope</i> (to jog) Feeling: <i>depressed</i> (sad)	Display object or picture; associate with synonym, but clarify shades of difference between synonym and word/thing.
Known	Not known and knows no other word for the thing; therefore, cannot access lexicon (even if can pronounce word by process of word analysis). May be able to display knowledge of the thing by description or simile.	Object: <i>philtrum</i> (lines from nose to mouth) Idea: <i>objective</i> (impartial) Action: <i>checkout</i> (a book, groceries) Feeling: <i>confused</i> (mixed up)	Display object or picture; discuss description, antonyms, usage.
Not known or only vaguely known.	Not known, but might still comprehend this portion of the text by familiarity with the idiom or the word's usage in the specific context.	Object: <i>arch</i> (as in arch-rival) Idea: <i>portent</i> (omen) Action: <i>simmer</i> (as in simmer down) Feeling: <i>rue</i> (as in rue the day)	Possibly ignore if there is a high density of difficult words in the text; teach idiom as a whole if that is word/thing's major use (i.e., rue the day); discuss definition and description, usage, semantic webbing.
Not known—but has the prior knowledge needed to learn the thing.	Not known and (a) will not be able to use information conveyed by the word in comprehending text, or (b) will obtain only partial meaning via context.	Object: <i>palimpsest</i> (erased writing still visible) Idea: <i>integrity</i> (honesty) Action: <i>parsimony</i> (to be miserly) Feeling: <i>lament</i> (to feel sorrow)	Display object or picture; discuss definition and description, comparison/contrast, semantic webbing, usage.
Not known—and does not have the prerequisite knowledge to learn it.	Not known and will not be able to use information conveyed for comprehension of text and will not be able to learn word's meaning from the context.	Object: <i>Gestapo</i> (when does not know Hitler) Idea: <i>kurtosis</i> (shape of scattergram) Action: <i>osmosis</i> (movement of liquid) Feeling: <i>self-actualization</i> (Maslow's hierarchy)	Postpone instruction until prerequisite knowledge is learned, or ignore.

pendages on our feet, but it also can be used as a verb to signify driving a nail obliquely (at an angle) instead of straight up and down.

There are some things the learner is not able to learn given his/her current prior knowledge. If teachers and schools think a learner must learn these things, then the student will first need to learn other things. Some of these other things the learner may not know directly, but if the learner has

sufficient prior knowledge that can be discriminated, associated, reorganized, or extended, then he or she can perceive these other or preliminary things if shown or explained. There are other things the learner already knows, but s/he may not know particular words used to signify them. Certainly varying degrees of instruction are needed to meet these varying needs.

Teachers must recognize that individuals vary in

their prior knowledge of things, and account for this in their teaching of things and their associated words. The model clearly implies efficiency in that teaching a new thing (and its word) requires the teacher to teach at the point of the match between the learner's prior knowledge and the requirements for learning the new thing.

Strategies for matching vocabulary instruction to student prior knowledge

The Figure shows that things can vary considerably in degree of difficulty to learn. Words can also vary in the degree of difficulty required to learn or recall, though to a much lesser extent than things. When a learner is required to learn both a thing and its word, then the difficulty of that learning task depends on the combined learning of the thing and the word. Using the conceptualization and hierarchy portrayed in the Figure, Table 1 presents six possible combinations of degree of prior knowledge of a thing and degree of prior knowledge of the word that signifies the thing. For each of these six hierarchical levels, (a) examples of things and word associations are shown for objects, ideas, actions and feelings, and (b) suggestions for teaching each level are presented.

Identifying differentiations in a student's prior knowledge of a thing is valuable, because not every thing must be taught as if the student had no prior knowledge of it. Students who know a thing and one word that signifies the thing (e.g., the pile of snow left by a snowplow known as a snowbank) can be taught other words that also signify similar things (e.g., windrow, a row or line of hay or other grain raked together to dry), therefore avoiding the unnecessary time and effort of trying to teach a thing or concept already known. Row 2 of Table 1 presents other examples of associating known things/known words to new and unknown words.

Students also have visual images, perceptions, or prior knowledge of many things for which they have no specific word or terminology to signal them (e.g., the lines between the nose and upper lip are called the philtrum). Row 3 of Table 1 displays examples of associating known things for which the learner has no word to a new word. In this situation,

teachers need only to teach the association of a word with a known thing—surely a significantly easier task than learning the thing. Recognizing and taking advantage of such differentiations in students' prior knowledge of things may greatly reduce the amount of instruction required.

