Strategies for Textbook Learning

IN THIS CHAPTER, YOU WILL LEARN

- how to use SQ3R, a reading method specifically created for learning from textbooks.
- what reading strategies are particularly appropriate for textbooks.
- what methods of reading and review might work best for you.
- how to match your reading rate to the material.
- how to use the World Wide Web to expand your background knowledge.

“Learning without thought is labor lost.”
—Confucius
Because it was created more than half a century ago, SQ3R, the system for learning from textbooks introduced in this chapter, has sometimes been called obsolete, or out of date. But, in fact, Francis P. Robinson, the educational psychologist who created SQ3R in the 1940s, spent years teaching both college students and military personnel how to learn from textbooks. His system, if used consistently, can still produce big rewards. Although it needs some modifications, which you will learn about in the pages that follow, SQ3R (or one of the various study systems based on it†) will significantly boost your learning from textbooks as long as you use it on a consistent basis.

Chapter 1 also emphasizes the importance of writing while reading as a way of improving not just comprehension but remembering as well. In addition, you will learn how to vary your reading rate when completing your textbook assignments: You'll learn when to speed up and when to slow down. Finally, the chapter offers some suggestions for using the World Wide Web to expand your background knowledge and prepare for reading before starting your reading assignments.

Introducing SQ3R: Survey, Question, Read, Recall, Review

If you are reading a bestseller by a writer like Dan Brown† or Stephenie Meyer,† you more than likely let your mind drift along with the story, almost like you were dreaming it. However, this dreamy, unfocused approach, perfect for leisure reading, is not appropriate for textbooks. With textbooks, you need a systematic but flexible system that can take into account the difficulty of the material, the author’s writing style, and the goals of your assignment. SQ3R is flexible enough to take all three elements into account.

S: Survey to Get a General Overview and Make Predictions

When you begin a textbook assignment, don't just open your textbook and start reading. Instead, survey or preview the material using the general

†PQRST is one popular alternative: Preview, Question, Read, Self-Recitation, Test.
†Brown is the author of The Da Vinci Code.
†Meyer is the author of The Southern Vampire Series.
sequence of steps described in the following box. Although the steps in a survey may increase or decrease according to text difficulty and your knowledge of the material, these seven steps are almost always essential. Take ten or twenty minutes to complete them before officially starting to read, and you will be well-rewarded in terms of both comprehension and remembering.

1. Read the title. Consider what it suggests about the chapter’s content.
2. Read all introductory material. That includes chapter outlines, lists of questions, goals, and objectives, all of which identify what the author expects readers to learn.
3. Use the title and introduction to form a general question or two about what’s covered in the chapter. Check your memory to see if you have any prior knowledge, or previous experience, with the topic discussed.
4. Read the headings and opening sentence of chapter sections. If the material is especially difficult or unfamiliar, expand this step: Read the last sentence of every chapter section or even the first and last sentence of every paragraph.
5. Look at all visual aids. Visual aids include pictures, photos, maps, charts, boxes, icons, and graphs. If captions, or explanations, accompany the visual aids, read them, too. Ask yourself what each visual aid suggests about the chapter’s content. If specific icons are used consistently in the chapter, see if you can figure out what kinds of information they identify.
6. Pay attention to words printed in boldface or in the margin of the page. With particularly important or difficult courses, expand this step to include jotting boldface or italicized terms in the margins. As you read, you can then add definitions to the terms noted in the margins.
7. Read end-of-chapter summaries and questions. If there is no end-of-chapter summary, read the last page of the chapter.

More on developing prior knowledge using the World Wide Web on pages 40–51.
Icons: 1. visual symbols or representations, which, in textbooks, signal significance. 2. a person who is the object of much attention, as in “a pop icon.”
You’ll be surveying a selection shorter than a chapter on pages 53–60. Note how the survey steps are adapted.
The Four Goals of a Survey

Whatever the length and depth of the survey, it should always give you the following: (1) a general overview of the material, (2) a feeling for the writer's style and organization, (3) a sense for what's important, and (4) an idea of the chapter's (or article's) natural breaks or divisions. This information can help you decide the number and length of your study sessions.

While most articles assigned for outside reading can be read and at least generally understood in a single study session, chapter assignments should be divided up and read in chunks of ten to fifteen pages.

Ten Questions to Consider During Your Survey

1. What does the title suggest about the author's emphasis or focus?
2. According to the headings, what issues or topics will the author address?
3. Are any visual aids included? What do they suggest about chapter content and focus?
4. Do any chapter sections look especially difficult?
5. Does any of the material look familiar?
6. Does the author consistently use **boldface**, marginal annotations, color, icons, or **italics** to emphasize important words and ideas?
7. How many pages should I plan to complete during each study session?
8. Do I have any background knowledge about the topics or issues addressed in this chapter?
9. Do the headings include any questions I can use to focus my attention while reading?
10. Is there a summary I can use to figure out what's central to the chapter?

The Importance of Reading Flexibility

Before moving on to the next step in SQ3R, it's time to talk about the importance of **reading flexibility**, or the willingness to change reading strategies in accordance with the material. If, for example, flexible readers are studying a textbook chapter on marriage and the family and don't feel that the material is especially difficult, they might do an abbreviated
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survey: They would read just the introduction and the headings while ignoring the pictures and other visual aids.

But if those same readers were studying a biology chapter that was difficult, they would make their survey longer and more detailed. They would look at every clue to meaning in the chapter. They might even read the first sentence of every paragraph.

Flexible readers feel the same way about taking notes or reviewing. Difficult texts get a separate sheet of detailed notes and numerous reviews. Less difficult texts might be just as well-served by marginal notes and underlining, followed by one or two reviews.

**EXERCISE 1  Surve ying for Advance Knowledge**

**DIRECTIONS**

Survey this selection by reading the headings and the first and last sentence of each paragraph, along with all visual aids. Based on the information drawn from your survey, answer the questions that follow.

**READING TIP**

Be a flexible reader who consciously adapts your reading strategies to the text in front of you. If, for instance, reading your history text at the same pace you were reading your health text leaves you feeling confused, be ready to adapt to the more difficult material by slowing down your reading rate.

**SUMMING UP THE KEY POINTS**

1. Surveying a chapter before you read it should fulfill four objectives: Your survey should (1) give you a general overview of the chapter, (2) give you a feel for the writer’s style and method of organization, (3) help you figure out what’s important in the chapter, and (4) identify chapter breaks that will help you decide how many pages you want to read in each study session.

2. Flexibility is crucial to surveying and every other aspect of reading. Each new reading assignment calls for a different set of reading strategies that reflect the kind of material you are reading, the author’s style, and your own purpose in reading.

**EXERCISE 1  Surveying for Advance Knowledge**
Gender Identity: Our Sense of Maleness or Femaleness

1 By the age of three, most children have acquired a firm sense of their gender identity, of being either male or female. But what determines gender identity? The answer is not yet clear. Some research points to biological influences. Perhaps prenatal influences, such as fetal* sex hormones, sculpt the brain in ways that determine the later development of gender identity (Collaer & Hines, 1995). But research suggests that gender identity may not be fully stamped in at birth. In this research, children who were born with ambiguous* genitalia because of congenital* birth defects developed a gender identity that was consistent with the gender to which they were assigned and raised accordingly, even when the assigned gender conflicted with their chromosomal (XY or XX) sex (Slijper et al., 1998). All in all, most scientists believe that gender identity arises from a complex interaction of nature (biology) and nurture (rearing influences) (Diamond, 1996).

2 Whatever the determinants* of gender identity may be, it is almost always consistent with one’s chromosomal* sex. But for a few individuals gender identity and chromosomal sex are mismatched. These individuals have the gender identity of one gender but the chromosomal sex and sexual organs of the other.

Transsexualism: A Mismatch of Identity and Biology

3 People with transsexualism feel trapped in the body of the opposite gender by a mistake of nature. A transsexual man is anatomically a man but has the gender identity of a woman. A transsexual woman is anatomically a woman but possesses a male gender identity. Myths around transsexualism abound. Table 1.1 on page 7 exposes some of the more common myths.

4 Transsexual men and women may be repulsed* by the sight of their own genitals. Many undergo gender reassignment surgery to surgically

*Fetal: related to unborn offspring still in the womb.
*Ambiguous: uncertain, open to interpretation.
*Congenital: present at birth.
*Determinants: causes.
*Chromosomal: related to chromosomes, the microscopically visible carriers of genetic inheritance.
*Repulsed: disgusted.
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Table 1.1 Myths vs. Facts About Transsexualism

<table>
<thead>
<tr>
<th>Myth</th>
<th>Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many transsexual men and women do not have gender reassignment surgery because they want to avoid postsurgical pain and complications or because the costs are prohibitive.</td>
<td>Some are. But others cross-dress to become sexually aroused, not because they are transsexual. Also, some gay males known as “drag queens” dress in women’s clothing but are not transsexual.</td>
</tr>
<tr>
<td>Men who wear women’s clothes are transsexual.</td>
<td>Transsexualism should not be confused with homosexuality. People with a gay male or lesbian sexual orientation have an erotic attraction to, and preferences for, partners of the same gender. Yet their gender identity is consistent with their anatomic sex. A gay male, for instance, perceives himself to be a man who is sexually attracted to other men, not as a woman trapped in a man’s body. Gay males or lesbians would no more want to rid themselves of their own genitals than would a heterosexual man or woman.</td>
</tr>
</tbody>
</table>

Gender Reassignment

Police officer Tom Ashton (left) underwent gender reassignment surgery and hormonal replacement, becoming Claire Ashton (right).
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Concept 1.4 Each society defines masculinity and femininity by imposing a set of gender-based expectations about behavior and personality. and the ovaries in the woman—reproduction is impossible. Thus, surgery does not change a man into a woman or a woman into a man, if what it means to be a man or a woman depends on having the internal reproductive organs of their respective sex. Nonetheless, gender reassignment surgery generally permits the individual to perform sexual intercourse. Hormonal replacement therapy is used to foster growth of the beard and body hair in female-to-male cases and of the breasts in male-to-female cases.

The underlying causes of transsexualism remain a topic of debate and scientific inquiry. Some scientists believe that a combination of sex hormones, genes, and environmental factors that influence the fetus during prenatal development may alter the architecture of the developing brain (Zhou et al., 1995). The result may be a mismatch of mind and body in which the brain becomes sexually differentiated in one direction during prenatal development even as the genitals become sculpted in the other.

Gender Roles and Stereotypes: How Society Defines Masculinity and Femininity

6 The cultural expectations imposed on men and women to behave in ways deemed appropriate for their gender are called gender roles. Fixed, conventional views of “masculine” and “feminine” behavior are called gender-role stereotypes. In our culture, the stereotypical female is perceived as nurturing, gentle, dependent, warm, emotional, kind, helpful, patient, and submissive. The stereotypical male, personified* by the ruggedly masculine characters in countless movies, is tough, self-reliant, and independent but also dominant and protective.

7 Yet gender roles have changed and are changing still. Most women today work outside the home, and many are pursuing careers in traditionally male domains like law, medicine, and engineering. Some command naval vessels or pilot military helicopters. And in the legal profession, women now constitute 29 percent of lawyers as compared to only 15 percent in 1983 (“A Growing Gender Gap,” 2000). Nevertheless, many traditional gender roles remain much as they were several generations ago. Women currently constitute 93 percent of registered

*prenatal: before birth.
*personified: offering the perfect illustration.
nurses (only a slight decrease from 96 percent in 1983) and 84 percent of flight attendants (an increase from 74 percent in 1983). Household and child-care responsibilities still fall more heavily on women, even on those who work in full-time jobs outside the home. (Nevid, *Psychology: Concepts and Applications*, pp. 332–34.)

