There is a strong connection between vocabulary knowledge and reading comprehension. If students are not familiar with most words they meet in print, they will undoubtedly have trouble understanding what they read. Long words bothered Pooh, probably as much as technical vocabulary—words unique to a content area—bother students who are not familiar with the content they are studying in an academic discipline. The more experience students have with unfamiliar words...
and the more exposure they have to them, the more meaningful (and less bothersome) the words will become.

Vocabulary is as unique to a content area as fingerprints are to a human being. A content area is distinguishable by its language, particularly the technical terms that label the concepts undergirding the subject matter. Teachers know they must do something with the language of their content areas, but they often reduce instruction to routines that direct students to look up, define, memorize, and use content-specific words in sentences. Such practices divorce the study of vocabulary from an exploration of the subject matter. Learning vocabulary becomes an activity in itself—a separate one—rather than an integral part of learning academic content. Content area vocabulary must be taught well enough to remove potential barriers to students’ understanding of texts in content areas. The organizing principle underscores the main premise of the chapter: Teaching words well means giving students multiple opportunities to learn how words are conceptually related to one another in the texts they are studying.
Fridays always seemed to be set aside for quizzes when we were students. And one of the quizzes most frequently given was the vocabulary test: “Look up these words for the week. Write out their definitions and memorize them. Then use each word in a complete sentence. You’ll be tested on these terms on Friday.”

Our vocabulary study seemed consistently to revolve around the dull routines of looking up, defining, and memorizing words and using them in sentences. Such an instructional pattern resulted in meaningless, purposeless activity—an end in itself, rather than a means to an end. Although there was nothing inherently wrong with looking up, defining, and memorizing words and using them in sentences, the approach itself was too narrow for us to learn words in depth. Instead, we memorized definitions to pass the Friday quiz—and forgot them on Saturday.

Having students learn lists of words is based on the ill-founded notion that the acquisition of vocabulary is separate from the development of ideas and concepts in a content area. Teaching vocabulary often means assigning a list of words rather than exploring word meanings and relationships that contribute to students’ conceptual awareness and understanding of a subject. Once teachers clarify the relationship between words and concepts, they are receptive to instructional alternatives.

Teaching words well removes potential barriers to reading comprehension and supports students’ long-term acquisition of language in a content area. Teaching words well entails helping students make connections between their prior knowledge and the vocabulary to be encountered in the text, and providing them with multiple opportunities to clarify and extend their knowledge of words and concepts during the course of study.

To begin, let’s explore the connections that link direct experience to concepts and words. Understanding these connections lays the groundwork for teaching words, with the emphasis on learning concepts. As An-
derson and Freebody (1981) suggest, “Every serious student of reading recognizes that the significant aspect of vocabulary development is in the learning of concepts, not just words” (p. 87).

Experiences, Concepts, and Words

Words are labels for concepts. A single concept, however, represents much more than the meaning of a single word. It may take thousands of words to explain a concept. However, answers to the question, “What does it mean to know a word?” depend on how well we understand the relationships among direct experiences, concepts, and words.

Concepts are learned by acting on and interacting with the environment. Students learn concepts best through direct, purposeful experiences. Learning is much more intense and meaningful when it is firsthand. However, in place of using direct experience (which is not always possible), we develop and learn concepts through various levels of contrived or vicarious experience. According to Dale (1969), learning a concept through oral or written language is especially difficult because this kind of learning is so far removed from direct experience.

What Are Concepts?

Concepts create mental images, which may represent anything that can be grouped together by common features or similar criteria: objects, symbols, ideas, processes, or events. In this respect, concepts are similar to schemata. A concept hardly ever stands alone; instead, it is bound by a hierarchy of relationships. As a result, “most concepts do not represent a unique object or event but rather a general class linked by a common element or relationship” (Johnson & Pearson 1984, p. 33).

Bruner, Goodnow, and Austin (1977) suggest that we would be overwhelmed by the complexity of our environment if we were to respond to each object or event that we encountered as unique. Therefore, we invent categories (or form concepts) to reduce the complexity of our environment and the necessity for constant learning. For example, every feline need not have a different name; each is known as a cat. Although cats vary greatly, their common characteristics cause them to be referred to by the same general term. Thus, to facilitate communication, we invent words to name concepts.

Concept Relationships: An Example

Consider your concept for the word ostrich. What picture comes to mind? Your image of an ostrich might differ from ours, depending on your prior knowledge
of the ostrich or the larger class to which it belongs, generally referred to as land birds. Moreover, your direct or vicarious experiences with birds may differ significantly from someone else’s. Nevertheless, for any concept, we organize all our experiences and knowledge into conceptual hierarchies according to class, example, and attribute relations.

2. Invite students to evaluate their level of understanding of the keywords on the Knowledge Rating sheet.

3. Engage in follow-up discussion, asking the class to consider questions such as, “Which are the hardest words? Which do you think most of the class doesn’t know? Which words do most of us know?” Encourage the students to share what they know about the words and to make predictions about their meanings.