It is also possible to differentiate the potential difficulty for a learner to learn totally new things that the learner has never encountered. As seen in row 5, some new things are conceivable by the learner because s/he has sufficient prior knowledge of the important attributes (i.e., associations and discriminations) of the new thing, and those attributes need only minor extension or reorganization to reach an understanding of the thing, such as *pentimento*, which was discussed earlier. If all of the important attributes of *pentimento* are either known or easily conceivable, then all the ingredients needed to learn *pentimento* are in place and need only to be identified and reorganized.

On the other hand, as shown in row 6, a learner may be required to learn a thing whose important attributes are not part of his or her prior knowledge. The word *kurtosis* used earlier as an example demonstrates this situation.

Differentiating things that need to be learned in the manner conceptualized here should assist teachers in identifying strategies for teaching those things, and identifying those things their students are not yet ready to learn.

Promoting natural growth in meaning vocabulary

Using the conceptual model already discussed, teachers can employ three basic strategies to increase students' learning of things and the words by which they are signified. First, because the acquisition of knowledge of words and things is intrinsic to human nature and part of the lifelong learning process, the most important strategy a teacher can employ in developing students' meaning vocabulary is providing a conducive environment for facilitating its natural growth. Second, the teacher must also teach students those strategies, skills, and habits thought necessary or useful to students for their continued, lifelong growth in meaning vocab-

ulary. A third method of learning things and words is formal instruction in school, but in contrast to natural acquisition of vocabulary and developing a lifelong curiosity about words, this is considered the least productive (Nagy & Anderson, 1984; Nagy et al., 1985; Sternberg, 1987).

Being least productive, however, does not mean nonproductive or irrelevant. Additionally, the basic ingredients of much of what content area teachers must teach consists of facts, terminology, and their organization—i.e., things, words, and schema. Therefore, this third task for teachers is teaching and reinforcing selected meaning vocabulary.

Stimulate interest in words and things. Over 1,300 years ago, Saint Augustine described (1942) the natural—and best—way to learn about things in the world and the words we choose to signify them.

I did not learn [to speak] by elders teaching me words in any systematic way, as I was soon after taught to read and write.... I observed that my elders would make some particular sound, and as they made it would point at or move towards some particular thing; and from this I came to realize that the thing was called by the sound they made when they wished to draw my attention to it. That they intended this was clear from the motions of their body, by a kind of natural language common to all races which consists in facial expressions, glances of the eye, gestures, and the tones by which the voice expresses the mind's state—for example whether things are to be sought, kept, thrown away, or avoided. So, as I heard the same words again and again properly used in different phrases, I came gradually to grasp what thing they signified; and forcing my mouth to the same sounds, I began to use them to express my own wishes. (p. 9)

Saint Augustine points out the child's natural curiosity about things in the world and the words that label those things—an inborn part of the human condition according to Lennenberg (1967). Saint Augustine's comments also describe the ideal conditions for learning words and things—in the family and society (note also his frequent use of the word *thing*).

While not all family and social situations are equally conducive for stimulating growth in meaningful vocabulary, considerable research supports the notion that what appears to teachers and schools to be a "language deficit" may instead be a

mismatch between the language of the school and the teacher and the language of the child (e.g., Heath, 1982, 1986; Wells, 1986). This means that many students may know a thing, but not know the word used to signify that thing. Nevertheless, young students all have a curiosity about words and things, and the teacher's task is to perpetuate or rekindle interest.

Enjoyable aspects of words teachers can emphasize to enhance natural curiosity include:

► Puns.

► Word quizzes—unscored and not for grades (e.g., *Reader's Digest*).

► Malapropisms, "the *subsidization* of one word in *lute* of another" (Ciardi, 1980).

► Changes in words over time—for example, *condescending* was once used to describe a person of high social status who had a great deal of understanding and empathy for those persons of lower social status; today the term is usually used to apply to a person who deals with others in a haughty manner.

► Derivations of words—for example, *crisscross* derives from the first symbol a student would write in a schoolroom of the colonial era, that symbol being a cross known as the "Christ Cross" (Mathews, 1966).

► Games—such as the Dictionary Game, in which one person (the holder of the dictionary) finds a very hard word in the dictionary and pronounces it for the group. Every member in the group then makes up his or her own definition of the word. The person who looked up the word (a) writes the correct definition, (b) collects all the definitions, and (c) reads each definition aloud several times. Going around the circle, players choose the definition they think goes best with the hard word. The writer of a fictitious definition receives 2 points when his/her definition is chosen by another; a person choosing the correct definition receives 1 point.

