

# Improving Memory and Reading

## Learning Objectives

Read to answer these key questions:

- How does the memory work?
- Why do we forget?
- How can I remember what I study?
- What are some memory tricks?
- How can I apply memory techniques to reading?
- What is a reading system for college texts?
- What are some ways to improve reading speed and comprehension?
- Why is positive thinking a key to remembering and reading?

**L**earning how to improve your memory and remember what you read will be a great asset in college, on the job, and in life in general. This chapter describes how memory works and provides some practical techniques for improving your memory. Once you understand how memory works, you can apply these techniques to remembering what you read. Positive thinking will help you be successful in remembering and reading effectively.

## Improving Your Memory

### How Does the Memory Work?

Understanding how the memory works provides the framework for effective study techniques. There are three stages of memory: **sensory register**, **short-term memory**, and **long-term memory**. Understanding these stages of memory will help you learn how to store information in your long-term memory, which lasts a lifetime.

- **Sensory register.** The first stage of memory is called sensory register. It is the initial moment of perception. This stage of memory lasts less than a second and is used to record sensory experience (what you see, hear, taste, touch, or do). It is like a quickly fading snapshot of what your senses perceive. The purpose of the sensory register is to allow the brain to process information and to focus on relevant information. To remember information for more than a second, it must be transferred to short-term memory.
- **Short-term memory (STM).** Paying attention to the information you have perceived in the sensory register transfers the information to STM. STM is temporary and limited, lasting only about half a minute. The information must be rehearsed or renewed for longer storage. STM records what we see, hear, feel, taste, or touch. Information is best stored in STM through recitation or mentally talking to ourselves. If the information is not repeated, it is very quickly lost. For example, when you meet a person for the first time, the person's name is often quickly forgotten because it is only stored in short-term memory. The purpose of STM is to ponder the significance of the stimuli we have received, detect patterns, and decide if the information is important enough to remember.

Grouping together or chunking bits of information can increase the limited capacity of STM. George Miller of Harvard University found that the optimum number of chunks or bits of information that we can hold in STM is five to nine.<sup>1</sup> For example, we remember telephone numbers of seven digits by using a hyphen to separate the numbers into two more easily remembered chunks. We divide our Social Security numbers into three chunks for easier recall.

According to George Miller's research, we often use the "Magical Number Seven" technique to remember material. It is much easier to remember material that is grouped in chunks of seven or less. You can find many examples of groups of seven used to enhance memory. There are seven days of the week and seven numbers in your driver's license and license plate. There are also seven dwarfs, seven deadly sins, and seven wonders of the world!

- **Long-term memory (LTM).** Long-term memory has a large capacity and is used to store information more permanently. You will want to use your LTM to store important information that you want to be able to recall at a later date. Most psychologists agree that once information is in LTM, it is there forever. Although the information is available, the problem becomes how to access it. Think of LTM as a library in which many available books are stored. If the books in the library are randomly stored, retrieval of information becomes extremely difficult. If the books are properly stored and indexed, we can find them more easily.

How are long-term memories formed? Short-term memories become long-term through repetition or meaningful association. Creating long-term memories takes some purposeful action. We are motivated to take some purposeful action to remember if the information has some survival value. When we touch a hot stove, this memory moves from sensory register to short-term memory and then is stored in long-term memory to avoid injury in the future. In an academic setting, we must convince ourselves of the survival value of what we are learning. Is the information needed to pass a test, to be successful in a career, or for personal reasons? If so, it is easier to take the action required to store information in long-term memory. Emotions such as fear, anger, or joy are also involved in the storing of memories. In the hot stove example, fear elevates the importance of the memory and helps us to store it in long-term memory. In the educational setting, an interest or joy in learning helps to store information in long-term memory.

It is interesting to note that computers are designed much like STM and LTM. The Random Access Memory (RAM) is the working and calculating part of the computer and can be compared to the STM. When the computer is turned off, the contents of RAM disappear, just as information quickly disappears in STM. The Read Only Memory (ROM) is the permanent storage component, similar to LTM.

In summary, when you are trying to store information in your memory, the first step is receiving information through the five senses to store in the sensory register, similar to entering data in a computer through the use of a keyboard. This takes less than a second. The next step involves paying attention to the sensory stimulus in order to transfer it to STM for the purpose of seeing patterns and judging significance or importance. Information only stays in STM for 30 seconds or less unless rehearsed or repeated. If you decide that the information is likely to be on a test and you need to remember it, you must organize the material in a meaningful way or repeat it to store the information in LTM. Information must be stored in LTM in order for you to remember it permanently. Effective techniques for storing information in LTM will be presented later in this chapter.

**How Does the Memory Work?**

<b>Sensory Register</b>	Initial moment of perception	Lasts less than a second
<b>STM Short Term Memory</b>	Temporary and limited	Lasts less than 30 seconds
<b>LTM Long Term Memory</b>	Permanent storage of information	Lasts forever, although you may lose access through disuse

**Figure 7.1** Short-Term Memory and Long-Term Memory.

## Why Do We Forget?

Is it true that we never forget? Material that is stored in the sensory register is forgotten in less than one second. Material stored in STM is forgotten in 30 seconds unless rehearsed or repeated. We do not forget material stored in LTM, but we can lose access to the information, similar to when a book is filed incorrectly in the library. The book is in the library, but we cannot find it.

Examining the following lists of items frequently forgotten or remembered can give us insight into why forgetting or losing access occurs.

We frequently forget these things:

- Unpleasant experiences
- Names of people, places, or things
- Numbers and dates
- What we have barely learned
- Material we do not fully understand
- What we try to remember when embarrassed, frustrated, tired, or ill
- Material we have learned by cramming
- Ideas or theories that conflict with our beliefs

We tend to remember these things:

- Pleasant experiences
- Material that is important to us
- What we have put an effort into learning
- What we have reviewed or thought about often
- Material that is interesting to us
- Muscular skills such as riding a bike
- What we had an important reason to remember
- Items we discuss with others
- Material that we understand
- Frequently used information

## Theories of Forgetting

An understanding of theories of forgetting is also helpful in developing techniques for effective study and learning. There are many theories about why we forget or lose access to information stored in LTM.

1. **I forgot.** If you forget a name, number, or fact, you might just say, “I forgot.” The information was stored in STM and never made it to LTM. Have you ever been introduced to a person and really not listened to his or her name? You didn’t forget it. You never learned it.
2. **The mental blur.** If you are studying and don’t understand the material, you will not remember it.
3. **The decay theory.** If you do not use information, you lose access to it, just as weeds grow over a path that is seldom used.

4. **Interference theory.** New memories interfere with old memories, and old memories interfere with new memories. Interference is especially likely when the memories are similar. For example, when I meet my students in the hallway, it is difficult to remember which class they are in because I have several similar classes.
5. **Reactive interference.** We tend not to remember ideas or subjects that we dislike.
6. **Reconstruction theory.** What we remember becomes distorted over time. Our personal biases affect what we remember.
7. **Motivated forgetting.** We choose to remember pleasant experiences and to forget unpleasant experiences.

## Minimizing Forgetting

Herman Ebbinghaus (1850–1909), a German psychologist and pioneer in research on forgetting, described a curve of forgetting.<sup>2</sup> He invented nonsense syllables such as WUX, CAZ, BIJ, and ZOL. He chose these nonsense syllables so that there would be no meaning, associations, or organizations that could affect the memory of the words. He would learn these lists of words and measure forgetting over time. The following is a chart of time and forgetting of nonsense syllables.

Time	Percent Forgotten
After 20 minutes	47
After 1 day	62
After 2 days	69
After 15 days	75
After 31 days	78

We can draw three interesting conclusions from examining these figures. First, most of the forgetting occurs within the first 20 minutes. Immediate review, or at least review during the first 20 minutes, would prevent most of the forgetting. Second, forgetting slows down over time. The third conclusion is that forgetting is significant after 31 days. Fortunately, we do not need to memorize nonsense syllables. We can use meaning, associations, organization, and proper review to minimize forgetting.

Review is important in transferring information from short-term to long-term memory. You can also minimize forgetting over time through the proper use of review.<sup>3</sup> Let's assume that you spend 45 minutes studying and learning something new. The optimum schedule for review would look like this:

After 10 minutes	Review for 5 minutes
After 1 day	Review for 5 minutes
After 1 week	Review for 3 minutes
After 1 month	Review for 3 minutes
After 6 months	Review for 3 minutes

By spending about 20 minutes in review time, you can remember 90 to 100 percent of the material. The short periods of review are much easier to accomplish than spending larger periods of review. Make good use of your time by having material for review immediately available. When you have three to five minutes available, review some material that you have learned previously. You will be improving access to material stored in long-term memory, and you will be able to easily recall the information for an exam or for future use in your career.

“Just as iron rusts from disuse, even so does inaction spoil the intellect.”