4. Use the self-assessment to establish purposes for reading. Ask, “About what do you think this chapter/unit is going to be?”

5. As students engage in chapter/unit study, refer to the words on the Knowledge Rating sheet as they are used in text. Have students compare their initial word meaning predictions with what they are learning as they read.
The concept ostrich is part of a more inclusive class or category called land birds, which is in turn subsumed under an even larger class of animals known as warm-blooded vertebrates. These class relations are depicted in Figure 8.1.

In any conceptual network, class relationships are organized in a hierarchy consisting of superordinate and subordinate concepts. In Figure 8.1, the superordinate
concept is animal kingdom. Vertebrates and invertebrates are two classes within the animal kingdom; they are in a subordinate position in this hierarchy. Vertebrates, however—divided into two classes, warm-blooded and cold-blooded—are superordinate to mammals, birds, fish, and amphibians, which are types or subclasses of vertebrates. The concept land birds, subordinate to birds but superordinate to ostrich, completes the hierarchy.

For every concept, there are examples. An example is a member of any concept being considered. Class–example relations are complementary: Vertebrates and invertebrates are examples within the animal kingdom; mammals, birds, fish, and amphibians are examples of vertebrates; land birds are one example of birds; and so on.

Let’s make land birds our target concept. What are some other examples of land birds in addition to the ostrich? Penguin, emu, and rhea are a few, as shown in Figure 8.2. We could have listed more examples of land birds. Instead, we now ask, “What do the ostrich, penguin, emu, and rhea have in common?” This question allows us to focus on their relevant attributes, the features, traits, properties, or characteristics common to every example of a particular group. In this case, the relevant attributes of land birds are the characteristics that determine whether the ostrich, penguin, emu, and rhea belong to the class of birds called land birds. An attribute is said to be critical if it is a characteristic that is necessary to class membership. An attribute is said to be variable if it is shared by some but not all examples of the class.
Thus, we recognize that certain physical and social characteristics are shared by all land birds but that not every land bird has each feature. Virtually all land birds have feathers, wings, and beaks. They hatch from eggs and have two legs. They differ in color, size, habitat, and size of feet. Some land birds fly, and others, with small wings that cannot support their bodies in the air, do not. In what ways is the ostrich similar to other land birds? How is the ostrich different?

This brief discussion illustrates an important principle: **Teachers can help students build conceptual knowledge of content area terms by teaching and reinforcing the concept words in relation to other concept words.** This key instructional principle plays itself out in content area classrooms whenever students are actively making connections among the keywords in a lesson or unit of study.

### Using Graphic Organizers to Make Connections among Key Concepts

At the start of each chapter, we have asked you to use a “chapter overview” to organize your thoughts around the main ideas in the text. These ideas are presented within the framework of a graphic organizer, a diagram that uses content vocabulary to help students anticipate concepts and their relationships to one another in the reading material. These concepts are displayed in an arrangement of key technical terms relevant to the important concepts to be learned.

Graphic organizers may vary in format. One commonly used format to depict the hierarchical relationships among concept words is a “network tree” diagram. Keep in mind, network tree graphic organizers always...
show concepts in relation to other concepts. Let’s take a closer look at how to construct and apply graphic organizers in the classroom. Box 8.2 outlines several steps to follow for developing and using a graphic organizer as a before-reading activity.

A Graphic Organizer Walk-Through

Suppose you were to develop a graphic organizer for a text chapter in a high school psychology course. Let’s walk through the steps involved.

1. **Analyze the vocabulary, and list the important words.** The chapter yields these words:
   - hebephrenia
   - neurosis
   - personality disorders
   - psychosis
   - schizophrenia
   - catatonia
   - abnormality
   - mental retardation
   - phobias

2. **Arrange the list of words.** Choose the word that represents the most inclusive concept, the one superordinate to all the others. Then choose the words

   *Barron (1969) suggests the following steps for developing the graphic organizer and introducing the vocabulary diagram to students:*

   1. **Analyze the vocabulary of the learning task.** List all the words that you believe are important for the student to understand.
   2. **Arrange the list of words until you have a scheme that shows the interrelationships among the concepts particular to the learning task.**
   3. **Add to the scheme vocabulary.** Add terms that you believe the students understand in order to show the relationships between the learning task and the discipline as a whole.
   4. **Evaluate the organizer.** Have you clearly shown major relationships? Can the organizer be simplified and still effectively communicate the idea you consider crucial?
   5. **Introduce the students to the learning task by showing them the scheme.** Tell them why you arranged the terms as you did. Encourage them to contribute as much information as possible to the discussion of the organizer.
   6. **As you complete the learning task, relate new information to the organizer where it seems appropriate.**

   *Barron (1969)*
classified immediately under the superordinate concept, and coordinate them with one another. Then choose the terms subordinate to the coordinate concepts. Your diagram may look like Figure 8.3.

3. **Add to the scheme vocabulary terms that you believe the students understand.** You add the following terms: *antisocial, anxiety, intellectual deficit, Walter Mitty, depression, paranoia.* Where would you place these words on the diagram?