► Sniglets—things that do not have names or words, but should have (Hall & Friends, 1984, 1985), such as *ufluation*, the habit of searching for a snack and constantly reopening the refrigerator in hopes that something new will have materialized.

► Oxymoron—juxtaposition of two dissonant words, such as *thunderous silence*.

► Portmanteaus or blends—words that combine two words, such as *brunch* [*breakfast* + *lunch*], *smog* [*smoke* + *fog*].

► Spoonerisms (an involuntary transposition of sounds when speaking)—such as It's *kisstomary* to *cuss* the bride.

► Cartoons and comic strips: Almost every day of the week, there are cartoons or comic strips published in the newspaper that involve a play on words and things; Goldstein (1986) had an article in the *Journal of Reading* on the use of cartoons in vocabulary development.

There are, of course, some teaching methods—all too common, it is feared—that are at cross purposes with the goal of promoting curiosity about words. These include:

► Telling a student to look up a word in the dictionary when s/he asks you what it means. What the student quickly learns is not to ask what a word means. Hope that you never hear yourself say, "Look it up!" When asked, teachers should tell the meaning. And, if they do not know the meaning, teachers should enthusiastically look it up. It will not be long before the student will say, when the teacher does not know the word, that s/he will look it up and tell the teacher the meaning.

► Preparing long lists of words and asking students to look up each word in the dictionary, write the word and its meaning on a card, and turn the card over and write a sentence using the word.

► Having students identify all the words that they do not know in an assigned reading (this in itself is very good) and then making them look up each word, write its definition, and write a sentence using the word (this is not good).

Most students associate these activities with drudgery and develop negative attitudes towards tasks that involve learning new words. Negativism about new things and words is actually contrary to the natural inclination of humans (Lennenberg, 1967), so this tedious listing of words, looking them up, and writing them in sentences is counterproductive both affectively and cognitively.

By the way, teachers should ask themselves if they are genuinely interested in words. Teachers who are fascinated by words, their usages, and their

derivations will be more likely to stimulate their students' awareness of words.

Develop word consciousness. In his book *Words and Things*, Brown (1958) says that whenever he is reading and comes across an unfamiliar word or phrase, he has a sensation of derailment, "some expected click" (p. 82) of the mechanism fails to occur. One of a teacher's major tasks in developing meaningful vocabulary is to help students develop or perpetuate that click, here called word consciousness (after Reed, 1953).

Teaching students to note those words they hear and read yet do not know is one of the most important—perhaps the most important—habits teachers can pass on to students. Activities that could promote this attention to words not recognized in texts might include:

► Asking students to list or mark the words in assigned readings that they do not know—but not making them look up the words.

► Asking students to keep a list of words they hear and do not know.

► Telling students the potentially difficult words in a text and having students mark those words (in the book)—before reading the assignment.

► Stumping the class—students compete to find the hardest word of the day.

► Informing the class what word you have read or heard that stumped you and that you had to ask about or look up in a dictionary or thesaurus.

If a student fails to attend to unknown words, not only will that student have passed up an opportunity to learn a new word and the thing associated with it, but s/he will also have reinforced the poor habit of failing to note unknown words.

Teach and reinforce words and things continually. Teaching and talking about words and things should not occur at just one designated time per day; this activity should come up dozens of times in a day. Stopping a lesson for a moment to discuss a word is not wasting time—it is teaching students about the world around them.

Let me demonstrate this. I was speaking with a middle schooler one time who was telling me she had just come from a meeting of the editorial staff of the school's literary magazine and its teacher/

advisor. She was excited and told me all the things the editors were going to do: collect stories, articles, and poems from students; pick the material they would print; read each story, article, or poem to fix grammar, spelling, and "that kind of stuff"; have someone type each of the items selected; plan on how they would arrange the materials on the page; have the magazines printed; and then sell them to classmates. I asked her, casually, if in their discussions of these activities, the advisor had used the terms *solicit materials*, *review*, *piece*, *edit*, *redact*, *blue pencil galleys*, *layout*, *mock-up*, or *marketing*. She said no, and I thought to myself, a wonderful opportunity to teach some important jargon from the publishing industry has been missed.