Leonardo da Vinci

### Memorization Tips

- Meaningful organization
- Visualization
- Recitation
- Develop an interest
- See the big picture first
- Intend to remember
- Learn small amounts frequently
- Basic background
- Relax

## QUIZ

### Improving Your Memory

Test what you have learned by circling the letters of the correct answers to the following questions.

- Information is stored permanently in the
  - sensory register.
  - short-term memory (STM).
  - long-term memory (LTM).
- You never forget.
  - False.
  - True.
  - This is true only if the information is stored properly in long-term memory.
- According to Ebbinghaus, the greatest rate of forgetting occurs
  - within the first 20 minutes.
  - within the first day.
  - within the first 15 days.
- If you do not review information stored in long-term memory, you will
  - still remember it because it is in long-term memory.
  - probably lose access to the information.
  - lose the information forever.
- The best way to review is
  - in a 45-minute study session.
  - in a 20-minute study session.
  - in three- to five-minute study sessions spaced out over time.

How did you do on the quiz? Check your answers: 1. c, 2. c, 3. a, 4. b, 5. c

"Today I will do what others won't, so I can accomplish what others can't."

Jerry Rice

### How Can I Remember What I Study?

Based on the above theories of memory and forgetting, here are some practical suggestions for storing information in LTM. Information stored in LTM can be retrieved for tests in college and for success in your career and personal life.

### Meaningful Organization

There is no better method of memory improvement than imposing your own form of personal organization on the material you are trying to remember. Psychologists have even suggested that your intelligence quotient (IQ) may be related to how well you have organized material you learned in the past. When learning new material, cluster facts and ideas into categories that are meaningful to you.

## ACTIVITY

### Magical Number Seven

Remember George Miller's Magical Number Seven Theory? It is more efficient to limit the number of categories to seven or less, although you can have subcategories. Examine the following list of words.

goat	horse	cow
carrot	cat	lettuce
banana	tomato	pig
celery	orange	peas
cherry	apple	strawberry

Look at the list for one minute. Then look away from the list and write down all the words you can recall. Record the number of words you remembered: \_\_\_\_\_

Note that the following lists are divided into categories: animals, crops, and tropical fruits.

<b>animals</b>	<b>crops</b>	<b>tropical fruits</b>
lion	wheat	banana
giraffe	beans	kiwi
kangaroo	corn	mango
coyote	hay	guava
bear	oats	orange

Look at the above list for one minute. Then look away from the list and write down the words you recall. Record the number of words you remembered: \_\_\_\_\_

You probably remembered more from the second list because the list is organized into categories. Notice that there are only five words in each category. Remember that it is easier to remember lists with seven items or less. If these words have some meaning for you, it is easier to remember them. A farmer from the Midwest would probably have an easier time remembering the crops. A person from Hawaii would probably remember the list of tropical fruits. We also tend to remember unusual items and the first and last items on the list. If you need to memorize a list, pay more attention to the mundane items and the items in the middle of the list.

## Visualization

Another very powerful memorization technique is visualization. The right side of the brain specializes in visual pictures and the left side in verbal functions. If you focus on the words only, you are using only half of your brain. If you can focus on the words and accompany them with pictures, you are using your brain in the most efficient way. Advertisers use pictures as powerful influences to motivate you to purchase their products. You can use the same power of visualization to enhance your studying. While you are studying history, picture what life would be like in that time period. In engineering, make pictures in your mind or on paper to illustrate scientific principles. Challenge yourself to see the pictures along with the words. Add movement to your pictures, as in a video. During a test, relax and recall the pictures.

## Recitation

Although scientists are still researching and learning how the memory works and how information is stored, we do know that recitation, rehearsal, and reviewing the ideas are powerful techniques for learning. Memories exist in the brain in the form of a chemical neural trace. Some researchers think that it takes about four or five seconds for this neural trace to be established in LTM. It is through recitation that we keep the ideas in our mind long enough to store them in LTM. Often students say they cannot remember the material that they have just read. The reason for this problem is not a lack of intelligence, but rather a simple lack of rehearsal. If information obtained through reading is stored in STM, it is very quickly forgotten. Say aloud or to yourself the material you want to remember. This process takes about five seconds.

Applying the recitation technique can help you remember names. When you are introduced to someone, first pay attention to make sure that you have heard the name correctly. Ask the person to repeat their name if necessary. Repeat the name out loud or in your mind. Say something like, "Glad to meet you, *Lydia*." Say the name silently to yourself five times to establish the neural trace. If possible, make a visual connection with the name. If the person's name is Frank, you might picture a hot dog, for example. Thinking about the name or reviewing it will help to access the name in the future.

Remember that most of the forgetting occurs in the first 20 minutes after learning something. Reviewing the material within 20 minutes is the fastest and most effective way to remember it. You will also need to review the information you have stored in LTM periodically so it is more accessible. This periodic review can be done effectively in three to five minutes.

## Develop an Interest

We tend to remember what interests us. People often have phenomenal memories when it comes to sports, automobiles, music, stamp collecting, or anything they consider fun or pursue as a hobby. Find something interesting in your college studies. If you are not interested in what you are studying, look for something interesting or even pretend that you are interested. Reward yourself for studying by doing something enjoyable.

Attitude has a significant impact on memory. Approaching your studies with a positive attitude will help you to find something interesting and make it easier to remember. In addition, the more you learn about a topic, the more interesting it becomes. Often we judge a subject as boring because we know nothing about it.

Another way to make something interesting is to look for personal meaning. How can I use this information in my future career? Does the information relate to my personal experience in some way? How can I use this information? What is the importance of this information? And finally, is this information likely to be on the test?

## See the Big Picture First

Imagine looking at a painting one inch at a time. It would be difficult to understand or appreciate a painting in this way. College students often approach reading a textbook in the same way. They focus on the small details without first getting an idea of the main points. By focusing on the details without looking at the main points, it is easy to get lost.

The first step in reading is to skim the chapter headings to form a mental outline of what you will be learning. Then read for detail. Think of the mind as a file cabinet or a computer. Major topics are like folders in which we file detailed information. When we need to find or access the information, we think of the major topic and look in the folder to find the details. If we put all of our papers into the file drawer without organization, it is difficult to find the information we need. Highlight or underline key ideas to focus on the main points and organize what you are learning.

"Knowledge is power, but enthusiasm pulls the switch."

Ivern Ball

"The secret of a good memory is attention, and attention to a subject depends on interest in it. We rarely forget what makes a deep impression on our mind."

Tyron Edwards



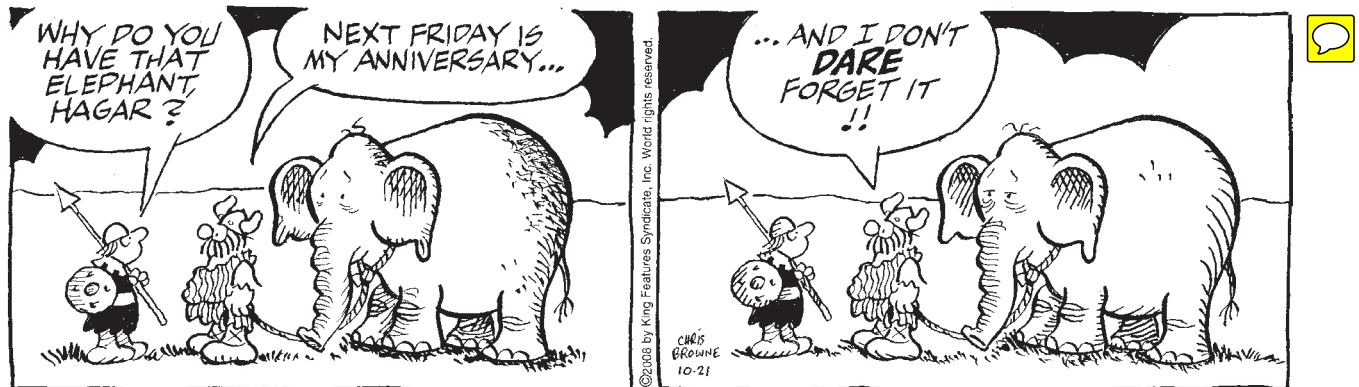
Be selective and focus on key ideas to increase learning efficiency. Herman Ebbinghaus studied the length of time needed to remember series of six nonsense syllables and 12 nonsense syllables.<sup>4</sup> We might assume that it would take twice as long to remember 12 syllables as it would six syllables. Ebbinghaus found that it took 15 times longer to memorize 12 syllables. The Magic Number Seven Theory seems to apply to the number of items that can be memorized efficiently.

Does this mean that we should try to remember only seven or less ideas in studying a textbook chapter? No—it is most efficient to identify seven or fewer key ideas and then cluster less important ideas under major headings. In this way, you can remember the key ideas in the chapter you are studying. The critical thinking required by this process also helps in remembering ideas and information.