4. **Evaluate the organizer.** The interrelationships among the key terms may look like Figure 8.4 once you evaluate the vocabulary arrangement.
5. **Introduce the students to the learning task.** As you present the vocabulary relationships shown on the graphic organizer, create as much discussion as possible. Draw on students’ understanding of and experience with the concepts the terms label. You might have students relate previous study to the terms. For example, *Walter Mitty* is subsumed under *hebephrenia*. Students who are familiar with James Thurber’s short story “The Secret Life of Walter Mitty” would have little trouble bringing meaning to *hebephrenia*: a schizophrenic condition characterized by excessive daydreaming and delusions. The discussion might also lead to a recognition of the implicit comparison-and-contrast pattern of the four types of abnormality explained in the text. What better opportunity to provide direction during reading than to have students visualize the pattern? The discussions you will stimulate with the organizer will be worth the time it takes to construct it.

6. **As you complete the learning task, relate new information to the organizer.** This step is particularly useful as a study and review technique. The organizer becomes a study guide that can be referred to throughout the discussion of the material. Students should be encouraged to add information to flesh out the organizer as they develop concepts more fully.

Use a graphic organizer to show the relationships in a thematic unit, in a chapter, or in a subsection of a chapter. Notice how the graphic organizer in Figure 8.5, developed for a high school class in data processing, introduced students to the different terms of data processing, delineating causes and effects.

An art teacher used Figure 8.6 to show relationships among types of media used in art. She used an artist’s palette rather than a tree diagram. After com-

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**Figure 8.5** A Graphic Organizer for Data Processing

![Graphic Organizer for Data Processing](image)
pleting the entries for paint and ceramics herself, the teacher challenged her stu-
dents to brainstorm other media that they had already used or knew about and to
provide examples; she used the open areas on the palette to record students’
associations.

Graphic organizers are easily adapted to learning situations in the elementary
grades. For class presentation, elementary teachers often construct organizers on
large sheets of chart paper or on bulletin boards. Other teachers introduce voca-
bulary for content units by constructing mobiles they hang from the ceiling.
Hanging mobiles are an interest-riveting way to attract students’ attention to the
hierarchical relationships among the words they will encounter. Still other ele-
mentary teachers draw pictures with words that illustrate the key concepts un-
der study.

**Showing Students How to Make Their Own Connections**

Graphic organizers may be used by teachers to build a frame of reference for
students as they approach new material. However, in a more student-centered
adaptation of the graphic organizer, the students work in cooperative groups and organize important concepts into their own graphic representations.

To make connections effectively, students must have some familiarity with the concepts in advance of their study of the material. In addition, student-constructed graphic organizers presume that the students are aware of the idea behind a graphic organizer. If they are not, you will need to give them a rationale and then model the construction of an organizer. Exposure to teacher-constructed graphic organizers from past lessons also creates awareness and provides models for the instructional strategy.

To introduce students to the process of making their own graphic organizers, follow these steps, adapted from Barron and Stone (1973):

1. **Type the keywords and make copies for students.**
2. **Have them form small groups of two or three students each.**
3. **Distribute the list of terms and a packet of 3-by-5-inch index cards to each group.**
4. **Have the students write each word from the list on a separate card.** Then have them work together to decide on a spatial arrangement of the cards that depicts the major relationships among the words.
5. **As students work, provide assistance as needed.**
6. **Initiate a discussion of the constructed organizer.**

Before actually assigning a graphic organizer to students, you should prepare for the activity by carefully analyzing the vocabulary of the material to be learned. List all the terms that are essential for students to understand. Then add relevant terms that you believe the students already understand and will help them relate what they know to the new material. Finally, construct your own organizer.

The form of the student-constructed graphic organizer will undoubtedly differ from the teacher’s arrangement. However, this difference in and of itself should not be a major source of concern. What is important is that the graphic organizer support students’ abilities to anticipate connections through the key vocabulary terms in content materials.

### Activating What Students Know about Words

Graphic organizers may be used to (1) activate students’ prior knowledge of the vocabulary words in a text assignment or unit of study and (2) clarify their un-
derstanding of concepts as they study text. From a strategy perspective, students need to learn how to ask the question, “What do I know about these words?” When you use graphic organizers before reading or talking about key concepts, help the students build strategy awareness by exploring key terms before assigning text to read. In addition, consider the use of a quasi-instructional/informal assessment strategy known as Knowledge Rating (Blachowicz & Fisher 1996). For an explanation of the Knowledge Rating strategy, see Box 8.1. In addition to graphic organizers and knowledge ratings, there are several instructional activities that you can use to scaffold student’s exploration of words.

**Word Exploration**

Word exploration is a writing-to-learn strategy that works well as a vocabulary activity. Before asking students to make connections between the words and their prior knowledge, a biology teacher asked them to explore what they knew about the concept of natural selection by writing in their learning logs.

A word exploration activity invites students to write quickly and spontaneously, a technique called freewriting, for no more than five minutes, without undue concern about spelling, neatness, grammar, or punctuation. The purpose of freewriting is to get down on paper everything that students know about the topic or target concept. Students write freely for themselves, not for an audience, so the mechanical, surface features of language, such as spelling, are not important.

