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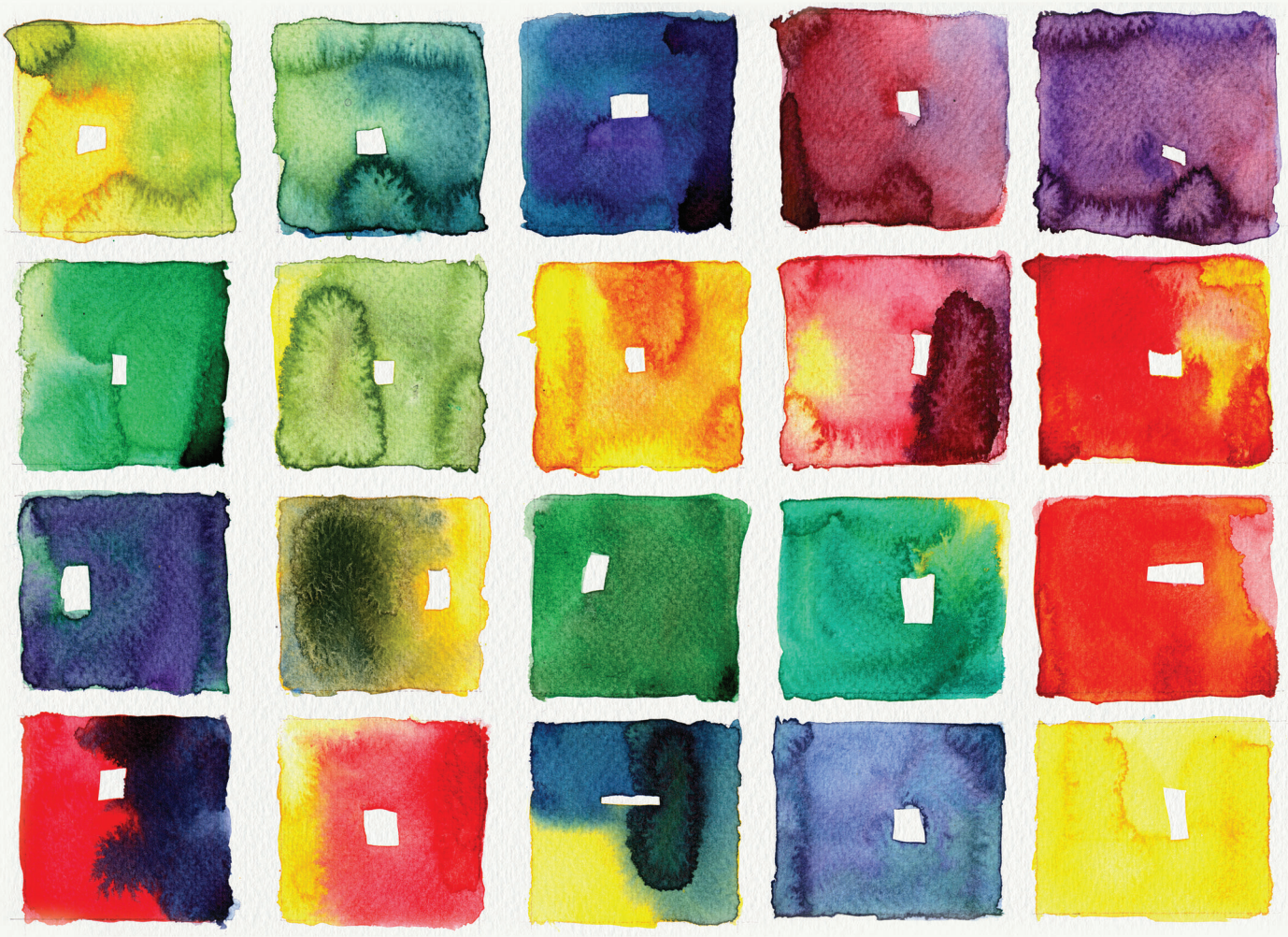

READING STRATEGIES

for college and beyond

DEBORAH J. KELLNER

READING STRATEGIES

FOR COLLEGE AND BEYOND

Second Edition

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Contents

A Note to the Student

Reading complex academic textbooks can be challenging for anybody. It can sometimes be hard to understand how to read even a page, because the colors, font changes, symbols, and boxes can make reading totally confusing. This textbook helps you understand when, how, and why it is important to pay attention to the visual clues given. The strategies included in this textbook are meant to aid in the comprehension of complex text by breaking it down into a more manageable format. These strategies help you stay engaged in the reading and guide you through the difficult material.