## Intend to Remember

Tell yourself that you are going to remember. If you think you won't remember, you won't remember. This step also relates to positive thinking and self-confidence and will take some practice to apply. Once you have told yourself to remember, apply some of the above techniques such as organizing, visualizing, and reciting. If you intend to remember, you will pay attention, make an effort to understand, and use memory techniques to strengthen your memory.

One practical technique that involves intent to remember is the memory jogger. This involves doing something unusual to jog or trigger your memory. If you want to be sure to remember your books, place your car keys on the books. Since you cannot go anywhere without your keys, you will find them and remember the books too. Another application is putting your watch on your right hand to remember to do something. When you look at your left hand and notice that the watch is not there, the surprise will jog your memory for the item you wish to recall. You can be creative with this technique and come up with your own memory joggers.



## Distribute the Practice

Learning small amounts of material and reviewing frequently are more effective than a marathon study session. One research study showed that a task that took 30 minutes to learn in one day could be learned in 22 minutes if spread over two days. This is almost a 30 percent increase in efficiency.<sup>5</sup>

If you have a list of vocabulary words or formulas to learn, break the material into small parts and frequently review each part for a short period of time. Consider putting these facts or figures on index cards to carry with you in your purse or pocket. Use small

amounts of time to quickly review the cards. This technique works well because it prevents fatigue and helps to keep motivation high. One exception to the distributed practice rule is creative work such as writing a paper or doing an art project, where a longer time period is needed for creative inspiration and immediate follow-through.

A learning technique for distributed practice is summed up in the acronym **SAFMEDS**, which stands for Say All Fast for one Minute Each Day and Shuffle.<sup>6</sup> With this technique, you can easily and quickly learn 100 or more facts. To use this technique, prepare flash cards that contain the material to be learned (vocabulary, foreign language words, numbers, dates, places, names, formulas). For example, if you are learning Spanish, place the Spanish word on one side of the card and the English word on the other side. Just writing out the flash cards is an aid to learning and is often sufficient for learning the material. Once the cards are prepared, *say* the Spanish word and see if you can remember what it means in English. Look at the back of the card to see if your answer is correct. Do this with *all* of the cards as *fast* as you can for *one minute each day*. Then *shuffle* the cards and repeat the process the next day.

It is important that you do this activity quickly. Don't worry if you do not know the answer. Just flip each card over, quickly look at the answer, and put the cards that you missed into a separate pile. At the end of the minute, count the number of cards you answered correctly. You can learn even faster if you take the stack of cards you missed and practice them quickly one more time. Shuffling the cards helps you to remember the actual meanings of the words, instead of just the order in which they appear. In the case of the Spanish cards, turn the cards over and say each English word to see if you can remember the equivalent word in Spanish. Each day, the number of correct answers will increase, and you will have a concrete measure of your learning. Consider this activity as a fun and fast-moving game to challenge yourself.

## Create a Basic Background

You remember information by connecting it to things you already know. The more you know, the easier it is to make connections that make remembering easier. You will even find that it is easier to remember material toward the end of a college class because you have established a basic background at the beginning of the semester. With this in mind, freshman-level courses will be the most difficult in college because they form the basic background for your college education. College does become easier as you establish this basic background and practice effective study techniques.

You can enhance your basic background by reading a variety of books. Making reading a habit also enhances vocabulary, writing, and spelling. College provides many opportunities for expanding your reading horizons and areas of basic knowledge.

## Relax While Studying

The brain works much better when it is relaxed. As you become more confident in your study techniques, you can become more relaxed. Here are some suggestions to help you relax during study time.

- Use distributed practice to take away some of the pressure of learning; take breaks between periods of learning. Give yourself time to absorb the material.
- Plan ahead so that you do not have to cram. Waiting until the last minute to study produces anxiety that is counterproductive.
- If you are anxious, try a physical activity or relaxation exercise before study sessions. For example, imagine a warm, relaxing light beginning at the feet and moving slowly up the body to the top of the head. Feel each part of the body relax as the light makes contact with it. You will find other relaxation techniques in Chapter 12.

- If you are feeling frustrated, it is often a good idea to stop and come back to your studies later. You may gain insight into your studies while you are more relaxed and doing something else. You can often benefit from a fresh perspective.

## Journal Entry #1

Review the memory techniques explained in this chapter: meaningful organization, visualization, recitation, develop an interest, see the big picture, intend to remember, distribute the practice, create a basic background, and relax while studying. List and briefly explain at least three techniques you are willing to try, and give examples of how you would use each of the three memory techniques you select.

## Using Mnemonics and Other Memory Tricks

Memory tricks can be used to enhance your memory. These memory tricks include acrostics, acronyms, peg systems, and loci systems. These systems are called *mnemonics*, from the Greek word *mneme* which means “to remember.”

Mnemonic devices are very effective. A research study by Gerald R. Miller found that students who used mnemonic devices improved their test scores by up to 77 percent.<sup>7</sup> Mnemonics are effective because they help to organize material. They have been used throughout history, in part as a way to entertain people with amazing memory feats.

Mnemonics are best used for memorizing facts. They are not helpful for understanding or thinking critically about the information. Be sure to memorize your mnemonics carefully and review them right before exam time. Forgetting the mnemonic or a part of it can cause major problems.

### Acrostics

Acrostics are creative rhymes, songs, poems, or sentences that help us to remember. Maybe you previously learned some of these in school.

- Continents: Eat an Aspirin after a Nighttime Snack (Europe, Antarctica, Asia, Africa, Australia, North America, South America)
- Directions of the compass: Never Eat Sour Watermelons (North, East, South, West)
- Geological ages: Practically Every Old Man Plays Poker Regularly (Paleocene, Eocene, Oligocene, Miocene, Pliocene, Pleistocene, Recent)
- Guitar Strings: Eat All Dead Gophers Before Easter (E, A, D, G, B, E)
- Oceans: I Am a Person (Indian, Arctic, Atlantic, Pacific)
- Metric system in order: King Henry Drinks Much Dark Chocolate Milk (Kilometer, hectometer, decameter, meter, decimeter, centimeter, millimeter)
- Notes on the treble clef in music: Every Good Boy Does Fine (E, G, B, D, F)
- Classification in biology: Kings Play Cards on Fairly Good Soft Velvet (Kingdom, Phylum, Class, Order, Family, Genus, Species, Variety)

### Memorization Tricks

- Acrostics
- Acronyms
- Peg systems
- Loci systems
- Visual clues
- Say it aloud
- Have a routine
- Write it down

An effective way to invent your own acrostics is to first identify key ideas you need to remember, underline these key words or write them down as a list, and think of a word that starts with the first letter of each idea you want to remember. Rearrange the words if necessary to form a sentence. The more unusual the sentence, the easier it is to remember.

In addition to acrostics, there are many other creative memory aids:

- Days in each month: Thirty days hath September, April, June, and November. All the rest have 31, except February which has 28 until leap year gives it 29.
- Spelling rules: *i* before *e* except after *c*, or when sounding like *a* as in neighbor and weigh.
- Numbers: Can I remember the reciprocal? To remember the reciprocal of pi, count the letters in each word of the question above. The reciprocal of pi = .3 1 8 3 10

Mnemonics become more powerful when used with visualization. For example, if you are trying to remember the planets, use a mnemonic and then visualize Saturn as a hula-hoop dancer to remember that it has rings. Jupiter could be a king with a number of maids to represent its moons.

## Acronyms

Acronyms are commonly used as shortcuts in our language. The military is especially fond of using acronyms. For example, NASA is the acronym for the National Aeronautics and Space Administration. You can invent your own acronyms as a memory trick. Here are some common ones that students have used:

- The colors of the spectrum: Roy G. Biv (red, orange, yellow, green, blue, indigo, violet)
- The Great Lakes: HOMES (Huron, Ontario, Michigan, Erie, Superior)
- The stages of cell division in biology: IPMAT (interphase, prophase, metaphase, and telophase)

To make your own acronym, list the items you wish to remember. Use the first letter of each word to make a new word. The word you make can be an actual word or an invented word.

## Peg Systems

Peg systems start with numbers, typically 1 to 100. Each number is associated with an object. The object chosen to represent each number can be based on rhyme or on a logical association. The objects are memorized and used with a mental picture to recall a list. There are entertainers who can have the audience call out a list of 100 objects and then repeat all of the objects through use of a peg system. Here is an example of a commonly used peg system based on rhyme:

One	Bun	Six	Sticks
Two	Shoe	Seven	Heaven
Three	Tree	Eight	Gate
Four	Door	Nine	Wine
Five	Hive	Ten	Hen

For example, if I want to remember a grocery list consisting of milk, eggs, carrots, and butter, I would make associations between the peg and the item I want to remember.