1. The term *gender identity* refers to

2. Gender identity is a result of
   a. our genetic inheritance.
   b. our relationships to peers.
   c. our genetic inheritance and our social training.
   d. the genes we inherit and our training in elementary school.

3. Transsexuals feel they are

4. The term *gender roles* refers to

5. The author believes
   a. gender roles are changing.
   b. gender roles have not changed.
   c. gender roles should not change any more than they have.
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Q: Ask and Answer Questions While Reading

Many students complain that they lose concentration when they study. This isn’t unusual. It happens to all of us when we try to absorb new and difficult material for any length of time. Still, the problem of failing concentration can be considerably reduced if you ask questions while reading. Raising and answering questions during a study session can help you remain mentally active throughout your reading. Using questions to maintain your concentration can also keep you alert to key points addressed in the chapter.

Use Introductory Lists of Questions

Many textbook chapters open with a list of questions or objectives the author (or authors) wants to address. When it comes to identifying what’s essential to the chapter, such lists are extremely useful. Thus, it pays to jot some abbreviated version of them down before you begin reading. That way you can be alert to places in the text where questions get answered or objectives are fulfilled.

Q: Ask and Answer Questions While Reading

1. What are the goals of a survey?
   
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

2. What does the term *reading flexibility* mean?
   
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

*A how-to-study program must be individualized to each student’s needs.*
—Francis P. Robinson

CHECK YOUR UNDERSTANDING
Turning Headings into Questions

Most textbook chapters are divided by major and minor headings. **Major headings** introduce the topics or issues addressed within the chapter. **Minor headings** further subdivide topics and issues introduced by the major headings. The following selection, for example, opens with the major heading “Personal, Social, and Cultural Influences on Identity Formation.” Note how the minor headings further subdivide the selection.

**Major Heading**

**Personal, Social, and Cultural Influences on Identity Formation**

1. The adolescent’s progress toward identity achievement is influenced by at least four factors: cognitive* growth, parenting, schooling, and the broader social-cultural context.

**Minor Heading**

2. **Cognitive Influences** Cognitive development plays an important role in identity achievement. Adolescents who have achieved solid mastery of formal thought and who can reason logically about hypotheticals* are now better able to imagine and contemplate* future identities. Consequently, they are more likely to raise and resolve identity issues than are age-mates who are less intellectually mature (Berzonsky & Kuk, 2000; Boyes & Chandler, 1992).

**Minor Heading**

3. **Parenting Influences** The relationships that adolescents have with their parents can also affect their progress at forging an identity (Grotevant & Cooper, 1998; Markstrom-Adams, 1992). Adolescents who move easily into identity achievement appear to have a solid base of affection at home combined with considerable freedom to be individuals in their own right (Grotevant & Cooper, 1998). In family discussions, for example, these adolescents experience a sense of closeness and mutual respect while feeling free to disagree with their parents and to be individuals in their own right. So the same loving and democratic style of parenting that helps children gain a strong sense of self-esteem is also associated with healthy and adaptive* identity outcomes in adolescence.

**Minor Heading**

4. **Scholastic Influences** Does attending college help one to forge an identity? The answer is yes—and no. Attending college does seem to push people toward setting career goals and making stable occupational commitments (Waterman, 1982); but college students are often far behind

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* cognitive: related to thinking.
* hypotheticals: things existing only as theories, not yet realities.
* contemplate: consider; think about.
* adaptive: capable of responding effectively to new situations.
their working peers in terms of establishing firm political and religious identities (Munro & Adams, 1977). In fact, some collegians regress* from identity achievement. But let’s not be too critical of the college environment, for, like college students, many adults will later reopen the question of who they are if exposed to people or situations that challenge old viewpoints and offer new alternatives (Kroger, 2005).

5 **Cultural-Historical Influences** Finally, identity formation is strongly influenced by the broader social and historical context in which it occurs (Bosma & Kunnen, 2001)—a point that Erikson himself emphasized. In fact, the very idea that adolescents should choose a personal identity after carefully exploring many options may well be peculiar to industrialized societies of the twentieth century (Cote & Levine, 1988). As in past centuries, adolescents in many nonindustrialized societies today will simply adopt the adult roles they are expected to adopt, without any soul-searching or experimentation: Sons of farmers will become farmers, the children of fishermen will become (or perhaps marry) fishermen, and so on. For many of the world’s adolescents, then, what [researchers] call identity foreclosure is probably the most adaptive route to adulthood. In addition, the specific life goals that adolescents pursue are necessarily constrained somewhat by whatever options are available and valued in their society at any given point in time (Bosma & Kunnen, 2001; Katsuyama, 2000). (Adapted from Shaffer, *Social and Personality Development*, pp. 192–93.)

All the headings shown in the previous selection are a source of questions that can guide your reading. Using words like what, how, and why, you can reframe those headings, turning them into questions such as “What are cognitive influences?” “How do cognitive influences affect identity formation?” “What role does parental influence play in identity formation?”

**Form Questions Based on Key Terms**

Authors frequently use boldface, italics, boxes, or notes in the margins to highlight key vocabulary. When you spot those highlighted terms during a survey, use them as the basis for questions; for example, the following two words appear as marginal notes in a chapter on memory. Both provide the basis for questions.

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*regress: move backward.*
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Mnemonic* a device for improving memory

Acronym* a word composed of the first letter of a series of words

Questions: 1. What are some examples of mnemonics, and are they useful for all kinds of remembering?
2. What are some examples of acronyms, and how can they aid memory?

Use End-of-Chapter Summaries

Textbook authors frequently use a summary section to identify a chapter’s core concepts. It follows then that readers should use these concluding sections as the basis for questions. Here’s a brief excerpt from a summary of a chapter on early childhood development. Although the list states the key points to be learned from the chapter, the items in the list are fairly general. Questions can focus them more by asking for specific explanations or examples of what’s been said.

Chapter Summary

Early Social Relationships
1. A newborn infant has a natural tendency to actively participate in her social world.
   Question: How does the infant show this “natural tendency”?
2. Infant-caregiver synchrony refers to the closely orchestrated social and emotional interactions between an infant and his caregiver. It provides an important basis for the development of attachment relationships.
   Question: How does synchrony help form a basis for the development of attachments?

*mnemonic: memory aid; a famous and common mnemonic used for spelling is “i before e except after c.”
*acronym: word created out of the first letter of several words or syllables; NATO (North Atlantic Treaty Organization) and SCUBA (Self-Contained Underwater Breathing Apparatus) are both acronyms.
3. The effects of nonmaternal care and maternal employment on infant and toddler development depend on the specific circumstances but in general do not appear to have negative effects.

*Question:* How do the specific circumstances affect nonmaternal care and maternal employment?

4. When given the opportunity to do so, infants engage in active social interactions with their siblings and peers, and often prefer them to their parents as playmates.

*Questions:* What are the social interactions infants engage in with siblings and peers? How do the infants show a preference?

### Speaking of *Who, When, and Where*

The words *who, when, and where* can certainly be used to form questions. Just be aware that questions using these three words frequently produce brief answers that don’t have much depth or detail; for example, When did Freud publish his landmark text, *The Interpretation of Dreams*? The answer is 1900, and that’s all the information or insight you’ll get from asking that question.

Question openers such as *what, why, how,* and *in what way* can help you dig more deeply into the text. The deeper, or more detailed, your understanding of the material, the easier it will be to remember what you’ve read.

### SUMMING UP THE KEY POINTS

1. Readers who pose questions are less likely to lose their concentration while reading. They are also more likely to spot the most important passages in a chapter.

2. Questions used to guide your reading can be based on (1) introductory lists of questions and objectives, (2) major and minor headings, (3) key words highlighted in the text, and (4) summary sections of chapters.

#### EXERCISE 2 Using Questions to Focus Your Attention

**DIRECTIONS** Read the headings and the first sentence of every paragraph. Then make a list of questions you would use to guide your reading of this selection.
The Digestive System

All food which is eaten must be changed into a soluble, absorbable form within the body before it can be used by the cells. This means that certain physical and chemical changes must take place to change the insoluble complex food molecules into simpler soluble ones. These can then be transported by the blood to the cells and be absorbed through the cell membranes. The process of changing complex solid foods into simpler soluble forms which can be absorbed by the body cells is called digestion. It is accomplished by the action of various digestive juices containing enzymes.

Enzymes are chemical substances that promote chemical reactions in living things, although they themselves are unaffected by the chemical reactions.

Digestion is performed by the digestive system, which includes the alimentary canal and accessory digestive organs. The alimentary canal is also known as the digestive tract or gastrointestinal (GI) tract. The alimentary canal consists of the mouth (oral cavity), pharynx (throat), esophagus (gullet), stomach, small intestine, large intestine (colon), and the anus. It is a continuous tube some 30 feet (9 meters) in length, from the mouth to anus.

The accessory organs of digestion are the tongue, teeth, salivary glands, pancreas, liver, and gallbladder.

Layers of the Digestive System

The walls of the alimentary canal are composed of four layers: (1) the innermost lining, called the mucosa, is made of epithelial cells; (2) the submucosa consists of connective tissue with fibers, blood vessels, and nerve endings; (3) the third layer, the muscularis consists of circular muscle; and (4) the fourth, the scrosa has longitudinal muscle. The mucosa secretes slimy mucus. In some areas, it also produces digestive juices. This slimy mucus lubricates the alimentary canal, aiding in the passage of food. It also insulates the digestive tract from the effects of powerful enzymes while protecting the delicate epithelial cells from abrasive substances within the food.

Lining of the Digestive System

The abdominal cavity is lined with a serous membrane called the peritoneum. This is a two-layered membrane with the outer side lining the abdominal cavity and the inner side, or visceral, lining covering the outside of each organ in the abdominal cavity. An inflammation of the lining of this cavity caused by disease-producing organisms is called peritonitis.

There are two specialized layers of peritoneum. The peritoneum that attaches to the posterior wall of the abdominal cavity is called the mesentery. The small intestines are attached to this layer. In the anterior portion
of the abdominal cavity a double fold of peritoneum extends down from
the greater curvature of the stomach. This hangs over the abdominal
organs like a protective apron. This layer contains large amounts of fat and
is called the greater omentum. The peritoneal structure between the liver
and stomach is called the lesser omentum.

Functions of the Digestive System
The functions of the digestive system are to change food into forms that
the body can use and to eliminate the waste products. These functions are
accomplished in four major steps.

1. Break down food physically into smaller pieces
2. Change food chemically by digestive juices into the end products of fat,
carbohydrates, and protein
3. To absorb the nutrients into the blood capillaries of the small intestines
   for use in the body
4. To eliminate the waste products of digestion (Scott and Fong, Body
   Structures and Functions, pp. 376–77.)

CHECK YOUR UNDERSTANDING

1. Why is posing questions while reading beneficial?

2. What are some of the sources readers can use as the basis for questions?
R1: Read Difficult Material in Sections or Chunks

If you have an overall picture of a chapter or an article's contents and you know some of the questions you want to answer, it’s time to start reading. Remember, though, that textbook study sessions shouldn’t last more than one and a half to two hours. Your eyes could keep going a good deal longer than that, but your brain probably couldn’t, and your concentration would be less focused. It’s better to plan on a two-hour maximum study session so that you can stay focused the whole time.