Word explorations activate schemata and jog long-term memory, allowing students to dig deep into the recesses of their minds to gather thoughts about a topic. Examine one of the word explorations for the target concept natural selection:

Natural selection means that nature selects—kills off—does away with the weak so only the strong make it. Like we were studying in class last time things get so competitive even among us for grades and jobs etc. The homeless are having trouble living with no place to call home except the street and nothing to eat. That’s as good an example of natural selection as I can think of for now.

The teacher has several of the students share their word explorations with the class, either reading them verbatim or talking through what they have written, and notes similarities and differences in the students’ concepts. The teacher then relates their initial associations to the concept and asks the students to make further connections: “How does your personal understanding of the idea natural selection fit in with some of the relationships that you see?”

**Brainstorming**

An alternative to word exploration, brainstorming is a procedure that quickly allows students to generate what they know about a key concept. In brainstorming, the students can access their prior knowledge in relation to the target concept.
Brainstorming involves two basic steps that can be adapted easily to content objectives: (1) The teacher identifies a key concept that reflects one of the main topics to be studied in the text, and (2) students work in small groups to generate a list of words related to the concept in a given number of seconds.

These two steps help you discover almost instantly what your students know about the topic they are going to study. Furthermore, Herber (1978) suggests that the device of having students produce lists of related words is a useful way to guide review. It helps them become instantly aware of how much they know, individually and collectively, about the topic. They discover quickly that there are no right or wrong answers. . . . Until the students reach the point in the lesson where they must read the passage and judge whether their predictions are accurate, the entire lesson is based on their own knowledge, experience, and opinion. This captivates their interest much more than the more traditional, perfunctory review. (p. 179)

**List–Group–Label**

Hilda Taba (1967) suggests an extension of brainstorming that she calls “list–group–label.” When the brainstorming activity is over, and lists of words have been generated by the students, have the class form learning teams to group the words into logical arrangements. Then invite the teams to label each arrangement. Once the list–group–label activity is completed, ask the students to make predictions about the content to be studied. You might ask, “Given the list of words and groupings that you have developed, about what do you think we will be reading and studying? How does the title of the text (or the thematic unit) relate to your groups of words? Why do you think so?”

A teacher initiated a brainstorming activity with a class of “low-achieving learners.” The students, working in small groups, were asked to list in two minutes as many words as possible that were related to the Civil War. Then the groups shared their lists of Civil War words. The teacher then created a master list on the board from the individual entries of the groups. He also wrote three categories on the board—“North,” “South,” and “Both”—and asked the groups to classify each word from the master list under one of the categories. Here’s how one group responded:

<table>
<thead>
<tr>
<th>NORTH</th>
<th>SOUTH</th>
<th>BOTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue</td>
<td>gray</td>
<td>soldiers</td>
</tr>
<tr>
<td>Lincoln</td>
<td>farms</td>
<td>armies</td>
</tr>
<tr>
<td>Grant</td>
<td>Rebel</td>
<td>guns</td>
</tr>
<tr>
<td>factories</td>
<td>Booth</td>
<td>cannons</td>
</tr>
<tr>
<td>Yankee</td>
<td>slavery</td>
<td>Gettysburg Address</td>
</tr>
<tr>
<td>Ford Theater</td>
<td></td>
<td>roots</td>
</tr>
<tr>
<td>victory</td>
<td></td>
<td>death</td>
</tr>
<tr>
<td></td>
<td></td>
<td>horses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>assassination</td>
</tr>
</tbody>
</table>
Note that in this example, the teacher provided the categories. He recognized that students needed the additional structure to be successful with this particular task. The activity led to a good deal of discussion and debate. Students were put in the position of “authority,” sharing what they knew and believed already with other class members. As a result of the activity, they were asked to raise questions about the Civil War that they wanted to have answered through reading and class discussion.

**Semantic Word Maps**

Semantic word maps spatially depict relationships among words. The use of semantic word maps may include brainstorming and the use of collaborative small groups. Semantic word maps allow students to cluster words belonging to categories and to distinguish relationships among words. Here’s how semantic mapping works:

1. The teacher or the students decide on a key concept to be explored.
2. Students suggest related terms and phrases. Once the key concept is determined, the students, depending on what they have been studying and on their background knowledge and experiences, offer as many words or phrases as possible related to the concept term. These are recorded by the teacher on the chalkboard.

Once the list of terms is generated, the teacher may form small groups of students to create semantic maps and then to share their constructions in class discussion. Such was the case in a woods technology class exploring the concept of solvents in relation to choosing different kinds of wood finishes. The semantic map created by one of the small groups in the class is shown in Figure 8.7.

Teachers will need to model the construction of semantic maps once or twice so that students will get a feel for how to develop their own in small groups or individually. In Chapter 12, we expand on the use of semantic maps as an after-reading learning strategy used by students to outline content material as they study texts.