The more unusual the association is, the better. I would start by making a visual connection between *bun*, my peg word, and *milk*, the first item on the list. I could picture dipping a bun into a glass of milk for a snack. Next I would make a connection between *shoe* and *eggs*. I could picture eggs being broken into my shoe as a joke. Next I would picture a *tree* with orange *carrots* hanging from it and then a *door* with *butter* dripping from the doorknob. The technique works because of the organization provided by the pegs and the power of visualization.

There are many variations of the peg system. One variation is using the letters of the alphabet instead of numbers. Another variation is to visualize objects and put them in a stack, one on top of the other, until you have a great tottering tower, like a totem pole telling a story. Still another variation is to use your body or your car as a peg system. Using our example of the grocery list above, visualize balancing the milk on your head, carrying eggs in your hands, having carrots tied around your waist and smearing butter on your feet. Remember that the more unusual the pictures, the easier they are to remember.

## Loci Systems

Loci or location systems use a series of familiar places to aid the memory. The Roman orators often used this system to remember the outline of a speech. For example, the speaker might connect the entry of a house with the introduction, the living room with the first main point, and each part of the speech with a different room. Again, this technique works through organization and visualization.

Another example of using a loci system to remember a speech or dramatic production is to imagine a long hallway. Mentally draw a picture of each topic or section you need to remember, and then hang each picture on the wall. As you are giving your speech or acting out your part in the play, visualize walking down the hallway and looking at the pictures on the wall to remind yourself of the next topic. For multiple topics, you can place signs over several hallway entrances labeling the contents of each hallway.

## Visual Clues

Visual clues are helpful memory devices. To remember your books, place them in front of the door so you will see them on your way to school. To remember to take your finished homework to school, put it in your car when you are done. To remember to fill a prescription, put the empty bottle on the front seat of your car. Tie a bright ribbon on your backpack to remind you to attend a meeting with your study group. When parking your car in the mall, look around and notice landmarks such as nearby stores or row numbers. When you enter a large department store, notice the items that are near the door you entered. Are you worried that you left the iron on? Tie a ribbon around the handle of the iron each time you turn it off or unplug it. To find out if you have all the items you need to go skiing, visualize yourself on the ski slope wearing all those items.

## Say It Aloud

Some people are auditory learners and can remember items by repeating them out loud. For example, if you want to remember where you hid your diamond ring; say it out loud a few times. Then reinforce the memory by making a visual picture of where you have hidden the ring. You can also use your auditory memory by making a rhyme or song to remember something. Commercials use this technique all the time to try to get you to remember a product and purchase it.

## Have a Routine

Do you have a difficult time trying to remember where you left your keys, wallet, or purse? Having a routine can greatly simplify your life and help you to remember. As you enter your house, hang your keys on a hook each time. Decide where you will place your wallet or purse and put it in the same place each time. When I leave for work, I have a mental checklist with four items: keys, purse, glasses, and cell phone.

## Write It Down

One of the easiest and most effective memory techniques is to simply write something down. Make a grocery list or to-do list, send yourself an email, or tape a note to your bathroom mirror or the dashboard of your car.

## Remembering Names

Many people have difficulty remembering names of other people in social or business situations. The reason we have difficulty in remembering names is that we do not take the time to store the name properly in our memories. When we first meet someone, we are often distracted or thinking about ourselves. We are trying to remember our own names or wondering what impression we are making on the other person.

To remember a name, first make sure you have heard the name correctly. If you have not heard the name, there is no way you can remember it. Ask the person to repeat his or her name or check to see if you have heard it correctly. Immediately use the name. For example, say “It is nice to meet you, *Nancy*.” If you can mentally repeat the name about five times, you have a good chance of remembering it. You can improve the chances of remembering the name if you can make an association. For example, you might think, “She looks like my daughter’s friend Nancy.” Some people remember names by making a rhyme such as “fancy Nancy.”

## Journal Entry #2

Review the memory tricks explained in this chapter: acrostics, acronyms, peg systems, loci systems, visual clues, say it aloud, have a routine, write it down, and remembering names. List and briefly explain at least three memory tricks you are willing to try, and give examples of how you would use each of the three memory tricks you select.

## Optimize Your Brain Power

The mind can be strengthened and remain healthy throughout life. Scientists have studied a group of nuns from Mankato, Minnesota, who have lived long lives and suffer less from dementia and brain diseases than the general population. These nuns have lived a long time because they do not drink to excess or smoke. They have kept their minds healthy into old age by staying mentally active. They keep active by discussing current events, playing cards, practicing math problems, and doing crossword puzzles. Arnold Scheibel,

head of the UCLA Brain Institute, gives the following suggestions for strengthening your mind.

- Do jigsaw and crossword puzzles.
- Play a musical instrument.
- Fix something. The mental challenge stimulates the brain.
- Participate in the arts. Draw or paint something.
- Dance. Exercise and rhythm are good for the brain.
- Do aerobic exercise. This promotes blood flow to the brain.
- Meet and interact with interesting people.
- Read challenging books.
- Take a college class.<sup>8</sup>

Doing these kinds of activities can actually stimulate the development of neurons and nerve connections in the brain so that the brain functions more efficiently. The good news is that you can do this at any age.

Besides doing mental exercises to strengthen your brain, you can take other actions to keep your brain healthy. Here are some ideas:

1. **Do aerobic exercise.** Exercise improves the flow of oxygen to the brain. The brain needs oxygen to function. Researchers have just found that the human brain can grow new nerve cells by putting subjects on a three-month aerobic workout regimen. It was interesting to note that these new nerve cells could be generated at any age and are important in reversing the aging process and delaying the onset of Alzheimer's disease or other cognitive disorders.<sup>9</sup> For optimum health and learning, it is important to exercise the body as well as the mind.
2. **Get enough rest.** ~~Nobel laureate Francis Crick, who studies the brain at the Salk Institute, proposes that the purpose of sleep is to allow the brain to "take out the trash." Sleep provides time for the brain to review the events of the day and to store what is needed and discard what is not worth remembering.~~ During sleep, the brain sorts memories and stores significant ones in long-term memory. Studies have shown that when humans and lab animals are taught a new task and deprived of sleep, they do not perform the task the next day as well as non-sleep-deprived subjects.<sup>10</sup> Chronic lack of sleep can even lead to death.
3. **Eat a balanced, low-fat diet.** The brain needs nutrients, vitamins, and minerals to be healthy. Low-fat diets have been shown to improve mental performance.<sup>11</sup>
4. **Eat proteins and carbohydrates.** Proteins are the building blocks of neurotransmitters that increase mental activity. Carbohydrates provide energy and are the building blocks of neurotransmitters that have a calming effect.<sup>12</sup>
5. **Drink caffeine in moderation.** Caffeine can make you feel stressed, making it difficult to think.
6. **Don't abuse drugs or alcohol.** These substances kill brain cells and change brain chemistry.
7. **Use safety gear.** Wear a seat belt when driving and a helmet when biking or skating to reduce head injuries.



## Journal Entry #3

What is your plan for keeping your brain healthy throughout life? Include some of these ideas: diet, exercise, music, art, games, fixing something, challenging your brain, social contacts, and continued learning.

## Improving Your Reading

### Myths about Reading

Effective reading techniques are crucial to college success. The level and quantity of reading expected in college may be greatly increased over what you have experienced in the past. The following are some myths about reading that cause problems for many college students.