Assign Yourself a Specific Number of Pages

Before you start reading, assign yourself a specific number of pages that you want to cover. The number should be determined by the length of the material and how much you already know about it. If you have no background knowledge about the subject under discussion, if the content is complex and the style difficult, consider reading only eight to ten pages per session. Just make sure you plan on at least three study sessions to get through the chapter. Think about reading a whole chapter in one sitting only if the material is familiar and the style easy to read.

Vary Your Assignments to Stay Sharp

If you wish, you can certainly take a half-hour break and then return to the chapter to finish it. But in terms of remembering what you read, you might be better off switching to a different assignment. Varying your assignments so that you aren’t spending all your time on one subject helps concentration and remembering. Your brain feels refreshed and more alert simply because it’s working on something new.

Be Prepared to Re-Read

For some odd reason, many people think that being a good reader means never having to re-read a single word. Yet, if anything, good readers have a knack for knowing when a passage requires a second or even a third reading. They also don’t see re-reading as a sign of failure. They know that understanding almost any subject requires a willingness to read and re-read until the words start making sense.

Skilled readers also know that re-reading in the same way and at the same rate usually doesn't work. If they do a second reading, they slow down their reading rate and try a different reading strategy, say drawing a diagram or reading aloud.
Write While You Read

If I could personally give every student who reads this book one piece of advice, it would be this: Keep a pen or pencil in hand while you read, and use it—a lot. With material that is somewhat familiar and written in an easy-to-absorb style, underline key words and jot brief notes in the margins of pages. With more complicated texts, especially those essential to your college career, do both—take brief marginal notes and make a more detailed set of notes in a separate notebook.

If you really want to make your way to the head of the class, then keep a highlighter close by. Use the highlighter for specific passages that seem especially significant—for example, ideas that might turn up on exams or prove useful for term papers. Because writing† while reading is critical to academic success, you’ll hear more on this subject later on in the chapter.

SQ3R and Outlining

In his book Effective Study, Robinson told his readers to pose questions while reading and write out answers as a comprehension check. Robinson also believed that outlining while reading was a great study strategy. Given Robinson’s endorsement of outlining, we can legitimately discuss it as part of SQ3R and later on talk about other writing strategies that Robinson did not explicitly mention.

Making an Informal Outline

Some students panic when they hear the word outline in the same sentence with the phrase “take notes.” They panic because they think they have to create formal outlines, where every a is followed by a b and where strict rules dictate how the outline has to be completed. But that’s not the case here. An informal outline used for note taking does not have to follow rigid rules. It just has to do the following:

1. Identify the main point or thought of each chapter section.
2. List some specifics used to explain that point or thought.
3. Indent to show relationships.
4. Leave plenty of space for the addition of more information later, during reviews.

†In this case, “writing” also includes marking, underlining, and drawing diagrams.
Here's an informal outline of the reading selection on pages 11–12.

**Informal Outline**

1. Four Things Influence Adolescent Identity Formation

   (1) Cognitive Development: When adolescents can think hypothetically, they can imagine future identity.

   (2) Parents: Identity easier to achieve on a solid family foundation.

   (3) School: May not help; some students lose identity.

   (4) Culture and History: What is and has been allowed by the culture encourages or inhibits identity.
When you outline a chapter section by section while you read, you need to answer two questions: (1) What point does the author want to make in this section? and (2) What examples, definitions, reasons, facts, and so on, does the author use to explain or prove that point?

Unless you are very familiar with the material covered, your outline at this stage of your reading may not be especially detailed. That's the reason for all the space you see in the sample outline on page 19. The space is there to be filled in with details during later reviews.

Yes, sometimes when you start an outline, you won't even be sure you understand the writer's main point. Still that's important to know. If that's the case, you need to mark the passage for a second reading. That makes outlining an excellent way to monitor, or check, your comprehension.

**Indenting Is Critical.** How you line up or indent sentences or phrases in an outline is central to identifying relationships. If sentences, phrases, or words are aligned, they are equal in importance. If one sentence is indented under another, however, then the indented item is not equal in importance. Rather, it serves to explain the previous statement.

In the sample outline, these two thoughts are equally important:

1. Cognitive Development: When adolescents can think hypothetically, they can imagine future identity.
2. Parents: Identity easier to achieve on a solid family foundation.

The following two thoughts are not. On the contrary, indention indicates that one develops the other.

1. Four Things Influence Adolescent Identity Formation
   1. Cognitive Development: When adolescents can think hypothetically, they can imagine future identity.

Outlining chapter sections is certainly not appropriate for every reading assignment. However, for assignments that are detailed, dense with facts and figures, and short on concreteness, or words that can be easily visualized—for example, *rocks, houses,* and *mountains*—consider making an outline.
To be sure, you don’t have to outline every chapter section. But do consider informal outlining for those parts of a chapter that seem difficult to process. Sorting the material to determine what goes into your outline and how the different pieces of information should be indented or aligned will help you understand the author’s thinking.

**SUMMING UP THE KEY POINTS**

1. Reading at stretches of more than two hours can be self-defeating. Your eyes may still be moving across the page at the end of two hours, but more than likely your brain is not absorbing the meaning behind the words. Plan your study sessions accordingly.

2. Varying assignments so that you don’t spend more than two hours learning material from one subject before switching to another is a good way to maintain concentration and promote remembering.

3. Writing while reading can help you really understand what you read. It’s also an excellent way to encourage remembering.

4. Informal outlines do not follow a rigid format. The key goals of an informal outline are to (1) list the key points of a chapter section and (2) indicate their relationship to one another.

5. In an outline, indenting is how you show relationships between ideas. When items in an outline are equal in importance, they are aligned. When one statement explains another, it has to be indented under the statement it explains.

**EXERCISE 3  Making an Informal Outline**

**DIRECTIONS**  Read and outline the selection that follows.

**How to Read a Newspaper**

1. Newspapers don’t simply report the news; they report somebody’s idea of what is news, written in language intended to persuade as well as inform. To read a newspaper intelligently, look for three things: what is covered, who are the sources, and how language is used.

**Coverage**

2. Every newspaper will cover a big story, such as a flood, fire, or presidential trip, but newspapers can pick and choose among lesser stories. One paper
will select stories about the environment, business fraud, and civil rights; another will prefer stories about crime, drug dealers, and “welfare cheats.” What do these choices tell you about the beliefs of the editors and reporters working for these two papers? What do these people want you to believe are the important issues?

**Sources**

3 For some stories, the source is obvious: “The Supreme Court decided . . . ,” “Congress voted . . . ,” or “The president said . . . .” But for others the source is anonymous, and you should respond to them with questions. When you read phrases such as “a high official said today . . .” or “White House sources revealed that . . .,” always ask yourself this question: Why does the source want me to know this? The answer usually will be this: because if I believe what he or she said, it will advance his or her interests. This can happen in one of three ways. First, the source may support a policy or [an] appointment and want to test public reaction to it. This is called floating a **trial balloon**. Second, the source may oppose a policy or appointment and hope that by leaking word of it, the idea will be killed. Third, the source may want to take credit for something good that happened or shift blame onto somebody else for something bad that happened. When you read a story that is based on anonymous sources, ask yourself these questions: Judging from the tone of the story, is this leak designed to support or kill an idea? Is it designed to take credit or shift blame? In whose interest is it to accomplish these things? By asking these questions, you often can make a pretty good guess as to the identity of the anonymous source.

4 Some stories depend on the reader’s believing a key fact, previously unknown. For example: “The world’s climate is getting hotter because of pollution,” “drug abuse is soaring,” “the death penalty will prevent murder,” “husbands are more likely to beat up on their wives on Super Bowl Sunday.” Each of these “facts” is either wrong, grossly exaggerated, or stated with excessive confidence. But each comes from an advocate organization that wants you to believe it, because if you do, you will take that organization’s solution more seriously. Be skeptical of key facts if they come from an advocacy source. Don’t be misled by the tendency of many advocacy organizations to take neutral or scholarly names like “Center for the Public Interest” or “Institute for Policy Research.” Some of these really are neutral or scholarly, but many aren’t.
Language

Everybody uses words to persuade people of something without actually making a clear argument for it. This is called using **loaded language**. For example: if you like a politician, call him “Senator Smith”; if you don’t like him, refer to him as “right-wing (or left-wing) senators such as Smith.” If you like an idea proposed by a professor, call her “respected”; if you don’t like the idea, call her “controversial.” If you favor abortion, call somebody who agrees with you “pro-choice” (“choice” is valued by most people); if you oppose abortion, call those who agree with you “pro-life” (“life,” like “choice,” is a good thing). Recognizing loaded language in a newspaper article can give you important clues to the writer’s own point of view. (Wilson and DiIulio, *American Government*, p. 304.)
**CHECK YOUR UNDERSTANDING**

1. Why should you avoid scheduling study sessions that are more than two hours long?

2. What is a good way to maintain your concentration even if you are studying for more than two hours?

3. If you want to improve both comprehension and remembering, what should you do while reading?

4. What should an informal chapter outline accomplish?

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### R2: See How Much You Can Recall Right After Reading†

When an author’s words are right before our eyes, we usually think we understand them. Yet if we look away from the page and try to recall what we’ve read, we often discover that what we remember is muddled or incomplete. That’s what makes the recall step of SQ3R so important. It’s a way of monitoring your understanding before going on to the next section of a chapter or an article.

But there’s another reason why recalling right after reading is critical: Most people are inclined to forget new information right after reading it. Fortunately, though, with the passage of time, the rate of forgetting slows down, and we forget less as time passes. That means anything we do to fix newly absorbed information into long-term memory right after reading—when the rate of forgetting is highest—

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†Robinson used the word recite, but he included under that term “mentally reviewing the answer or writing it out,” which is another way of saying “recall.”
improves our chances of remembering what we have read, even weeks or months later.

As always with SQ3R, there are different ways to complete this step. The one you choose depends on the kind of material you are reading and the depth of understanding you want to achieve. Here again, flexibility is key.

**Mental Recitation**

With material that's not too difficult or too unfamiliar, you can try mentally reciting answers to the following questions: What topic, or subject, was discussed? What point did the author make about the topic? How did the author illustrate or argue the point? The last question of the three is usually the toughest to answer. If you can think of one illustration or reason after a first reading, you are doing just fine.

**Try Writing Out the Answers**

Robinson believed that readers were inclined to fool themselves if they only recited answers to their questions. In his opinion, it was too easy to accept a vague and confused answer. Posing questions about the material and writing out the answers was, in Robinson's opinion, a better comprehension check. By writing out the answers, readers could tell immediately what they did (and didn't) know.

**Use Your Informal Outline**

If you are making an informal outline of chapter sections, use it during the recall stage of your reading. Cover up everything except the opening thought or point of the outline and see how many details you can recall. Then, without even looking at the outline, see how well you can recall from memory the bare bones of the chapter section, i.e., the central thought and specific reasons, illustrations, etc.

**Draw Rough Diagrams and Pictures**

If you remember what you see even better than what you hear, consider translating words into pictures or diagrams during the recall step of your reading. Then check your drawing against the actual text to see what you've missed.

Here, for instance, is a passage about the layers of the earth, followed by a reader-made diagram. Note that the reader identified all four of the layers described in the passage. For a first reading, that's very good.

Four different layers make up the Earth: the inner core, outer core, mantle, and crust. The rocky and brittle crust is the outermost and
thinnest layer. In contrast, the thickest part of the Earth’s mass is in the mantle, which is composed of iron (Fe), magnesium (Mg), aluminum (Al), silicon (Si), and oxygen (O) silicate compounds. Below the mantle lies the core, composed mostly of iron and so hot, it’s molten.* The inner portion of the core, however, is under such intense pressure, it remains solid.