**Word Sorts**

Like brainstorming, word sorts require students to classify words into categories based on their prior knowledge. However, unlike brainstorming, students do not generate a list of words for a target concept. Instead, the teacher identifies the key words from the unit of study and invites the students to sort them into logical arrangements of two or more.

A word sort is a simple yet valuable activity. Individually or in small groups, students literally sort out technical terms that are written on cards or
listed on an exercise sheet. The object of word sorting is to group words into different categories by looking for shared features among their meanings. According to Gillet and Kita (1979), a word sort gives students the opportunity “to teach and learn from each other while discussing and examining words together” (pp. 541–542).

Gillet and Kita (1979) also explain that there are two types of word sorts: the open sort and the closed sort. Both are easily adapted to any content area. In the closed sort, students know in advance of sorting what the main categories are. In other words, the criterion that the words in a group must share is stated. In a middle grade music class, students were studying the qualities of various “instrumental families” of the orchestra. The music teacher assigned the class to work in pairs to sort musical instruments into four categories representing the major orchestral families: strings, woodwinds, brass, and percussion. Figure 8.8 represents the closed sort developed by one collaborative “think–pair–share” group.

Open sorts prompt divergent and inductive reasoning. No category or criterion for grouping is known in advance of sorting. Students must search for meanings and discover relationships among technical terms without the benefit of any structure.

Study how an art teacher activated what students knew about words associated with pottery making by using the open word sort strategy. She asked the high school students to work in collaborative pairs to arrange the following words into possible groups and to predict the concept categories in which the words would be classified:

**Semantic Map for Solvents**

- Brushing lacquer
- Lacquer thinner
- Alcohol
- Shellac
- Varnish stain
- Natural varnish
- Polyurethane
- Oil
- Enamel
- Water
- Paint
- Lacquer nitrocellulose
- Solvents
- Lacquer nitrocellulose
- Varnish stain
- Natural varnish
- Polyurethane
- Oil
- Enamel
- Water
- Paint
Three categories that students formed were types of clay, pottery tools, and coloring agents.

Open word sorts can be used before or after reading. Before reading, a word sort serves as an activation strategy to help learners make predictive connections among the words. After reading, word sorts enable students to clarify and extend their understanding of the conceptual relationships.

**Reinforcing and Extending Vocabulary Knowledge and Concepts**

Students need many experiences, real and vicarious, to develop word meanings and concepts. They need to use, test, and manipulate technical terms in instructional situations that capitalize on reading, writing, speaking, and listening. In having students do these things, you create the kind of natural language environment that is needed to extend vocabulary and concept development. Various vocabulary extension activities can be useful in this respect.

---

**FIGURE 8.8 Closed Sort for Musical Instruments**

<table>
<thead>
<tr>
<th>Strings (Bow or Struck)</th>
<th>Woodwinds (Single or Double Reed)</th>
<th>Brass (Lips Vibrate in Mouthpiece)</th>
<th>Percussion (Sounds of Striking)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin</td>
<td>Flute</td>
<td>Trumpet</td>
<td>Timpani</td>
</tr>
<tr>
<td>Viola</td>
<td>Piccolo</td>
<td>Trombone</td>
<td>Bass drum</td>
</tr>
<tr>
<td>Cello</td>
<td>Oboe</td>
<td>French Horn</td>
<td>Chimes</td>
</tr>
<tr>
<td>Harp</td>
<td>Clarinet</td>
<td></td>
<td>Xylophone</td>
</tr>
<tr>
<td></td>
<td>Saxophone</td>
<td></td>
<td>Bells</td>
</tr>
<tr>
<td></td>
<td>Bassoon</td>
<td></td>
<td>Triangle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Snare drum</td>
</tr>
</tbody>
</table>

jordan lead Cornwall stone sgraffito
ball chrome cone roka
antimony slip wheel leather
cobalt scale bisque hard
mortar kaolin stoneware oxidation
These activities should be completed individually by students and then discussed either in small groups or in the class as a whole. The oral interaction in team learning gives more students a chance to use terms. Students can exchange ideas, share insights, and justify responses in a nonthreatening situation.

**Semantic Feature Analysis (SFA)**

Semantic feature analysis (SFA) establishes a meaningful link between students’ prior knowledge and words that are conceptually related to one another. The strategy requires that you develop a chart or grid to help students analyze similarities and differences among the related concepts. As the SFA grid in Figure 8.9 illustrates, a topic or category (in this case, properties of quadrilaterals) is selected, words related to that category are written across the top of the grid, and features or properties shared by some of the words in the column are listed down the left side of the grid.

Students analyze each word, feature by feature, writing Y (yes) or N (no) in each cell of the grid to indicate whether the feature is associated with the word. Students may write a question mark (?) if they are uncertain about a particular feature.

**FIGURE 8.9 An SFA for Geometry**

*Directions:* Determine which of these properties is found in the four quadrilaterals listed. Mark “Y” or “N” in each box.