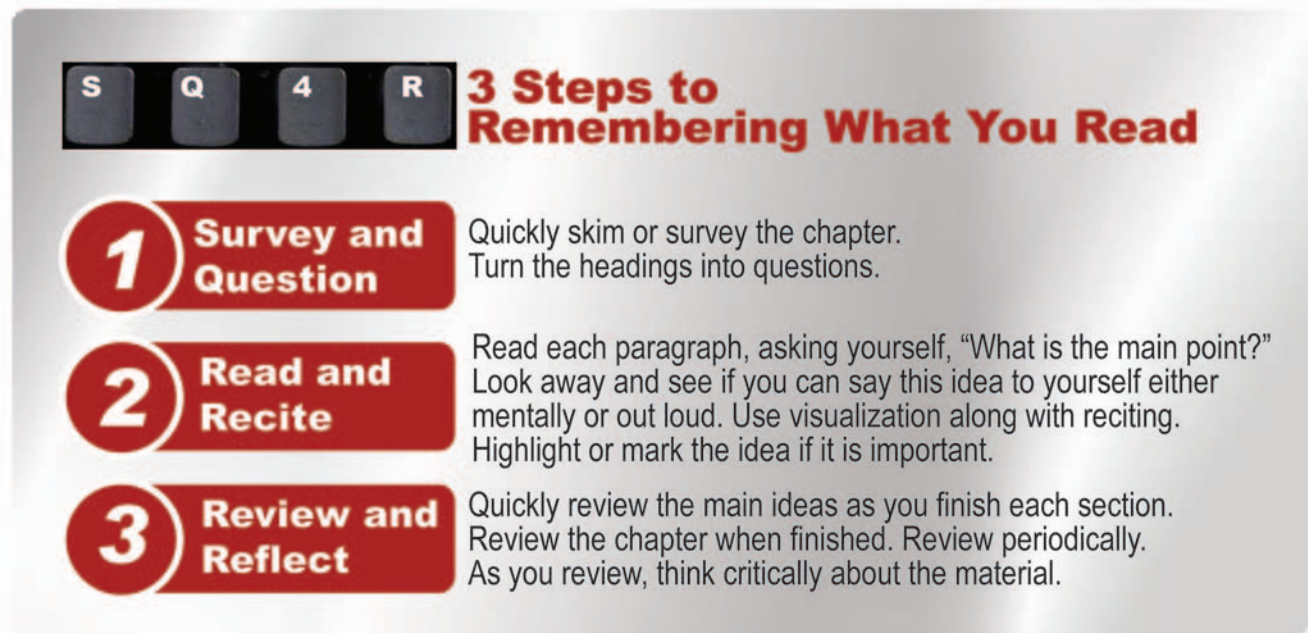
1. **“If I read a chapter, I should remember what I read.”** Many students say that they read the chapter, but “it goes in one ear and out the other.” After such a frustrating experience, students often conclude that they cannot read well or are not intelligent enough to succeed in college. If you just read the chapter, you have stored it in short-term memory, which lasts about 30 seconds. Reading a chapter takes a lot of effort. You want to make sure the effort you have invested pays off by storing the material in long-term memory. You can then retrieve the information in the future, as well as pass exams. Material is stored in long-term memory through rehearsal or review. Without review, you will not remember.
2. **“I do not need to read if I go to class.”** The role of the college professor is to supplement material in the text and increase student understanding of the material. Some professors do not even cover topics contained in the text and consider it the student’s responsibility to learn textbook material. If you do not read the text, you may miss out on important material that is not presented during class. Reading the text also helps you understand the material that the professor presents.
3. **“Practice makes perfect.”** Students think that if they keep reading the way they are reading, their reading will get better. The truth is that “perfect practice makes perfect.” If you are reading in a way that enhances memory, you will get better and better. Success in college reading may mean learning some new reading habits. You will learn about effective reading habits in this chapter.
4. **“Learn the facts that will be on the test.”** Focusing on details without looking at the big picture can slow down learning and lead to frustration. If you start with the big picture or outline, then it is easier to learn the details.

### A Study System for Reading a College Text: SQ4R

There are many systems for reading a college textbook. All successful systems involve ways to store information in long-term memory: recognizing major points, organizing material to be learned, reviewing, intending to remember, and critical thinking about reading. The crucial step in transferring information to long-term memory is rehearsal, reviewing, or reciting. You need to keep information in your mind for five to 15 seconds in order for it to be stored in long-term memory. The **SQ4R system (Survey, Question, Read, Recite, Review, Reflect)** is a simple and effective way to store information in long-term memory. This system was derived from an information-processing theory developed by



Francis P. Robinson in 1941 for use by military personnel attending college during World War II. Since that time, the system has been used by many colleges to teach students effective study skills. The system can be broken down into three steps.



**S** **Q** **4** **R** **3 Steps to Remembering What You Read**

- 1 Survey and Question** Quickly skim or survey the chapter. Turn the headings into questions.
- 2 Read and Recite** Read each paragraph, asking yourself, "What is the main point?" Look away and see if you can say this idea to yourself either mentally or out loud. Use visualization along with reciting. Highlight or mark the idea if it is important.
- 3 Review and Reflect** Quickly review the main ideas as you finish each section. Review the chapter when finished. Review periodically. As you review, think critically about the material.

Figure 7.2

**Step 1: Survey and Question.** The first step is to survey and question the chapter before you begin reading. Read the title and first paragraph or introduction to the chapter and then look quickly through the chapter, letting your eyes glide across bold headings, diagrams, illustrations, and photos. Read the last paragraph or summary of the chapter. This process should take five minutes or less for a typical chapter in a college textbook.

While you are surveying the chapter, ask yourself questions. Take each major heading in the chapter and turn it into a question. For example, in this section of the book you might ask: What is a system for reading a college text? Why do I need a system? What is SQ4R? What is the first step of SQ4R? You can also ask some general questions as you survey the chapter: What is the main point? What will I learn? Do I know something about this? Can I find something that interests me? How can I use this? Does this relate to something said in class? What does this mean? Is this a possible test question? Asking questions will help you to become an active reader and to find some personal meaning in the content that will help you remember it. If you at least survey and question the relevant textbook material before you go to class, you will have the advantage of being familiar with some of the key ideas to be discussed.

There are several benefits to taking this first step:

- This is the first step in rehearsal for storage of information into long-term memory.
- The quick survey is a warmup for the brain, similar to an athlete's warmup before exercise.
- A survey step is also good practice for improving your reading speed.
- Reading to answer questions increases comprehension, sparks interest, and has the added bonus of keeping you awake while reading.

“The important thing is to not stop questioning.”  
Albert Einstein

If you want to be able to read faster, improve your reading comprehension, and increase retention of your reading material, practice the survey and question step before you begin your detailed reading.

**Step 2: Read and Recite.** The second step in reading a text is to read and recite. Read each paragraph and look for the most important point or topic sentence. If the point is important, highlight or underline it. You might use different colors to organize the ideas. You can also make a notation or outline in the margin of the text if the point is especially significant, meaningful, useful, or likely to appear on an exam. A picture, diagram, or chart drawn in the margin is a great way to use visualization to improve retention of the material. If you are reading online, take notes on the important points or use cut and paste to collect the main ideas in a separate document.

Next, look away and see if you can say the main point to yourself either silently or out loud. Reciting is even more powerful if you combine it with visualization. Make a video in your head to illustrate what you are learning. Include color, movement, and sound if possible. Reciting is crucial to long-term memory storage. It will also keep you awake. Beginning college students will find this step a challenge, but practice makes it a habit that becomes easier and easier.

If you read a paragraph or section and do not understand the main point, try these techniques:

1. **Notice any vocabulary or technical terms that are unfamiliar.** Look up these words in a dictionary or in the glossary at the back of the book. Use index cards; write the words on one side and the definition on the other side. Use the SAFMEDS technique (Say All Fast in one Minute Each Day Shuffle) discussed earlier in this chapter. You are likely to see these vocabulary words on quizzes and exams.
2. **Read the paragraph again.** Until you get into the habit of searching for the main point, you may need to reread a paragraph until you understand. If this does not work, reread the paragraphs before and after the one you do not understand.
3. **Write a question in the margin and ask your instructor or tutor to explain.** College instructors have office hours set aside to assist students with questions, and faculty are generally favorably impressed with students who care enough to ask questions. Most colleges offer tutoring free of charge.
4. **If you are really frustrated, put your reading away and come back to it later.** You may be able to relax and gain some insight about the material.
5. **Make sure you have the proper background for the course.** Take the introductory course first.
6. **Assess your reading skills.** Colleges offer reading assessments, and counselors can help you understand your skill level and suggest appropriate courses. Most colleges offer reading courses that can help you to be successful in college.
7. **If you have always had a problem with reading, you may have a learning disability.** A person with a learning disability is of average or higher-than-average intelligence, but has a problem that interferes with learning. Most colleges offer assessment that can help you understand your learning disability and tutoring that is designed to help you to compensate for the disability.

**Step 3: Review and Reflect.** The last step in reading is to review and reflect. After each section, quickly review what you have highlighted or underlined. Again, ask questions. How can I use this information? How does it relate to what I already know? What is most important? What is likely to be on the exam? Is it true? Learn to think critically about the material you have learned.

When you finish the chapter, quickly (in a couple of minutes) look over the highlights again. This last step, review and reflect, is another opportunity for rehearsal. At this point, you have stored the information in long-term memory and want to make sure that you can access the information again in the future. Think of this last step as a creative step in which you put the pieces together, gain an understanding, and begin to think of how you can apply your new knowledge to your personal life. This is the true reward of studying.

Review is faster, easier, and more effective if done immediately. As discussed previously in this chapter, most forgetting occurs in the first 20 minutes after exposure to new information. If you wait 24 hours to review, you will probably have forgotten 80 percent of the material and will have to spend a longer time in review. Review periodically to make sure that you can access the material easily in the future, and review again right before the test.

As you read about the above steps, you may think that this process takes a lot of time. Remember that it is not how much you read, but how you read that is important. In reality, the SQ4R technique is a time-saver in that you do not have to reread all the material before the test. You just need to quickly review information that is stored in long-term memory. Rereading can be purely mechanical and consume your time with little payoff. Rather than rereading, spend your time reciting the important points. With proper review, you can remember 80 to 90 percent of the material.