**SUMMING UP THE KEY POINTS**

1. Trying to recall what you’ve read right after reading is important for two reasons. First, it is a way of monitoring your understanding. It tells you how well you have or have not understood what you’ve read. Recalling right after reading also slows down the rate of forgetting and increases your chances of remembering what the author of the text actually said.

2. Flexibility is important in choosing the method of recall. In addition to mentally reciting after reading, you should also consider the following: (1) writing out answers to the questions you posed to guide your reading, (2) covering up parts of an informal outline and then trying to recall what remains on the page, and (3) making rough diagrams or drawing pictures. The method you choose depends on the kind of material you are reading.

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*molten: heated to the point of becoming liquid.*
**EXERCISE 4  Recalling After Reading**

**DIRECTIONS**  Read the following excerpt. Then, from memory, fill in the boxes.

**Steps in Delegation**

1. The process of **delegation** essentially involves three steps. First, the manager assigns **responsibility**. That is, the manager defines the employee’s duty to perform a task. For example, when a manager tells someone reporting to him to prepare a sales projection,* order additional raw materials, or hire a new assistant, he is assigning responsibility.

2. Second, the manager must also grant the **authority** necessary to carry out the task. Preparing a sales projection may call for the acquisition* of sensitive sales reports, ordering raw material may require negotiations on price and delivery dates, and hiring a new assistant may mean submitting a hiring notice to the human resource department. If these activities are not a formal part of the group member’s job, the manager must give her the authority to do them anyway.

3. Finally, the manager needs to create **accountability**. This suggests that the group member incurs* an obligation to carry out the job. If the sales report is never prepared, if the raw materials are not ordered, or if the assistant is never hired, the group member is accountable to her boss for failing to perform the task. Indeed, if the manager is not careful, it is possible for some personnel to lose sight of their major task because they become focused on the wrong objectives. . . .

4. Of course, these steps are not carried out in rigid, one-two-three fashion. Indeed, in most cases they are implied by past work behavior. When the manager assigns a project to a group member, for instance, the group member probably knows without asking that he has the authority necessary to do the job and that he is accountable for seeing to it that it does, indeed, get done. (Adapted from Van Fleet and Peterson, *Contemporary Management*, pp. 252–53.)

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*projection: prediction of future sales.
*acquisition: the act of acquiring or obtaining something.
*incurs: produces, brings about, assumes.
Robinson’s suggestion to review right after reading is a good one. But it needs some modification and clarification. Perhaps because he assumed students were also outlining chapters while they read, Robinson allotted only five minutes for review. Actually, you need at least fifteen to make this step productive.

Robinson also didn’t always make it clear that the third R in his system represented only the first of several reviews. Trained as an educational psychologist, Robinson knew full well that mastery of new material occurs with repeated reviews that extend over time. He never assumed that the first review would be the reader’s last.

The Goals of the First Review

At this stage of your reading, your first goal is to understand how the individual parts of the chapter fit together. For example, in a chapter titled “The Professional Sports Business,” you would need to determine if the author was trying to give you a historical overview of how sports have become more about making money than a celebration of athletic prowess. Or perhaps the chapter focuses on the various elements that make up the business of sports, such as scouts, agents, contracts, owners, trainers, and endorsements. Once you have the larger chapter objective in mind, it becomes easier to see what each chapter section contributes.
The second goal of a first review is to confirm or revise your initial predictions about a chapter’s contents. Did it, for example, describe critical management skills as you had thought? Or did the chapter actually veer away from your predicted topic to describe how technology has altered the role of management on a day-to-day basis? Rethinking your original prediction provides an important benefit: It anchors the chapter’s actual contents firmly into your long-term memory.

**Pick a Review Method That Suits You and Your Assignment**

Robinson assumed that readers would be outlining while reading, thus he suggested that during the review stage of reading “the total outline should be looked over to get an overall, easily visualized picture.” Although for some assignments and some readers outlining is an ideal learning strategy, and they therefore have an outline available for review, that’s not always the case. Fortunately, there are other ways to complete a first review.

**Look at All the Major Headings.** Go through the chapter page by page. Look at each major heading and then look away to see how much you remember about the thoughts included under that heading. Give yourself just a few seconds to respond. If nothing comes to mind at the end of ten or fifteen seconds, mark the chapter or article section for another reading.

**Draw Diagrams.** If you remember pictures or images more readily than words, you might consider reviewing with diagrams. One popular diagram used for study purposes is called a concept map. With a concept map, you put the overall point of the chapter or article in the middle of the page and enclose it in a circle or box. Then you write down the headings of the individual chapter sections, attaching them by elongated arrows to the circled or boxed main thought, for example:

```
For all the benefits professional sports provide both fans and players, there are also some serious problems.
```

*deviance: the failure to follow established social rules.*
To make your diagram, you don’t have to call up everything in the chapter from memory. If you need to, leaf through the chapter and write down the headings. Then see how much you can recall about each one.

Here, for instance, is part of a diagram created for a chapter on disorders of the digestive system. Note how the reader has tried to fill in some of the details about the headings and left question marks under headings about which she recalled little or nothing.

**Common Disorders of the Digestive System**

<table>
<thead>
<tr>
<th>Stomatitis</th>
<th>Pyloric Stenosis</th>
<th>Gastritis</th>
<th>Enteritis</th>
<th>Peptic Ulcers</th>
<th>IBD†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammation of soft tissue in mouth</td>
<td>Stomach protrudes above diaphragm into esophagus opening</td>
<td>Chronic inflammation of stomach lining</td>
<td>?</td>
<td>Lesion in stomach lining, most bacterial caused</td>
<td>Crohn’s disease and ?</td>
</tr>
</tbody>
</table>

While being able to recall the main point introduced under each heading is wonderful, recognizing that you can’t recall much of anything is also useful. Your lack of recall tells you that the chapter section needs a second reading.

**Work with a Classmate**

Get someone in your class to review with you. Ask him or her to say the major headings aloud. Then respond by reciting what you remember about each one. Any time you draw a blank or remember very little, your partner should mark the passage for another reading.

**Reviews and Recall Cues**

The goals of reviews done right after reading and the long-term follow-up reviews you do for exam preparation are slightly different. Your first review, the last step in SQ3R, should give you a sense of the

†IBD: inflammatory bowel disease.
assignment as a whole. It should also help you determine what you do and don’t know about the material you’ve just finished reading.

However, the reviews you do as follow-up preparation for exams should consistently focus on reducing the number of words, or recall cues, you need to call up the information you have learned. Although you may well start out reviewing with notes or diagrams based on complete sentences—“Gender identity refers to our sense of being male or female”; “Positive deviance refers to risky behavior that is made to seem acceptable in a specific setting”; “Delegation involves three basic steps”—you should end up with notes that include only a few key words and phrases, for example, “gender identity,” “positive deviance,” “steps in delegation.” You can tell you are prepared for exams when just glancing at those key words and phrases triggers the explanations they represent.

**SUMMING UP THE KEY POINTS**

1. The third R in SQ3R refers to the review that takes place after a chapter is completed. However, Robinson knew that several reviews over an extended period of time were essential to mastery of new material. He never assumed that one review right after finishing a chapter would be enough.

2. The first goal of a review is to get a sense of how the parts of a chapter connect. Are they all effects of one cause, for instance, or do they describe a progression of events? Like the first step of SQ3R, the survey, use the review step to establish a sense of the chapter’s general, or overall, goal.

3. Robinson suggested readers should review by looking over their informal outlines, but other methods can be used as well. You can look at all the major headings and then look away to see how much information you recall about each heading. You can make a concept map, which usually represents the chapter’s central point along with the sub-topics or issues used to explain it. Or you can go over the chapter with a classmate who asks you what each major heading contributes to the overall point of the chapter.
Writing While Reading

Raising and answering questions while you read is one way to maintain your concentration and efficiently distribute your attention while you read. Combining writing with reading, however, will have the added bonus of helping you remember what you read long after you have put down the book or journal you are reading.

What follows are suggestions about how you can write and read at the same time. Over the course of several study sessions, try them all to see which ones you like best, and which ones are appropriate to specific kinds of texts. Underlining key words, for instance, probably works well with any kind of material from history to science. Diagramming, in contrast, is usually more effective with descriptions of physical events or processes.

Suggestions for Writing While Reading

1. As you do a first reading, underline in pencil key words in selected sentences that you think are essential to the author’s explanation.
2. When you do a second reading (or even a third one) for exam reviews, make final decisions about what’s essential and what’s not. This time, underline in pen.
3. Use boxes, circles, or stars to highlight key names, dates, and events.
4. If you have any personal knowledge about the subject matter, make personal comments in the margin.

Examples:

Between 1872 and 1878, William “Buffalo Bill” Cody alternated between his career as a scout for the U.S. Cavalry and his starring roles in a series of melodramas popular in the East. By 1882, he had founded the enterprise that brought him even greater fame and shaped the country’s view of itself, “Buffalo Bill’s Wild West.”

5. Use numbers to itemize individual parts of a definition, process, or procedure.
6. Paraphrase, or restate, the author’s ideas in your own words.
4 parts of emotions:
1. how you feel
2. how body responds
3. thoughts
4. purpose of
Number 8 is especially useful.

Examples:
- Emotions have several components: feelings, physiological responses, cognitions, and goals.

7. Use the margins to identify points of view that agree or disagree with the author’s.
8. Use the top margin to summarize the contents of the page.
9. Use two different-colored pens, one to underline, another for marginal notes.

Examples:
- Marshall Plan Provides Massive Aid

The [Marshall Plan] was a four-year program proposed by U.S. Secretary of State [George C. Marshall] on June 5, 1947. Its goal was to provide foreign assistance to seventeen western and southern European nations as part of post–World War II reconstruction. Between [1948 and 1951], over $13 billion was dispensed through the Marshall Plan.

10. Whenever you find yourself struggling to understand an author’s meaning for more than two or three sentences, mark the passage for a second and slower reading (e.g., RR, x2, ??).
11. Use arrows, labels, and abbreviations to make relationships between sentences clear.
12. Double underline, star, or otherwise highlight definitions.

Examples:
- If you boil water on a stove, you can see a steamy mist above the kettle, and then higher still the mist seems to disappear into the air. Of course, the water molecules have not been lost.
In the pan, water is in the liquid phase, and in the mist above the kettle, water exists as tiny droplets. These droplets then evaporate, and the water vapor mixes with air and becomes invisible. Air generally contains some water vapor. **Humidity is a measure of the amount of water vapor in air.** (Turk and Turk, *Physical Science*, p. 410.)

13. Put quotation marks or rectangles around statements you think are particularly significant.

14. Mark a statement or passage you think might be a test question (e.g., T.Q.).

15. Use double lines in the margins to identify any statements you think could be the jumping-off point for a paper. Try to comment on the statement in a way that suggests how the paper might be developed.

**Examples:**

Effect of 1918 Influenza

How lethal was the 1918 influenza? It was twenty-five times more deadly than ordinary influenzas. This flu killed 2.5 percent of its victims. Normally just one-tenth of 1 percent of people who get the flu die. And since a fifth of the world’s population got the flu that year, including 28 percent of Americans, the number of deaths was stunning. So many died, in fact, that the average lifespan in the United States fell by twelve years in 1918. If such a plague came today, killing a similar fraction of the U.S. population, 1.5 million Americans would die. (Adapted from Kolata, *Flu*, p. 216.)
Selectivity Is the Key

Whatever mix of notes, symbols, and underlining you come up with to make writing part of reading, remember this: Selectivity is the essence of marking a text. Your goal is not to emphasize every word on the page. Your goal is to make what’s important stand out so that you can review key portions of the text at a later time without re-reading the entire chapter.