<table>
<thead>
<tr>
<th></th>
<th>Parallelogram</th>
<th>Rectangle</th>
<th>Rhombus</th>
<th>Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagonals bisect each other.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagonals are congruent.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Each diagonal bisects a pair of opposite angles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagonals form two pairs of congruent triangles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagonals form four congruent triangles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagonals are perpendicular to each other.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As a teaching activity, SFA is easily suited to before- or after-reading instructional routines. If you used it before reading to activate what students know about words, recognize that they can return to the SFA after reading to clarify and re-formulate some of their initial responses on the SFA grid.

Categorization Activities

Vocabulary extension exercises involving categorization require students to determine relationships among technical terms much as word sorts do. Students are usually given four to six words per grouping and asked to do something with them. That something depends on the format used in the exercise. For example, you can give students sets of words and ask them to circle in each set the word that includes the others. This exercise demands that students perceive common attributes or examples in relation to a more inclusive concept and to distinguish superordinate from subordinate terms. Following is an example from an eighth-grade social studies class.

**Directions:** Circle the word in each group that includes the others.

1. government  
council  
judges  
governor
2. throne  
coronation  
crown  
church

A variation on this format directs students to cross out the word that does not belong and then to explain in a word or phrase the relationship that exists among the common items, as illustrated in the following example.

**Directions:** Cross out the word in each set that does not belong. On the line above the set, write the word or phrase that explains the relationship among the remaining three words.

1. _______  
drama  
comedy  
epic  
tragedy  
2. _______

time  
character  
place  
action

Concept Circles

One of the most versatile activities we have observed at a wide range of grade levels is the concept circle. Concept circles provide still another format and opportunity
for studying words critically—for students to relate words conceptually to one another. A concept circle may simply involve putting words or phrases in the sections of a circle and directing students to describe or name the concept relationship among the sections. The example in Figure 8.10 is from a middle grade science lesson.

In addition, you might direct students to shade in the section of a concept circle containing a word or phrase that does not relate to the words or phrases in the other sections of the circle and then identify the concept relationships that exist among the remaining sections (see Figure 8.11).

Finally, you can modify a concept circle by leaving one or two sections of the circle empty, as in Figure 8.12. Direct students to fill in the empty section with a word or two that relates in some way to the terms in the other sections of the concept circles. Students must then justify their word choice by identifying the overarching concept depicted by the circle.

As you can see, concept circles serve the same function as categorization activities. However, students respond positively to the visual aspect of manipulating the sections in a circle. Whereas categorization exercises sometimes seem like tests to students, concept circles are fun to do.

**Context- and Definition-Related Activities**

Artley (1975) captured the role that context plays in vocabulary learning: “It is the context in which the word is embedded rather than the dictionary that gives
it its unique flavor” (p. 1072). Readers who build and use contextual knowledge are able to recognize fine shades of meaning in the way words are used. They know the concept behind the word well enough to use that concept in different contexts.
In Chapter 4, we explored the role of context clues in helping English language learners and struggling readers to figure out the meanings of unknown words that they encounter in text. In addition to context clues, struggling readers and English language learners will find context-related activities, such as those described in Box 8.3, particularly helpful.

**Modified Cloze Passages and OPIN**

Students who struggle with text or have limited English proficiency may benefit from context-related activities. Two such activities, modified cloze passages and OPIN, help students make meaning around key words in a text.

**MODIFIED CLOZE PASSAGES**

Cloze passages (discussed in Chapter 2) can be created to reinforce technical vocabulary. However, the teacher usually modifies the procedure for teaching purposes. Every nth word, for example, needn’t be deleted. The modified cloze passage will vary in length. Typically, a 200- to 500-word text segment yields sufficient technical vocabulary to make the activity worthwhile.

Should you consider developing a modified cloze passage on a segment of text from a reading assignment, make sure that the text passage is one of the most important parts of the assignment. Depending on your objectives, students can supply the missing words either before or after reading the entire assignment. If they work on the cloze activity before reading, use the subsequent discussion to build meaning for key terms and to raise expectations for the assignment as a whole. If you assign the cloze passage after reading, it will reinforce concepts attained through reading.

On completing a brief prereading discussion on the causes of the Civil War, an American history teacher assigned a cloze passage before students read the entire introduction for homework. See how well you fare on the first part of the exercise.

What caused the Civil War? Was it inevitable? To what extent and in what ways was slavery to blame? To what extent was each region of the nation at fault? Which were more decisive—the intellectual or the emotional issues?

Any consideration of the [1] of the war must include the problem of [2]. In his second inaugural address, Abraham Lincoln said that slavery was “somehow the cause of the war.” The critical word is [3]. Some [4] maintain that the moral issue had to be solved, the nation had to face the [5], and the slaves had to be [6]. Another group of historians asserts that the war was not fought over [7]. In their view, slavery served as an [8] focal point for more fundamental [9] involving two different [10] of the Constitution. All of these views have merit, but no single view has won unanimous support.

(Answers can be found at the end of this chapter on page 292.)
**Magic Squares**

The magic square activity is by no means new or novel, yet it has a way of reviving even the most mundane matching exercise. We have seen the magic square used successfully in elementary and secondary grades as well as in graduate courses. Here’s how a magic square works. An activity sheet has two columns, one for content area terms and one for definitions or other distinguishing statements.