In his book *Accelerated Learning*, Colin Rose states that you can retain 88 percent of the material you study using the following review schedule.<sup>13</sup> He also notes that the rate of retention using this schedule is four times better than the expected curve of forgetting.

1. Review immediately within 30 seconds.
2. Review after a few minutes.
3. Review after one hour.
4. Review a day later after an overnight rest.
5. Review after a week.
6. Review after one month.

Suggestions for review schedules vary, but the key point is that review is most effective when it is done in short sessions spaced out over time.

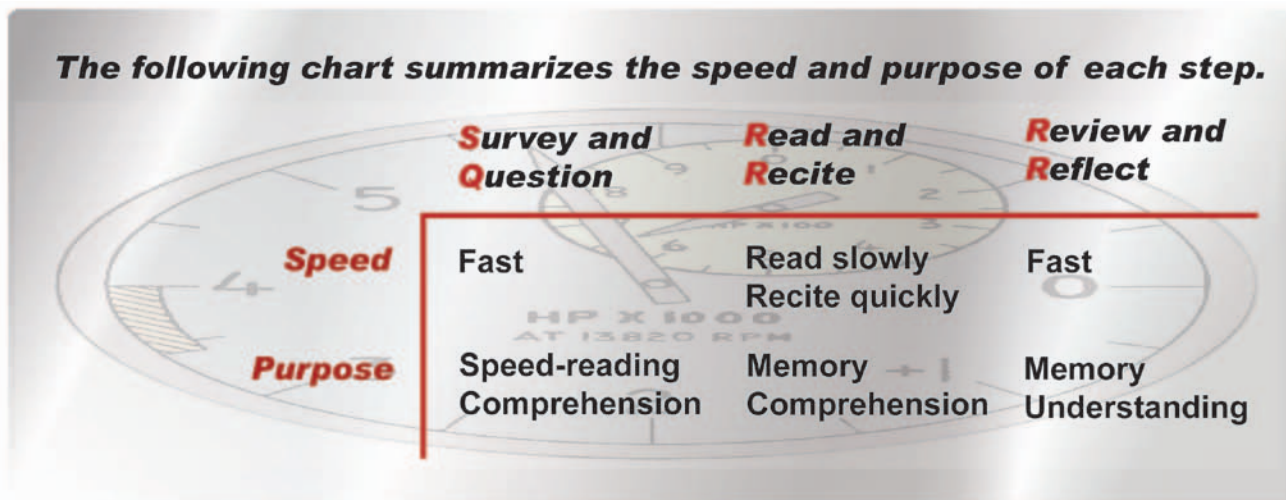


Figure 7.3

## Online Reading Strategies

To read efficiently, you will need some reading strategies for the vast amount of online material you will use in college and in everyday life. First, determine your purpose for reading. If you are reading for entertainment, to interact with others, or to find needed information, quickly scan the material to see if it meets your needs. Look for bulleted lists, menu bars, highlighted words, and headers; read only what suits your purpose. Avoid getting lost on your search by using browser tools such as favorites/bookmarks or the history, which is a list of the pages you have visited before. Use multiple browser windows to compare or synthesize information. To avoid eyestrain while reading online, be sure to take breaks and look away from the screen. It is important to get up and stretch periodically. If you are studying reading for an online course, first scan the material for key words. Then carefully read each section and summarize what you have learned. If you cannot do this, reread the section. If you are an auditory learner, you can repeat to yourself what you have learned, either silently or aloud. If you are a kinesthetic learner who learns by the hands-on approach, take notes on the important points. You can save time by opening a separate document in a new window and cutting and pasting the important points into your notes. Be sure to include the source of the material, so that you can use it in writing papers or find the material again. As in reading print material, use some techniques to assure good comprehension: as you read each section, visualize what you are reading, ask questions, and think critically about the material.

### Journal Entry #4

Describe a system for college reading. Include these ideas: survey, question, read, recite, review, and reflect.

## Guidelines for Marking Your Textbook

Marking your textbook can help you pick out what is important, save time, and review the material. It is a great way to reinforce your memory and help you access the material you have learned. In high school, you were given the command, “Thou shalt not mark in thy book!” College is different. You have paid for the book and need to use it as a tool. Even if you plan to sell your book, you can still mark it up. Here are some guidelines for marking your book:

- Underline or mark the key ideas in your text. You don’t have to underline complete sentences; just underline enough to make sense when you review your markings. This technique works especially well for kinesthetics or tactile learners. If reading online, use the highlighter tool to mark the main points and then cut and paste the main points into a separate document.
- Aim for marking or highlighting about 20 percent of the most important material. If you mark too much of your reading, it will be difficult to review the main points.
- Read each paragraph first. Ask yourself, “What is the main point?” Highlight or mark the main point if it is important. Not every paragraph has a main point that needs to be marked.
- Use other marks to help you organize what you have read. Write in numbers or letters and use different colors to help you organize ideas.

- Most college texts have wide margins. Use these margins to write down questions, outlines, or key points to remember.
- Learn to be brief, fast, and neat in your marking or highlighting.
- If you are tempted to mark too much, use the double system of first underlining with a pencil as much as you want and then using a highlighter to pick out the most important 20 percent of the material in the chapter.
- Use different kinds of marks and symbols, such as the following:
  - Single or double underlines
  - Brackets around an important paragraph
  - Numbers or letters to organize points
  - Circles or squares to make important words stand out
  - An asterisk or star in the margin for a very important idea
  - A question mark next to something you do not understand
  - “DEF” in the margin to point out a definition
  - Use your imagination to come up with your own symbols
- Learn to recognize organizing patterns in your reading. These patterns will help you to pick out and mark the important ideas.
  - **The listing pattern.** Identify and mark the items in the list. Use numbers and letters to identify the parts of a list.
  - **The sequence pattern.** This pattern presents a list in a certain order. Note the items in the list and the order by using numbers or letters.
  - **The definition pattern.** Circle the word being defined. Underline the definition.
  - **The comparison/contrast pattern.** This pattern explains similarities or differences. Underline or mark these.
  - **The cause/effect pattern.** This pattern describes the reasons things happen. Underline or mark the cause and the effect.
- Quickly review the important points after you have marked each section. Quickly review again when you have finished the chapter. If you review within 20 minutes, the review will be faster and easier.

## Improving Reading

Test what you have learned by circling the letters of the correct answers to the following questions.

1. If you have read the chapter and can't remember what you have read,
  - a. read the chapter again.
  - b. remember to select important points and review them.
  - c. the material is stored in long-term memory.
  
2. When you start reading a new textbook,
  - a. begin with chapter one.
  - b. focus on the details you will need to remember.
  - c. skim over the text to get a general idea of what you will be reading.
  
3. The first step in reading a chapter in a college textbook is to
  - a. survey and question.
  - b. read and recite.
  - c. review and reflect.
  
4. As you are reading each paragraph in a college textbook, it is most important to
  - a. read quickly.
  - b. identify the main point and recite it.
  - c. focus on the details first.
  
5. When marking a college textbook, it is recommended to mark about
  - a. 50%.
  - b. 30%.
  - c. 20%.

How did you do on the quiz? Check your answers: 1. b, 2. c, 3. a, 4. b, 5. c

## Reading for Speed and Comprehension

In *How to Read for Speed and Comprehension*, Gordon Wainwright suggests using different gears, or speeds, when reading for different purposes.<sup>14</sup> Understanding these four gears can be helpful for college students.

1. **Studying.** In this gear, the maximum reading speed is about 200 words per minute. It is used for material that is difficult or unfamiliar, such as a college textbook. For this material, a high quality of retention is required. It involves the steps described in SQ4R.
2. **Slow reading.** In this gear, reading speed ranges from 150 to 300 wpm. It is used for material that is fairly difficult when a good quality of retention is desired.
3. **Rapid reading.** In rapid reading, speeds range from 300 to 800 wpm. It is used for average or easy material. Use this gear for review of familiar material.
4. **Skimming.** Skimming is a type of very fast reading done at 800 to 1000 wpm. With practice, it is possible to skim at 2000 to 3000 wpm. Using this technique, the eyes glide quickly down the page looking for specific information. Not every group of words or line is read. The eyes focus quickly on key ideas, bold headings, and titles. The purpose is to get a quick overview of the important ideas in the material.



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Different reading speeds are used for different purposes. In college reading, it is more important to have good comprehension and retention than speed. However, we all live busy lives, and many college students today try to combine study, work, family, and social life. Learning to read faster is important to survival. You can learn to read faster by practicing skimming as a first step in reading. The next step is to slow down, look for the major points, and rehearse them so that they are stored in long-term memory. Using the SQ4R study technique described above will guide you through the process so that you can remember what you read.

## What to Do If Your Reading Goes in One Ear and out the Other

### 1. Silence your inner critic.

If you have always told yourself that you are a poor reader or hate reading, these thoughts make it difficult to read. Think positively and tell yourself that with some effort, you can read and understand. Focus on what you can do, rather than what you can't do.