Recognizing Your Learning Style

Some people seem to have a natural bent, or inclination, for understanding diagrams. They look at a diagram and instantly know what it represents. Others have to study diagrams very carefully to pull out the meaning, even if the diagram illustrates a passage they understood. The point is this: Most of us have different learning strengths and weaknesses. To find out what yours might be, see the site listed under “Internet Resource.”

Understanding your learning weaknesses is almost as important as knowing your strengths. If you realize, for instance, that you learn more easily from hearing information than from reading it, you might consider adding recitation to your study strategies.

INTERNET RESOURCE  To learn more about your learning style, go to www.varklearn.com/english/index.asp. This link is available at the student companion website for this text: www.cengage.com/devenglish/flemming/rfr11e.

READING TIP  Serious learners use trial and error to figure out what works for them and for the material they want to master. When one strategy doesn’t work, they try another.
EXERCISE 5  Marking a Text

DIRECTIONS  Read each marked excerpt. Circle the letter of the one that better illustrates the advice given on pages 32–34. Then, in the blanks at the end, explain why you chose one over the other.

a. How Short-Term Memory Works

1 Short-Term, or Working, Memory, the Mind’s Blackboard.  Many sensory impressions don’t just fade away into oblivion.* They are transferred into short-term memory (STM) for further processing. Short-term memory is a storage system that permits you to retain and process sensory information for a maximum of about thirty seconds. Short-term memory relies on both visual and acoustic* coding, but mostly on acoustic coding. For example, you attempt to keep a phone number in mind long enough to dial it by repeating it to yourself.

2 Most psychologists refer to short-term memory as working memory, since information held in short-term memory is actively “worked on,” or processed, by the brain (Baddeley, 2001; Braver et al., 2001). Working memory is a kind of mental workspace or blackboard for holding information long enough to process it and act on it (Stoltzfus, Hasher, & Zacks, 1996). For example, we engage working memory when we form an image of a person’s face and hold it in memory for the second or two it takes the brain to determine whether it is the face of someone we know. We also employ working memory whenever we perform arithmetical operations in our heads or engage in conversation. In a conversation, our working memory allows us to retain memory of sounds long enough to convert* them into recognizable words.

3 In the 1950s, psychologist George Miller performed a series of landmark* studies in which he sought to determine the storage capacity of short-term memory. Just how much information can most people retain in short-term memory? The answer, Professor Miller determined, was about seven items, plus or minus two (Kareev, 2000). Miller referred to the limit of seven as the “Magic 7.”

4 The magic number seven appears in many forms in human experience, including the “seven ages of man” in Shakespeare’s As You Like It, the Seven Wonders of the World, the Seven Deadly Sins, and even the seven dwarfs of...
Disney fame (Logie, 1996). Investigators find that people can normally repeat a maximum of six or seven single-syllable words they have just heard (Hulme et al., 1999). Think about the “Magic 7” in the context of your daily experiences. Telephone numbers are seven-digit numbers, which means you can probably retain a telephone number in short-term memory just long enough to dial it. (Nevid, Psychology: Concepts and Applications, p. 221.)

b. How Short-Term Memory Works

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**READING TIP**

Using a variety of page-marking techniques will keep you focused and sharp. It will also help you remember what you read.

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**The Importance of Varying Your Reading Rate**

“Readers make choices in the kinds of attention they give to texts—from scanning, skimming, and speed reading to deep reading and re-reading.”

—Catherine L. Ross, professor, University of Western Ontario

Unless you are reading a very difficult text, where the complexity of the material forces you to maintain a low, phrase-by-phrase reading rate (see the following chart), the speed with which you read should vary. While re-reading the introduction you already surveyed, for instance, you can speed up to 500 or 600 words a minute. You need to slow down, though, when you start a chapter section, reducing your rate to around 250 or 300 words a minute.

With material that is familiar and not too difficult—introductions in textbooks, for instance, are often lists of single sentences rather than paragraphs—your reading rate can be on the boundary between skimming and study reading. If you are reading a chapter on childhood nutrition, for example, and already know much of the information from another course, then keep your reading rate fairly high, between 350 and 400 words a minute. If the text becomes difficult, don’t be afraid to slow down and do an analytical, or close, reading, probably at 100 or 150 words a minute.
The Importance of Varying Your Reading Rate

Good readers are flexible about reading rate. They vary it to suit the material and their reading purpose.

<table>
<thead>
<tr>
<th>Reading Strategy</th>
<th>Purpose</th>
<th>Type of Assignment</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scanning</td>
<td>To locate a specific piece of information</td>
<td>You are searching for a specific fact, statistic, or study.</td>
<td>700 to 1,000 words a minute</td>
</tr>
<tr>
<td>Skimming</td>
<td>To get a general overview of an article or a chapter</td>
<td>You are preparing to read a chapter and previewing it to determine how much time and how many study sessions you will need to master the material.</td>
<td>400 to 800 words a minute</td>
</tr>
<tr>
<td>Study Reading</td>
<td>To understand an author’s message or follow the plot of a novel or short story</td>
<td>You are reading a detailed but clearly written chapter in preparation for class.</td>
<td>250 to 400 words a minute</td>
</tr>
<tr>
<td>Close or Analytical Reading</td>
<td>To understand a hard-to-read passage or unfamiliar and complex material</td>
<td>You are trying to understand a chapter filled with new and ideas written in a hard-to-read style.</td>
<td>100 to 250 words a minute</td>
</tr>
</tbody>
</table>

INTERNET RESOURCE To learn more about both study skills and reading rate, go to www.studygs.net. You can find this link and all the others mentioned in the text at the student companion website for this text: www.cengage.com/devenglish/flemming/rfr11e.
Mining the Web for Background Knowledge

Around 1970, reading researchers began focusing on the relationship between background knowledge and comprehension. Almost unanimously they came to one conclusion: The more readers know about a subject before they begin reading, the more their comprehension improves.

In the 1970s, though, student readers couldn’t really put this insight into practice. It would have required too much time searching for sources. Fortunately the arrival of the Internet and the World Wide Web has changed all that.

The World Wide Web Makes a Difference

Today, if you survey a textbook chapter and think, “Oh no, this reads as if it were written in a foreign language, that’s how little I know about the subject,” you can turn to the World Wide Web, a huge network of computerized documents linked together in cyberspace. The Web has information on just about any topic you can think of. With the Web, it is possible to develop background knowledge about whatever subject you are studying.

Why Bother with the Web?

Can you complete your reading assignments without turning to the Web for background knowledge? Absolutely. But if you use the Web to get a sense of what the chapter is about before you start reading, you will have a better understanding of your assignment. If, for instance, you are reading about personal finance and home ownership, you’ll find the text makes sense more quickly if you know what terms like “fixed rate mortgages” and “adjustable rate mortgages” (or ARMs) mean before you begin reading.

Google and More

To get around on the Web, you need a search engine, or software that helps you move from website to website. Currently, Google is the most
famous search engine, and it will certainly help you find the information you need. However, to get more varied results, you might consider using two search engines rather than one. For instance, in addition to Google.com, try search.yahoo.com or Microsoft’s new search engine Bing.com. Studies indicate that different search engines produce some results unique to the particular search engine. That means you might get better, more on-target results from one search engine than from another.

**Search Terms Matter**

Computers only give back what people put into them, and using a vague, general search term to guide your search engine won’t get you what you want. More precisely, you won’t get it in record speed. A carefully chosen search term, in contrast, can prepare you for your reading assignment in a matter of minutes.

**Evaluating Websites**

For an illustration, imagine that you are assigned a chapter on President Harry Truman’s Cold War policies following World War II. Let’s imagine as well that you know absolutely nothing about this topic. All you know is that the Cold War was a period during which the Russians and the Americans were always threatening one another with military annihilation. To deepen your understanding of the era and of Truman, let’s say you typed the single word “Truman” into a search engine. The kind of list you would get is shown on page 42.

With these results, most students would be likely to give up trying to get background knowledge for the assignment. Nothing on the list shown on page 42 promises an explanation of how Truman responded to the Cold War. However, the story changes dramatically if we use a phrase to make the search term narrower, or more specific. When we search with the phrase “Truman’s Cold War Policies,” the results shown on page 43 come up.

---

1Dogpile is a metasearch engine; i.e., it combines results from many different search engines. The owners of Dogpile, InfoSpace, have published two studies showing that results of different search engines do not reveal much overlap.

1Cold War: a competitive state of military tension and rivalry between nations that does not quite end up in a war. For the United States, the Cold War spanned the five decades following World War II.
Chapter 1

Strategies for Textbook Learning

Harry S. Truman - Wikipedia, the free encyclopedia
During World War I Truman served as an artillery officer. After the war he became part of the political machine of Tom Pendergast and was elected a county ... en.wikipedia.org/wiki/Harry_S._Truman - 417k - Cached - Similar pages

Truman State University
Research affiliation: Center for Research Libraries.
www.truman.edu/ - 8k - Cached - Similar pages

The H. Truman Scholarship Foundation | Home
Scholarships for college juniors who show leadership potential and have an interest in government or public sector service.
www.truman.gov/ - 19k - Cached - Similar pages

Biography of Harry S. Truman
Biography of Harry S. Truman, the thirty-third President of the United States (1945-1953).
www.whitehouse.gov/history/presidents/ht33.html?PHPSESSID=bfaf77cfd434ee5015680b531638c5a - 17k - Cached - Similar pages

Harry S. Truman Library and Museum
Jan. 21, 2009 ... Truman Presidential Library & Museum hosts documents, photographs, virtual exhibits, audio files, oral histories, digital archives, ...
www.trumanlibrary.org/ - 36k - Cached - Similar pages

Truman - Google Books Result
by David McCullough - 2003 - Biography & Autobiography
Drawing on newly discovered archival material and extensive interviews with Truman’s own family, friends, and Washington colleagues, McCullough tells the...
books.google.com/books?isbn=067189205...

Truman College
Truman College is a community college on Chicago's north side offering two-year degrees, career, ... Truman College is one of the City Colleges of Chicago.
www.trumancollege.cc/ - 46k - Cached - Similar pages

The Truman Show (1998)
Directed by Peter Weir, With Jim Carrey, Laura Linney, Noah Emmerich. An insurance salesman/adjuster discovers his entire life is actually a TV show.
www.imdb.com/title/tt0120382/ - 59k - Cached - Similar pages

American Experience | Truman
Truman: The tragic story of America’s first great songwriter.
www.pbs.org/wgbh/amex/truman - 19k - Cached - Similar pages

Amazon.com: Truman: David McCullough: Books
Truman and over 225,000 other books are available for Amazon Kindle .... This warm biography of Harry Truman is both an historical evaluation of his ...
www.amazon.com/Truman-David-McCullough/dp/067189205 - 364k - Cached - Similar pages
These would become the main bureaucracies for US policy in the Cold War. 

Cold War Policies
Feb 9, 2006 ... President Truman's Cold War policy became one of "containment" of the Soviets, which meant not challenging the Communists where they were ....

The Truman Doctrine and NSC 68

This Day in History 1948: Henry Wallace criticizes Truman's Cold War
Henry Wallace, former vice-president and current Progressive Party presidential candidate, lashes out at the Cold War policies of President Harry S. Truman ....