Stimulate wide reading. Though little experimental research supports the notion that substantial amounts of reading causes increases in vocabulary, there does exist a sizable body of correlational data to support this intuitively appealing notion. Therefore, teachers must take considerable effort to stimulate interest in reading for pleasure. An activity that might be useful for teachers and their students is to ask students to write in a certain section of the book (perhaps the title page) all the words the student encounters but does not know. This promotes word consciousness. However, teachers must not force students to look these words up in a dictionary, for in the long run that requirement only teaches students to overlook hard words.

Not all students who engage in wide reading have a strong sense of word consciousness; thus wide reading does not help them learn new words (though it serves many other positive purposes). In this case, the teacher needs to review the book the student is reading to identify hard words, and then check the list of hard words the student has found. Another technique is for the teacher to underline hard words in the beginning chapters of a book to help the student begin to be aware of hard words. Teachers probably should underline almost all hard words they see, as Ryder and Graves (1994) found that fourth- and sixth-grade students found a greater number of hard words in their texts than were identified by either the teachers' manual or their teacher.

Lifelong vocabulary learning (indirect vocabulary instruction)

In the research literature, the term *indirect vocabulary instruction* is used to denote teaching students the strategies of independently determining word meanings (Petty, Herold, & Stoll, 1968). Graves (1987, p. 166) describes this as "learning to learn words." Use of context clues, the dictionary, and roots and affixes are the three indirect instructional methods I will briefly discuss. Wide reading is sometimes included in lists of indirect vocabulary-teaching methods, but I included wide reading in the section on promoting natural growth in meaning vocabulary.

Context clues. In the last few years there has been considerable debate about the utility of context clues as a means of learning meaningful vocabulary. In general, the research appears to support the conclusion that students do learn the meanings of words from context (Freebody & Anderson, 1983; Gipe, 1979; Nagy & Anderson, 1984; Sternberg, 1987), although there is conflicting evidence (Schatz & Baldwin, 1986). In addition to a lack of conclusive results regarding the effectiveness of context clues, it is also not readily understood how context operates to reveal a word's meaning. Since Werner and Kaplan's 1952 developmental study, only one or two studies have examined the process of deriving word meanings from context (McKeown, 1985; van Daalen-Kapteijns & Elshout-Mohr, 1981).

The experimental and process evidence simply are not conclusive; therefore one must develop programs on the basis of common sense and expert opinion. In his useful and practical guidebook on teaching vocabulary, Deighton (1974) provides information on specific context clues, insights as to how context might operate, and cautions about the limitations of context clues. Deighton claims that context clues:

- Reveal word meaning only infrequently. Many authors use a word to convey a specific meaning assuming the reader knows the meaning; therefore, they do not provide an explanation of the word's meaning.
- Reveal only one meaning of a word. Many words signify several meanings or things, but in a

given text, a word generally only signifies one of those meanings or things.

- Reveal only part of the meaning of that word.
- Allow for acquisition of new words, but gradually. Usually one cannot leave a reading situation in which context has provided some insight into the meaning of a word and feel confident about using that word in writing or speaking. It takes time to accumulate the information and confidence necessary to use a new word.

Limitations of context clues include dependence on prior knowledge, a clear-cut definition, and proximity to the unknown word.

Table 2 contains context clues that are helpful in determining a word's meaning from the context of a sentence, clause, or phrase. It is not recommended that specific instructional methods and practice exercises be developed for students to master each of these separate skills. Teachers should have knowledge of these potential clues, and point them out to students in specific contexts for specific words as the situation arises.

Teachers should also study carefully the readings they will be assigning to determine those hard words that are in a context that appears to provide sufficient clues for determining the words' meaning. These instances should be pointed out as the reading is assigned, and the students' ability to derive the meaning should be assessed after reading. Specific help that demonstrates how the meaning could have been derived should be modeled to those students who were not successful.

Dictionaries. Teachers should help students develop a level of curiosity about words that leads them to the dictionary voluntarily. This means that dictionaries should not be used to complete endless exercises requiring the student to look up one word after another. Three basic teaching strategies help students use dictionaries.