### 2. Look for the key ideas and underline them.

### 3. Try visualization.

Make a mental picture or video with the material you are reading.

### 4. Look for personal meaning.

Can you relate the material to your life in any way?

### 5. Do a quick scan of the material to find some major points and then reread the material closely.

### 6. Try talking to the text as you read it. Ask questions. Why is this important? Do you know anything about this? Do you agree or disagree? Do you think it is a good or bad idea? Can you use this information in the future? Can you find something interesting in the text? Challenge the material and think critically about it. Make humorous remarks. Imagine yourself in the situation. What would it be like and what would you do? You can write your comments in the text or do this silently in your head.

## Improving Reading Concentration

Hank Aaron said that what separates the superstar from the average ballplayer is that the superstar concentrates just a little longer. Athletes are very aware of the power of concentration in improving athletic performance. Coaches remind athletes to focus on the ball and to develop good powers of concentration and visualization. Being able to concentrate on your reading helps you to study more efficiently.

It is important to have a regular place for studying that has all the needed materials. You will need a table or desk with space for a computer, space for writing, and a comfortable chair. Keep a good supply of writing materials, computer supplies, and reference materials. To minimize fatigue and eyestrain, good lighting is essential. It is best to have an overhead light and a lamp. Place the lamp to your left if you are right-handed. In this way, you will not be writing in a shadow. Do the reverse if you are left-handed. If you have space, use two lamps with one placed on each side. Eliminate glare by using a lampshade. Study lamps often come with a deflector on the bottom of the lampshade that further eliminates glare. Lighter colors on your desk and wall also help to eliminate glare and fatigue.

In setting up your regular place for studying, keep in mind your environmental preferences as identified by your PEPS learning style inventory. Consider these factors:

- Do you need a quiet environment to focus on your studies?
- Do you prefer bright or dim light?
- Do you prefer a warm or cool environment?
- Do you prefer learning by yourself or with others?
- Do you study best in the morning or the afternoon?

Having and using a well-equipped and comfortable study place reduces external distractions. Internal distractions are many and varied and may be more difficult to manage. Internal distractions include being hungry, tired, or ill. It is a good idea to eat and be well rested before reading any course material. If you are ill, rest and get well. Study when you feel better. Many internal distractions are mental, such as personal problems, worrying about grades, lack of interest or motivation, frustration, or just daydreaming.

Here are some ideas for dealing with internal mental distractions while reading.

1. **Become an active reader.** Read to answer questions. Search for the main idea. Recite or re-say the main idea in your mind. Reflect and think critically about the material you are reading. Mark or highlight the text. Visualize what you are reading.
2. **Remind yourself of your purpose for reading.** Think of your future college and career goals.
3. **Give yourself permission to daydream.** If you like to daydream, give yourself permission to daydream as a break from your studies. Come back to your studies with a more relaxed attitude.
4. **Plan to deal with worry.** Worry is not a very good motivator and it interferes with memory. Take some positive action to deal with problems that cause you to worry. If you are worried about your grades, what can you do right now to improve your chances of making better grades? See a college counselor if worrying about personal problems interferes with studying.
5. **Break the task into small parts.** If the task seems overwhelming, break it into small parts and do the first part. If you have 400 pages to read in 10 days, read 40 pages each day. Make a schedule that allows time to read each day until you have accomplished your goal. Use distributed practice in your studies. Study for a short time each day rather than holding a marathon study session before the test.

### Improving Reading Concentration

1. Become an active reader.
2. Remember your purpose.
3. Use daydreaming to relax.
5. Plan to deal with worry.
6. Break tasks into small parts.



## QUIZ

### Reading Speed, Comprehension, and Concentration

Test what you have learned by circling the letters of the correct answers to the following questions.

1. A friend is having difficulties with reading in college and has stated that he is frustrated because the reading “goes in one ear and out the other.” What is the best advice that you could give your friend?
  - a. Don’t worry. It will get better with practice.
  - b. Question the material and search for personal meaning.
  - c. Search for the details and memorize them.
2. Learn to increase your reading speed by
  - a. applying all steps of SQ4R.
  - b. starting with skimming.
  - c. learning to concentrate.
3. Improve reading comprehension by
  - a. applying the steps of SQ4R.
  - b. reading as quickly as possible.
  - c. worrying about what you will remember.
4. Improve reading concentration by
  - a. reading a large amount of material at one time.
  - b. reading without questioning.
  - c. having a regular place for studying with needed materials.
5. To deal with mental distractions that interfere with reading,
  - a. practice “Be Here Now.”
  - b. ignore personal problems.
  - c. never daydream while reading.

How did you do on the quiz? Check your answers: 1. b, 2. b, 3. a, 4. c, 5. a

### Reading Strategies for Different Subjects

While the SQ4R technique is a good general strategy for reading textbook material, there are steps that you will need to add depending on the subject area you are studying.

#### Math

1. Make sure you have the proper prerequisites or background courses before you begin your math class.
2. When skimming a math book, keep in mind that many of the topics will be unfamiliar to you. You should be able to understand the first few pages and build your knowledge from there. If all the concepts are familiar to you, you may be taking a class that you do not need.
3. It is not enough to read and understand mathematical concepts. Make sure that you add practice to your study system when studying math. Practice gives you the self-confidence to relax when working with math.
4. It is helpful to read over your math book before you go to class so that you will know what areas need special attention.
5. Focus on understanding the math problems and concepts rather than on memorizing problems.

6. Do not get behind in your math studies. You need to understand the first step before you can go on to the next.
7. Ask for help as soon as you have difficulties.

### **Science**

1. In science classes, the scientific method is used to describe the world. The scientific method relies on questioning, observing, hypothesizing, researching, and analyzing. You will learn about theories and scientific principles. Highlight or mark theories, names of scientists, definitions, concepts, and procedures.
2. Understand the scientific principles and use flash cards to remember details and formulas.
3. Study the charts, diagrams, tables, and graphs. Draw your own pictures and graphs to get a visual picture of the material.
4. Use lab time as an opportunity to practice the theories and principles that you have learned.

### **Social and Behavioral Sciences**

1. Social and behavioral scientists focus on principles of behavior, theories, and research. Notice that there are different theories that explain the same phenomena. Highlight, underline, and summarize these theories in your own words.
2. When looking at the research, ask yourself what the point of the research was, who conducted the research, when the research was completed, what data was collected, and what conclusions were drawn.
3. Think of practical applications of theories.
4. Use flash cards to remember details.

### **Literature Courses**

When taking a course in literature, you will be asked to understand, appreciate, interpret, evaluate, and write about the literature.

1. Underline the names of characters and write plot summaries.
2. Write notes about your evaluation of literary works.
3. Make flash cards to remember literary terms.
4. Write down important quotes or note page numbers on a separate piece of paper so that you don't have to go back and find them later when you are writing about a work.

### **Foreign Language Courses**

Foreign language courses require memorization and practice.

1. Distribute the practice. Practice a small amount each day. It is not possible to learn everything at once.
2. Complete the exercises as a way to practice and remember.
3. Study out loud.
4. Practice speaking the language with others.
5. Use flash cards to remember vocabulary.
6. Make charts to practice verb conjugations.
7. Ask for help if you do not understand.
8. Learn to think in the foreign language. Translating from English causes confusion because the structures of languages are different.

"Whatever the mind of man can conceive and believe, it can achieve."  
Napoleon Hill

You can improve your memory and your reading (as well as your life) by using positive thinking. Positive thinking involves two aspects: thinking about yourself and thinking about the world around you. When you think positively about yourself, you develop confidence in your abilities and become more capable of whatever you are attempting to do. When you think positively about the world around you, you look for possibilities and find interest in what you are doing.

Golfer Arnold Palmer has won many trophies, but places high value on a plaque on his wall with a poem by C.W. Longenecker:

If you think you are beaten, you are.  
If you think you dare not, you don't.  
If you like to win but think you can't,  
It's almost certain that you won't.

Life's battles don't always go  
To the stronger woman or man,  
But sooner or later, those who win  
Are those who think they can.<sup>15</sup>

Success in athletics, school, or any other endeavor begins with positive thinking. To remember anything, you first have to believe that you can remember. Trust in your abilities. Then apply memory techniques to help you to remember. If you think that you cannot remember, you will not even try. To be a good reader, you need to think that you can become a good reader and then work

toward learning, applying, and practicing good reading techniques.

The second part of positive thinking involves thinking about the world around you. If you can convince yourself that the world and your college studies are full of interesting possibilities, you can start on a journey of adventure to discover new ideas. It is easier to remember and to read if you can find the subject interesting. If the topic is interesting, you will learn more about it. The more you learn about a topic, the more interesting it becomes, and you are well on your way in your journey of discovery. If you tell yourself that the task is boring, you will struggle and find the task difficult. You will also find it difficult to continue.