79.02.01: The Foreign Policies of Harry S. Truman
First Lesson: Truman Takes Over the Presidency. Day 1: Foreign Policies: Ending the War in .... How the Cold War Was Played in Foreign Affairs, Vol. 51, No. ...
The sites on the list on page 43 are very different from those on the previous one. Because we included words in our search term that described more exactly what we were looking for—information related to “Truman’s Cold War Policies” rather than just Truman—we got a list of sites that talk specifically about this topic instead of the Truman library or the Jim Carrey movie *The Truman Show*.

Even better, the list includes a page from Wikipedia, the Web-based encyclopedia. As long as the Wikipedia page is not undergoing revision† and the authors cite their sources, it’s almost always a good place to get background knowledge about a topic. Certainly the entry that appears on page 45 seems perfect for our purposes.

If Wikipedia were not part of the list that came up in response to our search term, then the second site listed on page 43 also looks promising. The site description suggests the author will explain Truman’s Cold War policies and, indeed, he does. As the web page on page 46 shows, the author gives readers a general overview of the Cold War, describes its origins, and evaluates Truman’s policies.

### Personal Websites

As good as the site on page 46 is, you’d still be better off checking out another site if this one was your first choice. Like many sites maintained by a person rather than an institution, there’s a little too much opinion, or personal point of view, mixed in with the facts.

Look, for instance, at sentences like this one: “Harry Truman was ill-prepared to assume the duties of President upon FDR’s death in April, 1945, and the blame for that must be laid at Roosevelt’s feet.” This is a perfectly legitimate opinion. Many people share it. But many others don’t. In other words, the statement reveals a personal opinion or judgment.

When you are looking for background knowledge for a textbook assignment, all you really want is an overview of what events took place and who was involved in them. You don’t want the website to spend much time evaluating either the events or the people associated with your topic. That’s fine for later when you know the material, but it’s best not to start off with a website that contains numerous personal opinions. Instead, try another website to find one with mostly factual information.

†Wikipedia’s editors note when sources are not appropriate or the entry itself is not well-written. If you find an entry suggesting the need for revision, look elsewhere for information.
Cold War
From Wikipedia, the free encyclopedia

The Cold War was the state of conflict, tension and competition that existed between the United States and the Soviet Union and their respective allies from the mid-1940s to the early 1990s. Throughout this period, rivalry between the two superpowers was expressed through military coalitions, propaganda, espionage, weapons development, industrial advances, and competitive technological development, which included the space race. Both superpowers engaged in costly defense spending, a massive conventional and nuclear arms race, and numerous proxy wars.

Although the US and the Soviet Union were allied against the Axis powers during World War II, the two states disagreed sharply both during and after the conflict on many topics, particularly over the shape of the post-war world. The war had either exhausted or eliminated the pre-war “Great Powers” leaving the US and USSR as clear economic, technological and political superpowers. In this bipolar world, countries were prompted to align themselves with one or the other of the superpower blocs (a Non-Aligned Movement would emerge later, during the 1960s).

The suppressed rivalry during the war quickly became aggravated first in Europe, then in every region in the world, as the US sought the “containment” and “rollback” of communism and forged myriad alliances to this end, particularly in Western Europe and the Middle East. Meanwhile, the Soviet Union fostered Communist revolutionary movements around the world, particularly in Eastern Europe, Latin America and Southeast Asia.

The Cold War saw periods of both heightened tension and relative calm. On the one hand, international crises such as the Berlin Blockade (1948–1949), the Korean War (1950–1953), the Berlin Crisis of 1961, the Vietnam War (1959–1975), the Soviet war in Afghanistan (1979–1989), and especially the 1962 Cuban Missile Crisis, raised fears of a Third World War. The last such crisis moment occurred during NATO exercises in November 1983, but there were also periods of reduced tension as both sides sought détente. Direct military attacks on adversaries were deterred by the potential for mutual assured destruction using deliverable nuclear weapons.

The Cold War drew to a close in the late 1980s and the early 1990s. With the coming to office of US President Ronald Reagan, the US increased diplomatic, military, and economic pressure on the Soviet Union, which was already suffering from severe economic stagnation. In the second half of the 1980s, newly appointed Soviet leader Mikhail Gorbachev introduced the perestroika and glasnost reforms. The Soviet Union collapsed in 1991, leaving the United States as the sole superpower in a unipolar world.

Contents
• 1 Origins of the term
• 2 History
  • 2.1 Background
  • 2.2 World War II and post-war (1939–47)
  • 2.3 “Containment” through the Korean War (1947–53)
    • 2.3.1 Europe
    • 2.3.2 Asia
  • 2.4 Crisis and escalation (1953–62)
  • 2.5 Confrontation through détente (1962–79)
  • 2.6 “Second Cold War” (1979–85)
I believe that it must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or by outside pressures. I believe that we must assist free peoples to work out their own destinies in their own way.

President Harry S. Truman — “The Truman Doctrine,” 1947

The Cold War: The Balance of Terror

Introduction

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The United States after World War II

Cold War Resources

General Overview: Now that the Cold War is over, it is relatively easy to view it objectively—to ask whether the United States played its cards correctly, to question whether we might have been able to lower tensions sooner and more sharply. Since the U.S. and its allies "won" the Cold War (and one can properly ask whether it is really over, or perhaps better, whether tensions at that level might indeed arise again) it is easy to say, well, of course we played it right—after all, we did win, didn’t we? A more critical view might suggest that while Americans have indeed seen the fall of the Soviet Union and much of the apparatus of Communism, the U.S. might during those tension-filled years have pushed its luck so far that the only reason we did not get into a nuclear war was plain good fortune.

The Balance of Terror. In the aftermath of attacks on New York City and Washington on September 11, 2001, Americans certainly understand the fear that comes from threats of violence. Yet during the height of the Cold War in the 1950s and 1960s, the fear of nuclear war went beyond the fear of attacks on isolated cities or installations. For a time, the possibility of total nuclear war could not be ruled out, and questions were raised not only about the level of destruction that might result from a nuclear exchange, but also about what life might be like after a nuclear war. A dark joke went like this: “I don’t know what they’ll be using in World War Three, but in World War Four, they’ll be using spears.” In fact, movies like “On the Beach,” based on the novel by Nevil Shute, raised the possibility of the extinction of all human life on Earth, and few saw that scenario as a far-fetched fantasy. The height of the terror came in October, 1962, when the Soviet Union began placing offensive nuclear weapons on the island of Cuba. There can be little doubt that the resulting “Cuban missile crisis” took the world to the brink; fortunately, cooler heads prevailed and disaster was averted. But nobody cheered when it was over—the shocking impact of what was possible had been too deep, and relief was a long time coming.

The Origins. The Cold War has no definite starting point—the struggle between Communist and non-Communist systems goes back to the Russian Revolution and even beyond. But the seeds of discord between the Soviet Union and the West were first sown in a tangible way, ironically, even as the need for winning World War II were bearing fruit. At the great wartime conferences among Churchill, Roosevelt and Stalin—with some participation by Chiang Kai-Shek and DeGaulle—the defeat of Germany (and Japan) grew closer, the tensions among those leaders became sharper. More than once, for example, Roosevelt became virtually a referee in the midst of the squabbles between Churchill and Stalin. From Casablanca to Tehran, Cairo and Yalta, the leaders tried to stake a claim for what they perceived as their national interests—and world interests—in the postwar era.

President Truman’s Containment Policy. Harry Truman was ill-prepared to assume the duties of President upon FDR’s death in April, 1945, and the blame for that must be laid at Roosevelt’s feet. He did next to nothing to inform his hand-picked Vice President about the essential of his war policies, not even the atomic bomb research. Truman assumed the office while about 13 million Americans were still fighting in Europe and Asia and postwar problems were already beginning to emerge. President Truman’s Cold War policy became one of “containment” of the Soviets, which meant not challenging the Communists where they were already established, but doing everything possible to see to it that their sphere did not enlarge itself at the expense of “free” nations.

See Harry S. Truman, Containment Speech, 1947. See also David McCullough’s “Truman” and the fine HBO film of the same name with Gary Sinise. Truman wrote his own Memoirs as well.
A Note on Blogs

It’s for precisely the reason mentioned in the previous section that blogs might not be the best place to start searching for background knowledge. Blogs,† by definition, represent a personal point of view that may or may not fit the general scholarly consensus, or informed group agreement, on a topic. When you are looking for background knowledge to supplement your reading, you need a general overview. The idiosyncratic, or individual, point of view found in blogs should come later when you are trying to develop a more complex and in-depth understanding of the subject.

†Blog is the acronym for Web log, a Web page that, originally at least, was designed as a publicly accessible personal journal.

Pointers on Choosing a Website for Background Knowledge

1. **Read the website descriptions carefully, looking for references to words in your search term or people and events relevant to your chapter topics.** Search engines introduce each link with a title, description, and Web address. The most relevant links will include at least one or two words from your original search term. The least relevant ones either will not contain any words from your search term or will describe people and places that have little to do with the topic you’re interested in.

2. **If Wikipedia’s Web description seems relevant to your topic, hit that link first.** If Wikipedia cites sources and the entry is not currently being revised, then it’s an excellent site for a general overview and you probably don’t need to look any further. Of course, if you’d like to deepen your understanding by reading at least two sources, that’s always a good idea.

3. **Eliminate those sites referring to documents, conference proceedings, addresses, interviews, and journal articles.** These will probably be too limited in scope to fulfill your pre-reading purpose: to enlarge your general background knowledge.
4. **Hold off clicking on websites referred to as outlines.** Because outlines and timelines pare information down to its most basic elements, they are usually too abbreviated to be valuable as pre-reading preparation. Websites set up as outlines or timelines are better for reviews.

5. **Avoid sites that end in gov.** If the Uniform Resource Locator (URL), which is a fancy phrase for website address, ends in *gov*, the U.S. government is the source of the Web page. Although resources from the government are fine for researching a term paper, they tend to be long, dry, and sometimes hard to read. For the purpose of gaining background knowledge, you want websites that provide information in a lively and easy-to-read manner. Thus you would be better off with URLs ending in or including *edu* (the source is an educational institution); *org* (nonprofit organization); and *com* (commercial organization).

   *Note:* *htm* and *html* do not tell you anything about the source of the information. These letters describe how the pages were created.

6. **Don’t bother with sponsored sites.** Sponsored sites weren’t just found by the Web crawler searching the Web. Someone paid a fee to make them come up in response to a particular set of search terms. You will very likely have to pay to use them. They are also likely to be **biased**, or inclined to show favoritism. With Google, sponsored sites generally appear on the right-hand side of the screen, but they can also make their way into the list of sites compiled randomly, or without plan, by the Web crawler. If a site seems to be selling products of any kind, cross it off your list of links.

7. **Avoid sites that emphasize a personal interpretation, or understanding, of the people and events.** Once you become familiar with a subject and know the traditional thinking on the topic, it’s a good idea to read competing interpretations, such as “Harry Truman’s handling of the Cold War was masterful” versus “Truman’s manipulation of Cold War fears was a disaster” and decide what you think. But that’s not how to start building background knowledge when you’re first trying to understand a textbook topic.
SUMMING UP THE KEY POINTS

1. The more background knowledge you have about a textbook topic before you begin reading, the easier it will be for you to understand and remember the material.

2. The World Wide Web is an excellent source of background knowledge. Just make sure you use a search term specific enough to generate a list of websites related to your topic. Usually that means a phrase rather than a single word.