1. Students should develop at least four distinct skills needed to use dictionaries. Such instruction will necessitate the use of the dictionary, but learning how to use a dictionary can be done with only a little practice—in 1 to 3 weeks. Learning to appreciate a dictionary, however, may take a great deal of time, possibly several or many years. Additional-

Table 2
Certain useful context clues

-
- a. Definition: an outright definition of the word, term or phrase; usually the unknown word is followed by a form of the word *be*—
clones *are*; a computer *is*
 - b. Examples: usually include signal words that indicate an example is about to follow—
such, such as, like, especially, for example, other, this or these (followed by a synonym), *the way, in the way that*
 - c. Modifiers: phrases, clauses, or words usually appearing after a linking verb—
The women's movement, *which seeks equality with men*, is....
 - d. Restatement, which is used most frequently: the writer's conscious restatement when recognizing that more needs to be said, usually includes signal word—
in other words, i.e.; that is; that is to say; — — (dashes); () (parentheses); bold face type; italics; the word *or* plus a synonym (e.g., *things or concepts*); appositives (e.g., Abe Lincoln, *our 16th president*, was very....)
 - e. Inference: requires the reader to distinguish sentences that develop a thought and sentences that rephrase a thought. They are not explicit, and not directly teachable.
 - f. Inferences with established connections—
parallel sentence structure; repetition of key words; restatement in opposites or same; connecting words such as *yet, hence, thus, therefore, thereupon, ergo*.
-

Note: Table adapted from Deighton, 1974.

ly, there should always be dictionaries close at hand. The four skills students need include (a) alphabetizing, (b) selecting the appropriate meaning, (c) using the pronunciation key, and (d) understanding synonyms and antonyms.

2. A variety of dictionaries and other word resources might make looking up words fun, or at least less of a chore.

- Occupational dictionaries—e.g., psychology, education, engineering.

- *Oxford English Dictionary* (OED)—the compact edition is particularly appealing to students, because one must use a magnifying glass to read the text.

- Rhyming dictionaries.
- Thesauri.

► Dictionaries of peculiar words—e.g., *The Game of Words* (Espy, 1982), *A Treasury for Word Lovers* (Freeman, 1983), *Dictionary of Problem Words and Expressions* (Shaw, 1975), *A Browser's Dictionary* and *A Second Browser's Dictionary* (Ciardi, 1980, 1983), and *They Have a Word for It* (Rheingold, 1988).

► Visual dictionaries—e.g., *Facts on File Visual Dictionary* (Corbeil, 1986) and *What's What: A Visual Glossary of the Physical World* (Bragonier, 1994).

3. Do not make it mandatory to use dictionaries! (See earlier—the last part of the section about stimulating interest in words and things.)

Roots and affixes. Good readers are not usually opposed to the occasional presentation of roots and affixes, but teaching them informally seems most appropriate. By and large, knowledge and use of roots and affixes is a by-product of word knowledge and interest in words, not an avenue to such knowledge and interest. However, 11 prefixes are of some value.

<i>re</i> - again	<i>dis</i> - apart
<i>un</i> - not	<i>in</i> - into
<i>en</i> - in, put into	<i>in</i> - not
<i>ex</i> - out	<i>pre</i> - before
<i>de</i> - away, from	<i>sub</i> - under
<i>com</i> - together, with	

Teaching specific words (direct vocabulary instruction)

In terms of overall growth in meaning vocabulary, the teaching of specific words is least productive; the smallest portion of a student's total meaning vocabulary are those words s/he has been taught explicitly. Thousands more words will be learned from experience. Therefore, those words that are taught explicitly should be those that the student must know in order to be able to understand the content s/he is about to read or study. Commercially prepared lists of words should generally be avoided, for if the words are not soon used, heard, or read, they are forgotten. Five key strategies are useful here.

Teach words in advance of reading. Students learn and retain words and terms that are in their reading materials significantly better if they are taught those words before they read (Jenkins, Stein, & Wysocki,

1984; Nagy et al. 1985; Wittrock, Marks, & Doctorow, 1975). Therefore, things and words in reading texts that might be unknown to students should be determined well in advance of assigning the reading and probably taught before the text is read.

Plan. One aspect of instruction to which teachers do not devote much planning time is vocabulary. The rationale for this appears to be that most teachers know and can readily use the words the students need to learn. But being able to use a word and to teach its meaning and usage are two different things, and teachers frequently find themselves floundering when trying to find terms to explain, describe, or define certain words.

Move from the known to the unknown. In teaching a thing and its word, teachers must always relate the new thing to a word or thing the student already knows (see the Figure). As indicated earlier when quoting Pauling, without this anchoring, association, or reorganization of the conceptual framework that accounts for the new thing, the thing and its word will be relegated to trivial knowledge or forgotten.

Use a variety of methods.

1. Peters (1974–75) experimentally contrasted two methods of teaching concepts (things and their words) and found that the following four steps of instruction (based on a model by Dorothy Frayer, a student of Klausmeier's) led to significantly better learning of concepts than did the traditional textbook method.