**OPIN**

OPIN provides another example of context-based reinforcement and extension. OPIN stands for opinion and also plays on the term cloze.

Here’s how OPIN works. Divide the class into groups of three. Distribute exercise sentences, one to each student. Each student must complete each exercise sentence individually. Then each group member must convince the other two members that his or her word choice is the best. If no agreement is reached on the best word for each sentence, each member of the group can speak to the class for his or her individual choice. When all groups have finished, have the class discuss each group’s choices. The only rule of discussion is that each choice must be accompanied by a reasonable defense or justification. Answers such as “Because ours is best” are not acceptable.

OPIN exercise sentences can be constructed for any content area. Here are sample sentences from science, social studies, and family and consumer studies:

**SCIENCE**

1. A plant’s _______ go into the soil.
2. The earth gets heat and _______ from the sun.
3. Some animals, such as birds and _______, are nibblers.

**SOCIAL STUDIES**

1. We cannot talk about _______ in America without discussing the welfare system.
2. The thought of _______ or revolution would be necessary because property owners would fight to hold on to their land.
3. Charts and graphs are used to _______ information.

**FAMILY AND CONSUMER STUDIES**

1. Vitamin C is _______ from the small intestine and circulates to every tissue.
2. Washing time for cottons and linens is eight to ten minutes unless the clothes are badly _______.

(Answers can be found at the end of the chapter on page 292.)

OPIN encourages differing opinions about which word should be inserted in a blank space. In one sense, the exercise is open to discussion, and as a result, it reinforces the role of prior knowledge and experiences in the decisions that each group makes. The opportunity to “argue” one’s responses in the group leads not only to continued motivation but also to a discussion of word meanings and variations.
such as characteristics or examples (see Figure 8.13). Direct students to match terms with definitions. In doing so, they must take into account the letters signaling the terms and the numbers signaling the definitions. The students then put the number of a definition in the proper space (denoted by the letter of the term) in the “magic square answer box.” If their matchups are correct, they will form a magic square. That is, the numerical total will be the same for each row across and 

**Figure 8.13 Magic Square on Care of Clothing**

**Directions:** Select the best answer for each of the laundering terms from the numbered definitions. Put the number in the proper space in the magic square box. If the totals of the numbers are the same both across and down, you have found the magic number!

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Soil release</td>
<td>2. Fabric must maintain finish for up to fifty machine washings.</td>
</tr>
<tr>
<td>C. Water repellent</td>
<td>3. Ability to protect against redeposition of soil on fabrics.</td>
</tr>
<tr>
<td>D. Flame retardant</td>
<td>4. Turn inside out to avoid snags.</td>
</tr>
<tr>
<td>E. Knitted fabrics</td>
<td>5. Resists stains, rain, and dampness.</td>
</tr>
<tr>
<td>G. Pretreating</td>
<td>7. Resists wrinkling during wear and laundering.</td>
</tr>
<tr>
<td>H. Sorting</td>
<td>8. Separate clothes into suitable washloads.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Answer Box</th>
<th>Magic number = _______</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td></td>
</tr>
</tbody>
</table>
each column down the answer box. This total forms the puzzle’s “magic number.” Students need to add up the rows and columns to check if they’re coming up with the same number each time. If not, they should go back to the terms and definitions to reevaluate their answers.

The magic square exercise in Figure 8.13 is from a family and consumer studies class. Try it. Its magic number is 15. Analyze the mental maneuvers that you went through to determine the correct number combinations. In some cases, you undoubtedly knew the answers outright. You may have made several educated guesses on others. Did you try to beat the number system? Imagine the possibilities for small-group interaction.

Many teachers are intrigued by the possibilities offered by the magic square, but they remain wary of its construction: “I can’t spend hours figuring out number combinations.” This is a legitimate concern. Luckily, the eight combinations in Figure 8.14 make magic square activities easy to construct. You can generate many more combinations from the eight patterns simply by rearranging rows or columns (see Figure 8.15).

Notice that the single asterisk in Figure 8.14 denotes the number of foils needed so that several of the combinations can be completed. For example, the

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**Figure 8.14** A Model of Magic Square Combinations

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 3 5</td>
<td>10 8 6</td>
<td>7 11 8</td>
</tr>
<tr>
<td>2 4 9</td>
<td>2 9 13</td>
<td>10 12 4</td>
</tr>
<tr>
<td>6 8 1</td>
<td>12 7 5</td>
<td>9 3 14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 2 7</td>
<td>9 7 5</td>
<td>5 10 3</td>
</tr>
<tr>
<td>4 6 8</td>
<td>1 8 12</td>
<td>11 6 4</td>
</tr>
<tr>
<td>1 18*</td>
<td>3 21**</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 2 3 13</td>
<td>19 2 15 23 6</td>
<td>2 7 18 12</td>
</tr>
<tr>
<td>5 11 10 8</td>
<td>25 8 16 4 12</td>
<td>8 5 11 15</td>
</tr>
<tr>
<td>9 7 6 12</td>
<td>1 14 22 10 18</td>
<td>13 17 6 3</td>
</tr>
<tr>
<td>4 14 15 1</td>
<td>7 20 3 11 24</td>
<td>16 10 4 9</td>
</tr>
</tbody>
</table>