3. In selecting a site, make sure to choose one that does not express much personal bias. Your goal at this point is to understand what's traditionally thought or believed about the topic or topics included in your reading assignment. It's fine to learn about competing opinions or interpretations later, when you are thinking about writing term papers. Initially, though, your goal should be to understand the basic people, terms, and events related to the subject addressed in your text.

EXERCISE 6 Using the Web for Background Knowledge

DIRECTIONS Answer the questions by filling in the blanks or circling the correct response.

1. The letters edu indicate that a website is affiliated with, or connected to, __________________________.

2. During World War II, there was a resistance organization in Germany made up of teenagers who fought the Nazis until the entire group of young people was rounded up and executed. The group was called the “White Rose.” Imagine that you are looking for more information about this organization. Would the search term “White Rose” be a good one? After circling your answer, please explain it.

Yes or No. Please explain. __________________________

________________________________

________________________________
3. When a list of websites comes up in response to your search term, read the description to see if it contains ________________

4. Imagine that you were looking for background information on President Franklin Delano Roosevelt and you landed on a website where you found the following description. Would this be a good site to use for background knowledge? Please circle your answer. Then explain your reasoning.

Franklin Delano Roosevelt held office during a time of financial crisis and economic instability: the Great Depression of the 1930s. Roosevelt, however, rose to the occasion. Gathering around him some of the finest minds in the country, known as “Roosevelt’s brain trust,” the president introduced a radical economic program called the “New Deal.” At the heart of the New Deal was Roosevelt’s willingness to intervene in the free market through government funding of programs that would create jobs and, at the same time, improve the goods and services available to U.S. citizens. The Works Progress Administration (WPA) was the largest federal agency in the government’s program of economic relief. It provided close to 8 million jobs. The WPA affected almost every section of the country and was responsible for the building of much-needed bridges and roads still in use today. More than any president before or since, Roosevelt successfully used the government to enact essential social and political reforms.

Yes or No. ____________________________________________________________________
1. What role can the World Wide Web play in helping you complete your reading assignments?

2. When using a search term, why is it better to use a phrase instead of a single word?

3. Why aren't blogs the best place to look when you are trying to gain background knowledge about topics in a textbook assignment?
VOCABULARY CHECK

The following words were introduced in the chapter. Match the word with the definition. Review words, definitions, and original context, or setting, two or three times before taking the vocabulary tests. (The page numbers in parentheses indicate where the word first appeared.)

1. icons (p. 3)  
   __________
a. consider, think about

2. fetal (p. 6)  
   __________
b. transform, change

3. congenital (p. 6)  
   __________
c. heated to the point of becoming liquid

4. ambiguous (p. 6)  
   __________
d. condition of being completely forgotten

5. determinants (p. 6)  
   __________
e. capable of responding effectively to new situations

6. chromosomal (p. 6)  
   __________
f. causes

7. repulsed (p. 6)  
   __________
g. having important consequences on future studies or events; also a decisive turning point

8. prenatal (p. 8)  
   __________
h. related to chromosomes, the microscopically visible carriers of genetic inheritance

9. personified (p. 8)  
   __________
i. disgusted

10. cognitive (p. 11)  
    __________
j. offering the perfect illustration

11. hypotheticals (p. 11)  
    __________
k. related to sound

12. contemplate (p. 11)  
    __________
l. visual symbols or representations

13. adaptive (p. 11)  
    __________
m. before birth

14. regress (p. 12)  
    __________
n. things existing only as theories, not yet realities

15. mnemonic (p. 13)  
    __________
o. related to thinking

16. acronym (p. 13)  
    __________
p. produces, brings about, assumes

17. molten (p. 26)  
    __________
q. move backward

18. projection (p. 27)  
    __________
r. prediction of future sales

19. acquisition (p. 27)  
    __________
s. not following accepted social standards

20. incurs (p. 27)  
    __________
t. present at birth

21. deviance (p. 29)  
    __________
u. the act of acquiring or obtaining something

22. oblivion (p. 36)  
    __________
v. related to unborn offspring still in the womb

23. acoustic (p. 36)  
    __________
w. memory aid

24. convert (p. 36)  
    __________
x. word created out of the first letter of several words or syllables

25. landmark (p. 36)  
    __________
y. doubtful, open to interpretation
This reading, from a psychology text by Jeffrey Nevid, offers a detailed discussion of how new information gets stored in long-term memory.

**Memory storage** is the process of retaining information in memory. Some memories—your first kiss or your wedding, for example—may last a lifetime. But not all information becomes an enduring or long-term memory. As we shall see when we discuss the stages of memory, some information is retained for only a fraction of a second.

**Memory Retrieval: Accessing Stored Information** Memory retrieval is the process of accessing stored information to make it available to consciousness. Retrieving long-held information is one of the marvels of the human brain. At one moment, we can summon to mind the names of the first three presidents of the United States, and at the next moment, recall our Uncle Roger's birthday. But memory retrieval is far from perfect (“Now, when is Uncle Roger's birthday anyway?”). Though some memories seem to be retrieved effortlessly, others depend on the availability of **retrieval cues**, cues associated with the original learning, to jog them into awareness.
Police detectives often take victims back to the scene of the crime to help jog their memories of the crime. You may perform better on an examination you take in the classroom where you originally learned the material. The question is, why? The most widely held explanation invokes the encoding specificity principle (Tulving, 1983). According to this principle, retrieval of particular memories will be more successful when cues available during recall are similar to those that were present when the information was originally encoded. The tendency for information to be better recalled in the context in which it was originally learned is called a context-dependent memory effect. Researchers believe that stimuli present in settings in which material is originally learned may be encoded along with the material itself. These stimuli may then serve as retrieval cues that help people access the learned material (Tulving & Thompson, 1973).

Consider a classic experiment that literally went underwater to demonstrate a context-dependent memory effect. Duncan Godden and Alan Baddeley (1975) had members of two university swim clubs learn a list of words. Members of one club learned the words on the beach; those in the other club learned them while submerged in water. The “beach group” showed better recall when they were tested on the beach than when immersed in water. The other group also showed a context-dependent effect; their retention was better when they were again submerged in water.

Bodily or psychological states may also serve as retrieval cues. A state-dependent memory effect occurs when people have better recall of information when they are in the same physiological or psychological state as when they first encoded or learned the information. Schramke and Bauer (1997) manipulated subjects’ physiological states by having them either rest or exercise immediately before learning a list of twenty words. They found that recall after twenty minutes was better under the condition that prevailed in the original learning (rest or exercise). Similarly, people are generally better able to recall information when they are in the same mood (happy or sad) as when they learned the information (Bower, 1992). Bear in mind, however, that context- and state-dependent memory effects are not always observed, and when they are found, they often turn out to be rather weak (Eich, 1989).

Memory Stages

Some memories are fleeting; others are more enduring. The three-stage model of memory proposes three distinct stages of memory that vary with
Concept 1.2  The three-stage model of memory proposes three stages of memory organized around the length of time that information is held in memory: sensory memory, short-term memory, and long-term memory.

Sensory Memory: Getting to Know What’s Out There  Sensory memory is a storage system that holds sensory information in memory for a very short time. Visual, auditory, and other sensory stimuli constantly strike your sensory receptors, forming impressions that you briefly hold in sensory memory in a kind of temporary storage device called a sensory register. This information lasts in memory for perhaps a fraction of a second to as long as three or four seconds. The sensory impression then disappears and is replaced by the next one.

Short-Term, or Working, Memory: The Mind’s Blackboard  Many sensory impressions don’t just fade away into oblivion. They are transferred into short-term memory (STM) for further processing. Short-term memory is a storage system that permits you to retain and process sensory information for a maximum of about thirty seconds. Short-term memory relies on both visual and acoustic coding, but mostly on acoustic coding. For example, you attempt to keep a phone number in mind long enough to dial it by repeating it to yourself.

Most psychologists refer to short-term memory as working memory, since information held in short-term memory is actively “worked on,” or processed, by the brain (Baddeley, 2001; Braver et al., 2001). Working memory is a kind of mental workspace or blackboard for holding information long enough to process it and act on it (Stoltzfus, Hasher, & Zacks, 1996). For example, we engage working memory when we form an image of a person’s face and hold it in memory for the second or two it takes the brain to determine whether it is the face of someone we know. We also employ working memory whenever we perform arithmetical operations in our heads or engage in conversation. In a conversation, our working memory allows us to retain memory of sounds long enough to convert them into recognizable words.

In the 1950s, psychologist George Miller performed a series of landmark studies in which he sought to determine the storage capacity of short-term memory. Just how much information can most people retain in short-term memory? The answer, Professor Miller determined, was about seven items, plus or minus two (Kareev, 2000). Miller referred to the limit of seven as the “Magic 7.”

The magic number seven appears in many forms in human experience, including the “seven ages of man” in Shakespeare’s As You Like It, the Seven Wonders of the World, the Seven Deadly Sins, and even the seven dwarfs of Disney fame (Logie, 1996). Investigators find that people can normally repeat a maximum of six or seven single-syllable words they have just heard (Hulme et al., 1999). Think about the “Magic 7” in the context of your daily life.
experiences. Telephone numbers are seven-digit numbers, which means you can probably retain a telephone number in short-term memory just long enough to dial it. Before proceeding further, you can test your short-term memory by taking the challenge posed in the Try This Out feature below.

If you answered the challenge in the Try This Out feature, you probably found it easier to remember the numbers in Row 7 than those in Rows 5 and 6. Why? The answer is chunking, the process of breaking a large amount of information into smaller chunks to make it easier to recall. The sixteen-digit number in Row 7 consists of four chunks of consecutive years (1992, 1993, 1994, 1995). Instead of remembering sixteen separate bits of information, we need only remember four, which falls within the short-term memory capacity of most people. Similarly, children learn the alphabet by chunking series of letters. That’s why they often say the letters *lmnop* as if they were one word (Rupp, 1998).

**Try This Out**

**Breaking Through the “Magic 7” Barrier**

At right are seven rows containing series of numbers. Read aloud the series in the first row. Then look away and repeat the numbers out loud in the order in which they appeared. Check whether your answer was correct or incorrect, and record it in the appropriate “yes” or “no” column. Repeat this procedure for each of the remaining rows.

How well did you do? Chances are you had little trouble with the first four series consisting of four to seven numbers. But you probably stumbled as you bumped up against the “Magic 7” barrier in the next two series, which have eight and ten digits. You may have had more success with the last series, which consists of sixteen digits. But why should you perform better with sixteen digits than with eight or ten? The text above offers an explanation.

<table>
<thead>
<tr>
<th>Row</th>
<th>Numbers</th>
<th>Get It Right?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6293</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>73932</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>835405</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>3820961</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>18294624</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>9284619384</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>1992199319941995</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**maintenance rehearsal** The process of extending retention of information held in short-term memory by consciously repeating the information.
difficult to keep a particular thought in mind and at the same time follow what someone is saying in conversation.

Memory theorists have developed a number of models to explain how working memory functions. The leading model, called the three-component model, was formulated by Alan Baddeley and Graham Hitch (1974; Baddeley, 1996). They proposed that working memory consists of three components (sometimes called subsystems): the phonological loop, the visuospatial sketchpad, and the central executive (see Figure 1.1).

1. The **phonological loop** is the speech-based, or verbal, part of working memory. It is a storage device that holds numbers and words we mull over in our minds at any given moment, such as telephone numbers, people’s names, or plans for dinner. The phonological loop is engaged when you rehearse auditory material, such as by silently repeating a phone number to keep it from fading out of memory (Logie, 1996; Willingham, 2001).