► Define the thing's *relevant attributes* (i.e., where it belongs in the world of things or the intrinsic qualities common to all examples of this thing).

► State its *irrelevant attributes* (i.e., qualities or specific types that are not endemic to all examples of the thing).

► State *nonexamples* (i.e., plausible alternatives to test the student to see if s/he has learned the distinguishing characteristics).

► State its *relation to similar concepts*.

Example: *atoll*

Relevant attributes: island that is ring shaped, made of coral, and encircles a lagoon.

Irrelevant attributes: size, location (which ocean), inhabited/noninhabited.

Table 3
An example of a synonymic web: *dull*

Various meanings:	not sharp	not shiny	boring	stupid	not active
Synonyms:	blunt not keen	lackluster not bright muted subdued	repetitive uneventful vapid	dumb obtuse doltish dense	sluggish lethargic slow not brisk

Nonexamples: coral reef, desert island, Hawaii, North America.

Relation to similar concepts: relation to islands, peninsulas.

2. Provide examples of the thing: e.g., for the word *doublet* (meaning two words derived from the same source), display *canal* and *channel* or *fragile* and *frail*.

3. Provide pictures of the thing.

4. Provide synonyms of the thing: e.g.; *somnambulism* is sleepwalking, but explain the shades of difference between the two. Be sure the synonym is known: i.e., do not use a harder word to explain an easier word, as for example, using *rebel* to define *resist*. Use synonymic webbing. In a sense, this is similar to a thesaurus. The definitions of a word are separated into categories of various meanings with each category appropriately labeled and each synonym placed in its appropriate category. See Nagy (1988) and the example in Table 3 for an elaboration on this method.

5. Display and demonstrate antonyms (i.e., opposites); e.g., Bill was *strong*, but Mike was *frail*. Be sure the synonym or antonym is known (e.g., using the antonym *rebellious* to teach *obedient* may not work, as *rebellious* is not a common or easy word).

6. Compare and contrast; e.g., *A good sport*, like a modest person, does not seek praise.

7 Use semantic webbing:

➤ Choose a word from the selection to be read that represents the main idea or main subject of the selection. Write it on the board.

➤ Develop a list of words associated with this word. Students can do this on their own, in several small groups, or as a group with teacher.

➤ Arrange these words on the board thematical-

ly or in a schema (framework or conceptual framework)—putting words that are related (possibly synonyms) together and separating each group of related words from other groups of related words. Teachers must be sure that they include in these groupings those words they think must be understood in order to comprehend the text to be read. Each word that is included need not be defined and discussed, as that would take too much time. Those words that the teacher previously determined as necessary to know in order to comprehend the text must, of course, be defined and discussed in terms of its placement within the schema. See example in Table 4 on the following page.

➤ Students then identify and name categories, with assistance from teacher if necessary. For this example, the following category names might suffice: ways wars stop; types of soldiers; types of people involved in the U.S. Civil War; army moves or tactics; weapons; topography or terrain.

Frequently use the word in oral and written contexts. No thing or word, whether it has been taught specifically in class, seen in written context, or heard in oral context, is likely to be learned after only one encounter. The word must be used numerous times—that is, teachers must use it in their oral language, texts must be presented that use the word, students must be encouraged to use the word in their own oral language, and teachers must encourage the use of the new words in ordinary writing assignments. Therefore, teachers must keep a mental or written list of the things and words taught during the year and attempt to use them and encourage their students to use them in their speaking and writing.

Table 4
An example of a schema: *The U.S. Civil War*

cease-fire	deserter	rebel	charge	musket	ridge
white flag	straggler	Yankee	retreat	rifle	plateau
truce	brave	abolitionist	line	cannon	terrain
surrender	hero	slave holder	outflank	saber	wash
	turncoat	carpetbagger	front	bayonet	mesa

Lasting results

Ultimately, the two primary functions of school are the formal presentation of new knowledge and helping students to develop the strategies and motivation necessary to acquire further knowledge independently. As we have seen throughout this article, both functions depend heavily upon the student's ability to learn new things and their words. The model presented in the Figure suggests a framework for conceptualizing the relation of things and words within an individual learner, while Table 1 displays how teachers might match their instructional methods to the learner's prior knowledge of the thing to be taught. The teaching strategies presented suggest ways to actualize that model in order to facilitate teaching meaning vocabulary. Regardless of content area, few other activities will have as long-lasting an impact on our students' lives as how well we teach those strategies and attitudes that enable students to learn—and enjoy—things and the words that signify them.

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