* Foils needed in answer column
**Magic number
A strong relationship exists between vocabulary knowledge and reading comprehension. In this chapter, we provided numerous examples of what it means to teach words well: giving students multiple opportunities to build vocabulary knowledge, to learn how words are conceptually related to one another, and to learn how they are defined contextually in the material that students are studying. Vocabulary activities provide students the multiple experiences they need to use and manipulate words in different situations. Conceptual and definitional activities provide the framework needed to study words critically. Various types of concept extension activities, such as semantic feature analysis, semantic maps, concept of definition, word sorts, categories, concept circles, word puzzles, and magic squares, reinforce and extend students’ abilities to perceive relationships among the words they are studying.

In the next chapter, our emphasis turns to kindling student interest in text assignments and preparing them to think positively about what they will read. The importance of the role of prereading preparation in learning from text...
has often been neglected or underestimated in the content area classroom. Yet prereading activity is in many ways as important to the text learner as warm-up preparation is to the athlete. Let’s find out why.

**Minds On**

1. A few of your students come to you and ask why they aren’t using dictionaries to help them learn vocabulary words as they did last year. What is your response? Justify your response.

2. Each of the following statements should be randomly assigned to members of your group. Your task with your drawn statement is to play the “devil’s advocate.” Imagine that you are in a conference with other teachers, all of whom have the same child in their classes. One member of the teaching team, represented by the other members of your discussion group, makes the statement you’ve selected, and you totally disagree. Argue to these teachers why you believe this statement is false. Members of the teaching team must respond with counterarguments, using classroom examples for support whenever possible.
   a. Students who are interested and enthusiastic are more likely to learn the vocabulary of a content area subject.
   b. Students need to know how to inquire into the meanings of unknown words by using context analysis and dictionary skills.
   c. An atmosphere for vocabulary reinforcement is created by activities involving speaking, listening, writing, and reading.
   d. Vocabulary reinforcement provides opportunities for students to increase their knowledge of the technical vocabulary of a subject.
   e. Vocabulary taught and reinforced within the framework of concept development enhances reading comprehension.
   f. Vocabulary knowledge and reading comprehension have a strong relationship.

   Were there any statements that you had difficulty defending? If so, pose these to the class as a whole, and solicit perspectives from other groups.

3. Your principal notices that your history class spends a lot of time working in pairs and groups on vocabulary, and she doesn’t understand why this is necessary “just to learn words.” As a group, compose a letter to her explaining the importance of student interaction in learning the vocabulary of any content area.

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**Hands On**

1. The class should be organized into four groups. Two groups will represent alien life forms, and two will represent human beings. Each group meets for fifteen to twenty
minutes. Working separately, each alien group will create five or six statements in their own “alien” language. The humans will organize strategies for decoding the messages they will receive.

After the time has elapsed, each alien group meets with a human group, and the aliens make their statements. If possible, the aliens will attempt to respond to the humans’ questions with keywords or phrases. Next, with the alien and human groups switched, the process is repeated. Finally, as a whole class, discuss your success or lack of success in translating in relation to what you have learned about vocabulary and concepts.

2. Examine the following list of vocabulary words taken from this chapter:
   general vocabulary
technical vocabulary
special vocabulary
concept
word sorts (open, closed)
brainstorming
semantic word maps
knowledge ratings
syntactic and semantic contextual aids
semantic feature analysis
freewriting
modified cloze passages
context

comprehension
conceptual level
concept circles
OPIN
word puzzles
magic squares
prior knowledge
target concept
cognitive operations
joining
excluding
selecting
implying

Team with three other members of the class, and with this list of words, each create one of the following:

a. Two conceptually related activities, such as a set of concept circles and a closed word sort
b. A context activity that presents the key concept words in meaningful sentence contexts
c. A semantic word map or a semantic feature analysis

Follow this activity with a discussion of the advantages and disadvantages of each approach and of the appropriate time during a unit to use each.

Answers to cloze passage

Possible answers to OPIN exercises
Science: 1. roots, 2. radiation, 3. rodents; Social Studies: 1. poverty, 2. violence, 3. organize; Family and Consumer Studies: 1. absorbed, 2. soiled.
Go to Chapter 8 of the Companion Website (www.ablongman.com/vacca8e) and click on Activities to complete the following task:

The following site allows users to create all sorts of word puzzles: http://puzzlemaker.com/. Design a puzzle based on vocabulary words from a chapter of a content area text.

Go to the Companion Website (www.ablongman.com/vacca8e) for suggested readings, interactive activities, multiple-choice questions, and additional Web links to help you learn more about developing vocabulary knowledge and concepts.

Themes of the Times

Extend your knowledge of the concepts discussed in this chapter by reading current and historical articles from the New York Times. Go to the Companion Website and click on eThemes of the Times.