You can improve your reading through positive thinking. Read with the intent to remember and use reading techniques that work for you. We remember what interests us, and having a positive attitude helps us to find something interesting. To find something interesting, look for personal meaning. How can I use this information? Does it relate to something I know? Will this information be useful in my future career? Why is this information important? Write down your personal goals and remind yourself of your purpose for attending college. You are not just completing an assignment: you are on a path to discovery.

To be successful in college and to remember what you read, start with the belief that you can be successful. Anticipate that the journey will be interesting and full of possibilities. Enjoy the journey!

### Journal Entry #5

How can you use positive thinking to improve memory, reading, and success in college? Use any of these questions to guide your thinking:

- How can I think positively about myself?
- How can I think positively about my college experience?
- What is the connection between belief and success?
- How can positive thinking make college more fun?

## Improving Memory and Reading

Go to <http://www.collegesuccess1.com/> for Word files of the Journal Entries 

### Success over the Internet

Visit the *College Success Website* at <http://www.collegesuccess1.com/>

The *College Success Website* is continually updated with new topics and links to the material presented in this chapter. Topics include:

- Memory techniques
- Reading strategies
- How to concentrate
- How to highlight a textbook
- Speed reading
- How to study science
- Study groups
- Examples of mnemonics

Contact your instructor if you need assistance in accessing the *College Success Website*.

### Notes

1. G. A. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information," *Psychological Review* 63 (March 1956): 81–97.
2. Colin Rose, *Accelerated Learning* (New York: Dell Publishing, 1985), 33–36.
3. *Ibid.*, 50–51.
4. Walter Pauk, *How to Study in College* (Boston: Houghton Mifflin, 1989), 96–97.
5. Rose, *Accelerated Learning*, 34.
6. Adapted from Paul Chance, *Learning and Behavior* (Pacific Grove, CA: Brooks/Cole, 1979), 301.
7. Pauk, *How to Study in College*, 108.
8. Daniel Golden, "Building a Better Brain," *Life Magazine*, July 1994, 63–70.
9. Mary Carmichael, "Stronger, Faster, Smarter," *Newsweek*, March 26, 2007, 38–46.
10. Scott LaFee, "A Chronic Lack of Sleep Can Lead to the Big Sleep," *San Diego Union Tribune*, October 8, 1997.
11. Randy Blaun, "How to Eat Smart," *Psychology Today*, May/June 1996, 35.


12. Ibid.
13. Rose, *Accelerated Learning*, 51.
14. Gordon R. Wainwright, *How to Read for Speed and Comprehension* (NJ: Prentice-Hall, 1977), 100–101.
15. Rob Gilbert, ed., *Bits and Pieces* (Fairfield, NJ: The Economics Press, 1998), Vol. R, No. 40, p. 12.



Name \_\_\_\_\_ Date \_\_\_\_\_

Review the main ideas on improving memory and reading. Based on these ideas, how would you be successful in the following situations? You may want to do this as a group activity in your class.

1. You just read the assigned chapter in economics and cannot remember what you read. It went in one ear and out the other.
2. In your anatomy and physiology class, you are required to remember the scientific names for 100 different muscles in the body.
3. You signed up for a philosophy class because it meets general education requirements. You are not interested in the class at all.
4. You have a midterm in your literature class and have to read 400 pages in one month.

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5. You must take American history to graduate from college. You think that history is boring.
  6. You have been introduced to an important business contact and would like to remember his/her name.
  7. You are enrolled in an algebra class. You continually remind yourself that you have never been good at math. You don't think that you will pass this class.
  8. You have noticed that your grandmother is becoming very forgetful. You want to do whatever is possible to keep your mind healthy as you age.



Name \_\_\_\_\_

Date \_\_\_\_\_

**Part 1.** Your professor will read a list of 15 items. Do not write them down. After listening to this list, see how many you can remember and write them here.

- |    |     |     |
|----|-----|-----|
| 1. | 6.  | 11. |
| 2. | 7.  | 12. |
| 3. | 8.  | 13. |
| 4. | 9.  | 14. |
| 5. | 10. | 15. |

After your professor has given you the answers, write the number of words you remembered: \_\_\_\_\_

**Part 2.** Your professor will discuss memory techniques that you can use to improve your test scores and then will read another list. Again, do not write the words down, but try to apply the recommended techniques. Write as many words as you can remember.

- |    |     |     |
|----|-----|-----|
| 1. | 6.  | 11. |
| 2. | 7.  | 12. |
| 3. | 8.  | 13. |
| 4. | 9.  | 14. |
| 5. | 10. | 15. |

How many words did you remember this time? \_\_\_\_\_



# Practice with Mnemonics

Name \_\_\_\_\_ Date \_\_\_\_\_

Join with a group of students in your class to invent some acrostics and acronyms.

## Acrostics

Acrostics are creative rhymes, songs, poems, or sentences that help us to remember. To write an acrostic, think of a word that starts with the same letter as each idea you want to remember. Sometimes you can rearrange the words if necessary to form a sentence. At other times, it is necessary to keep the words in order. The more unusual the sentence, the easier it is to remember.

**Example:** Classification in biology: Kings Play Cards on Fairly Good Soft Velvet (Kingdom, Phylum, Class, Order, Family, Genus, Species, Variety)

Create an acrostic for the planets in the solar system. Keep the words in the same order as the planets from closest to the sun to farthest from the sun.

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto

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## Acronyms

To make your own acronym, list the items you wish to remember. Use the first letter of each word to make a new word. The new word you invented can be an actual word or an invented word.

**Example:** The Great Lakes: HOMES (Huron, Ontario, Michigan, Erie, and Superior)

The following are the excretory organs of the body. Make an acronym to remember them. Rearrange the words if necessary.

intestines, liver, lungs, kidneys, skin

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Write down any acrostics or acronyms that you know. Share them with your group.



# Check Your Textbook Reading Skills

Name \_\_\_\_\_

Date \_\_\_\_\_

As you read each of the following statements, mark your response using this key:

- 1 I seldom or never do this.
- 2 I occasionally do this, depending on the class.
- 3 I almost always or always do this.

- \_\_\_\_\_ 1. Before I read the chapter, I quickly skim through it to get main ideas.
- \_\_\_\_\_ 2. As I skim through the chapter, I form questions based on the bold printed section headings.
- \_\_\_\_\_ 3. I read with a positive attitude and look for something interesting.
- \_\_\_\_\_ 4. I read the introductory and summary paragraphs in the chapter before I begin reading.
- \_\_\_\_\_ 5. As I read each paragraph, I look for the main idea.
- \_\_\_\_\_ 6. I recite the main idea so I can remember it.
- \_\_\_\_\_ 7. I underline, highlight, or take notes on the main ideas.
- \_\_\_\_\_ 8. I write notes or outlines in the margin of the text.
- \_\_\_\_\_ 9. After reading each section, I do a quick review.
- \_\_\_\_\_ 10. I quickly review the chapter immediately after reading it.
- \_\_\_\_\_ 11. During or after reading, I reflect on how the material is useful or meaningful to me.
- \_\_\_\_\_ 12. I read or at least skim the assigned chapter before I come to class.
- \_\_\_\_\_ 13. I have planned reading time in my weekly schedule.
- \_\_\_\_\_ 14. I generally think positively about my reading assignments.
- \_\_\_\_\_ **Total points**

Check your score.

- 42–36 You have excellent college reading skills.
- 35–30 You have good skills, but can improve.
- 29–24 Some changes are needed.
- 23–14 Major changes are needed.

# Becoming an Efficient College Reader

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Based on your responses to the reading skills checklist on the previous page, list some of your good reading habits.
2. Based on this same checklist, what are some areas you need to improve?
3. Review the material on SQ4R and reading for speed and comprehension. Write five intention statements about how you plan to improve your reading. I intend to . . .
4. Review the material on how to concentrate while reading. List some ideas that you can use.

# Surveying and Questioning a Chapter

Name \_\_\_\_\_

Date \_\_\_\_\_

Using the *next chapter* assigned in this class or any other class, answer these questions. Again, challenge yourself to do this activity quickly. Can you finish the exercise in five to seven minutes? Notice your beginning and end times.

1. What is the title of the chapter? Write the title in the form of a question. For example, the title of this chapter is "Improving Memory and Reading." A good question would be, "How can I improve my memory and reading?"
2. Briefly list one key idea mentioned in the introduction or first paragraph.
3. Write five questions you asked yourself while surveying this chapter. Read the bold section headings in the chapter and turn them into questions. For example, one heading in this chapter is "Myths about Reading." This heading might prompt you to ask, "What are some myths about reading? Do I believe in some of these myths?"
4. List three topics that interest you.

5. Briefly write one key idea from the last paragraph or chapter summary.

6. How long did it take you to do this exercise? Write your time here.

7. What did you think of this exercise on surveying and questioning a chapter?