2. The **visuospatial sketchpad** is a kind of drawing pad in the brain (Logie, 1996). You engage your visuospatial sketchpad whenever you picture in your mind an object, pattern, or image—the face of your beloved, the map of your home state, or the arrangement of the furniture in your living room.

3. The **central executive** is the control unit of working memory. It doesn’t store information. Rather, it receives input from the other two components and coordinates the working memory system (Baddeley, 1996; Engle, 1996). It also receives and processes information from long-term memory.

**Figure 1.1  Three-Component Model of Working Memory**

According to the three-component model, working memory consists of three subsystems: (1) a phonological loop for storing speech-based, or verbal, material; (2) a visuospatial sketchpad for storing visual and spatial material; and (3) a central executive that coordinates the other two subsystems, receiving and processing information retrieved from long-term memory, and filtering out distracting thoughts.
memory and filters out distracting thoughts so we can focus our attention on information we hold in mind at any given moment. The other components—the phonological loop and the visuospatial sketchpad—are called “slaves” because they do the bidding of the central executive (Willingham, 2001).

Since the two “slaves” work independently, they can operate at the same time without interfering with one another. When you drive an automobile, visual images of the road are temporarily stored in the visuospatial sketchpad. At the same time, your phonological loop allows you to carry on a conversation with a passenger or sing along with a song on the radio. Conflicts can arise when two or more simultaneous demands are placed on either component. It is difficult, as well as dangerous, to drive and read a roadmap at the same time. It is also difficult to hold two conversations at the same time or to listen to the TV news while attending to what someone else is saying.

Long-Term Memory: Preserving the Past  Long-term memory (LTM) is a storage system that allows you to retain information for periods of time beyond the capacity of short-term memory. Though some information may remain in long-term memory for only days or weeks, other information may remain for a lifetime. Whereas the storage capacity of short-term memory is limited, long-term memory is virtually limitless in what it can hold. We may never reach a point at which we can’t squeeze yet one more experience or fact into long-term memory.

Consolidation is the process by which the brain converts unstable, short-term memories into lasting, stable memories. The first twenty-four hours after information is acquired is critical for consolidation to occur. The dreams that occur during REM† sleep may play an important role in consolidating daily experiences into long-term memories (C. Smith, 1995). This means that if you are studying for a test you have the next day and want to increase your chances of retaining the information you’ve just learned, make sure you get a good night’s sleep.

Although short-term memory relies largely on acoustic coding, long-term memory depends more on semantic coding, or coding by meaning. One way of transferring information from short-term to long-term memory is maintenance rehearsal, which, as we’ve noted, is the repeated rehearsal of words or sounds. But a better way is elaborative rehearsal, a method of rehearsal in which you focus on the meaning of the material. A friend of mine has a

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†REM: Rapid Eye Movement sleep, a very deep stage of sleep during which time the brain is extremely active.
telephone number that ends with the digits 1991, a year I remember well because it was the year my son Michael was born. I have no trouble remembering my friend’s number because I associate it with something meaningful (my son’s birth year). But I need to look up other friends’ numbers that end in digits that have no personal significance for me.

How do we manage to organize our long-term memory banks so we can retrieve what we want to know when we want to know it? Imagine being in a museum where bones, artifacts, and other holdings were strewn about without any organization. It would be difficult, perhaps impossible, to find the exhibit you were looking for. Now imagine how difficult it would be to retrieve specific memories if they were all scattered about in long-term memory without any rhyme or reason. Fortunately, long-term memory is organized in ways that provide relatively quick access to specific memories.

A leading conceptual model of how long-term memory is organized is called the **semantic network model** (A. M. Collins & Quillian, 1969; A. M. Collins & Loftus, 1975). This model proposes that information is held in networks of interlinking concepts. We understand the meaning of something by linking it to related things. For example, the concept of “animal” might be linked to concepts of “fish” and “bird,” which in turn might be linked to associated concepts, such as “salmon” and “robin,” respectively. The act of thinking of a particular concept causes a ripple effect throughout the semantic network. This rippling effect, called **spreading activation**, triggers recall of related concepts. In other words, you think of “fish” and suddenly related concepts begin springing to mind, such as “salmon” or “cod,” which in turn trigger other associations such as “is pink,” “tastes fishy,” and so on.

Now think where else you may have encountered this notion of jumping between interlinking concepts. It is the basic principle underlying the hyperlinked structure of the World Wide Web. The inventor of the World Wide Web, English physicist Tim Berners-Lee, modeled it on how the human brain creates meaning (Berners-Lee, 1999). Berners-Lee said, “I like the idea that a piece of information is really defined only by what it’s related to, and how it’s related. . . . There really is little else to meaning. The structure is everything” (cited in Hafner, 1999, p. 20). Thus, when you go surfing in cyberspace by clicking on one link after another, you are modeling what your brain does naturally when it creates meaning by linking related concepts to each other.

We began our discussion of how memory works by recognizing that memory depends on underlying processes (encoding, storage, retrieval) that proceed through a series of stages (sensory memory, short-term memory, long-term memory). Figure 1.2 shows the three stages in schematic form.
Through these steps, we come to form long-term memories that we can recall at will or with some help (retrieval cues). Next we focus on the contents of long-term memory—the kinds of memories that enrich our lives. (Adapted from Nevid, *Psychology: Concepts and Applications*, pp. 219–25.)

**Questions Based on Your Survey**

**DIRECTIONS** Answer the questions by circling the letter of the correct response or the answer itself.

1. *True* or *False*. Memory retrieval is the process of accessing stored information that has been stored in long-term memory.

2. *True* or *False*. Sensory memory stores new impressions for a lifetime.

3. *True* or *False*. Working memory is another way of referring to short-term memory.

4. Context-dependent memory effect refers to
   a. the way in which we remember new information depending on the mood we are in at the time: If we are in a good mood, we remember it; in a bad mood, we don’t remember as much.
   b. how new information is stored depending on how much we already knew about it previously.
   c. how we are likely to recall information more easily if we are in a situation similar to the one in which the information was originally learned.
5. Based on what you have read so far, it makes sense to predict that human memory can hold at one time how many chunks of information?
   a. five
   b. seven
   c. ten
   d. twelve

6. True or False. Information that enters short-term memory always fades away after only a few seconds.

7. Maintenance rehearsal refers to
   a. memorizing long lists of unrelated words.
   b. learning how to recite aloud from memory.
   c. repeating new information in order to remember it.
   d. connecting new information to what's been previously learned.

8. True or False. Consolidation refers to our ability to ignore information not related to our current task.

9. True or False. Remembering proceeds through a series of three stages; it does not usually happen in one single step or moment.

10. True or False. In working memory, the central executive is the control unit.

Questions Based on Your Reading

DIRECTIONS Answer the questions by filling in the blanks or circling the letter of the correct response.

1. Overall, this selection describes
   a. the causes of forgetting.
   b. how memories are stored.
   c. the role of language in remembering.
   d. the changes in memory produced by aging.
2. Which of the following descriptions illustrates context-dependent memory?
   a. Even after his friend Marlene had showed him how to do it, David couldn’t remember how to increase the size of the text on his phone screen. But when he went into the kitchen, where Marlene had first showed him how to make the text bigger, he suddenly remembered that all he had to do was tap the screen twice.
   b. Ellen couldn’t seem to remember that John Adams had been the second president of the United States and Thomas Jefferson the third. So she imagined the two men drinking tea together and wearing football jerseys. Adams had a 2 on his jersey and Jefferson a 3. When she wanted to remember the order of the two presidents, she called up that image.

3. The fact that bodily states can serve as retrieval clues that aid remembering is called
   a. sensory memory state.
   b. state-dependent memory effect.
   c. short-term memory principle.

4. Sensory memory holds onto information
   a. for a very long time.
   b. for a very short time.
   c. for a lifetime.

5. The author refers to short-term memory as the mind’s

6. What did George Miller discover through his experiments?

7. What is “chunking” and how can it affect a person’s ability to remember a large amount of information?
8. True or False. The central executive is the storehouse of working memory.

9. According to the “Three-Component Model” of working memory, if you repeat an address to yourself in order to remember it, what part of working memory are you using?

10. According to the reading, the hyperlinked structure of the World Wide Web was modeled on ____________________.

Making Connections Based on what you know about SQ3R, do you think Francis Robinson knew that rehearsing new information was essential to remembering it? Yes or No. Please explain.

Drawing Your Own Conclusions Based on the information in the reading, which piece of advice for learning from textbooks would be more useful?

a. To remember the information in a textbook passage, identify the key sentences and repeat them at least three times before going on to the next chapter section.

b. To remember the information in a textbook passage, identify the key sentences and paraphrase them by substituting your words for the author’s.

Please explain what in the reading led you to select this answer.

TEST 1  Vocabulary Review

DIRECTIONS  Fill in the blanks with one of the words listed below.

cognitive  hypothetically  determinants  adaptive  personified  repulsed  prenatal  chromosomes  icons  contemplating

1. The skydiver’s close call had frightened her more than she realized. Just _______________ the idea of another jump gave her an anxiety attack.

2. Roaches have been around for millions of years because they are very _______________ creatures; no matter what situation they find themselves in, they can find something to eat, from plaster to paint to sugar cubes, glue, and other roaches.

3. At first, it seemed as if the man was describing being kidnapped by aliens, but when reporters skeptically questioned his story, the man claimed he had been speaking _______________.

4. The great baseball player Roberto Clemente, who died tragically young in an air crash, _______________ everything an athlete and role model should be.

5. She had never taken care of her own health, but once she found out that she was pregnant, she made sure she got the best of _______________ care for both herself and her baby.

6. A high-fat diet and lack of exercise seem to be two _______________ in the onset of diabetes.

7. The mathematician had first-rate _______________ skills, but emotionally he could barely function.
8. His wife tried not to show it, but she was ________________ by the changes the disease had produced in his face.

9. The ________________ on the screen were meant to resemble the functions they stood for; the one representing the print function, for instance, looked like a tiny printer.

10. At one time, people believed criminality was carried in the ________________. 
TEST 2    Vocabulary Review

**DIRECTIONS**  For each italicized word, write a definition in the blank.

1. The metal was heated until it was *molten* and could be poured into the molds, which were shaped like birds.

   *Molten* means _________________________________.

2. As soon as he started to play, the guitarist realized the hall had serious *acoustic* problems and every chord produced an unpleasant echo.

   *Acoustic* means _________________________________.

3. The 1966 case *Miranda v. Arizona* produced a *landmark* decision that profoundly affected those who had been accused of a crime: According to the *Miranda* decision, every person suspected of a crime had to be notified of the right to a lawyer.

   *Landmark* means _________________________________.

4. The *acquisition* of several new companies by Cisco Systems is proof that the company is in good financial shape.

   *Acquisition* means _________________________________.

5. Even after they have served their time, criminals jailed for sexual *deviance* are not welcomed back into society.

   *Deviance* means _________________________________.

6. Having *incurred* a huge amount of debt, the banks found themselves in deep financial trouble.

   *Incurred* means _________________________________.

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7. After mentally converting euros to dollars, she realized how expensive the book really was.

Converting means ________________________________.

8. Chimpanzees do not make good pets; at a moment’s notice, they can regress to being wild animals rather than household pets.

Regress means ________________________________.

9. The manager’s sales projections for the next five years suggested that even more employees might be laid off.

Projections means ________________________________.

10. After years of being mobbed when he appeared in public, the wrestler descended into oblivion as newer and younger performers caught the public’s fancy.

Oblivion means ________________________________.