The exercises within this text help you to do the following:

- Lay the groundwork for your courses by helping you get organized with the course content and expectations in your courses by reading syllabi, using a calendar, and setting goals.
- Learn the layout of the texts by learning how to preview the textbooks.
- Learn the layout of the chapters by learning how to preview chapters.
- Use what you already know when you read by previewing; predict as you activate prior knowledge.
- Understand the value of questioning and ask what you want to know.
- Read actively by highlighting and annotating.
- Organize the information to make it easier to understand and remember.
- Use graphic organizers to clarify material and help retain information.
- Model what you know by teaching the content to someone else.
- Test yourself.
- Think about what works as you evaluate what strategies work best within certain disciplines.

You can use these strategies with ANY textbook! Each chapter or module in this book introduces a different strategy. You will find some sample textbook pages and articles at the end of each module in order to practice these strategies before you try them in your own textbook. As you complete these activities, you will discover that you not only understand the text better, but you also remember the content more easily as you prepare for tests. You are essentially improving your critical-reading, comprehension, and recall skills as you apply these strategies to any college textbook and any college course.

Good Advice from Other Students Who Have Used This Book

A combination of strategies works best.

After you are done reading, don't just put the book away—go review what you read.

Experiment with study habits.

If you turn the titles into questions, it gives you a purpose to read instead of rushing to get done.

It's easier to learn from general to specific, so skim through the chapter before you read it.

Keep asking yourself questions.

Practice with the strategies is necessary to master them.

Strategies keep you thinking about the text while reading.

The strategies work for a lot of textbooks.

Use whatever works for you.

Using the questions at the end of the book while you read is a good way to figure out what the main ideas are.

When you are organized and know what to look for, it's much easier to read, understand, and study.

While studying, be comfortable, but not too comfortable.

Don't push off work until the very last minute, causing more stress that is not necessary.

When you take time and actually take notes throughout the text, you learn a lot throughout the chapter.

Reading the textbooks assigned to you is actually very useful and important.

College courses take a lot of time outside of class and if you want to do well, you need to have time-management skills to study and to stay focused.

The strategies make reading easier and they make it more interesting and understandable.

If you use the strategies with each chapter of your book, you will notice that the exam is really easy because you already will have reviewed using the strategies.

Getting an education and being successful means passing the classes, and passing the classes means being able to understand the material given. The strategies do help you understand the material!

Reading Strategy Goal-Setting Log

After you have practiced the strategy, fill in each box with the date. Make a specific goal for each strategy—how you intend to use the strategy, how it might help you, and what disciplines might it be for.

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 1: Immediate Recall	
	Module 2: General Reading Strategies and Focused Reading	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 3: Vocabulary Development	
	Module 4: Structure Glance	
	Module 5: HIT: Headings, Ideas, Terms	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 6: Highlighting and Annotation	
	Module 7: The Q and SQ3R	
	Module 8: Introduction/ Conclusion Breakdown	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 9: NTA: Note-Taking Analysis	
	Module 10: CPG: Charts, Pictures, Graphs	
	Module 11: Outlining	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 12: Concept Mapping	
	Module 13: Sidebar Summaries and Graphic Organizers	
	Module 14: Text-Web Connection	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 15: PowerPoint Slides	
	Module 16: Test Construction	
	Module 17: Summarizing	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 18: Strategy Application	
	Module 19: Metacognition and Personal Application	
	Module 20, part 1: Reader Process and You	

Date	**Strategy**	**Specific Goal** how you intend to use the strategy, how it might help you, what discipline might it be useful for
	Module 20, part 2: Creative Strategy	
	Creative Strategy	
	Creative Strategy	

Pre-Module Activities

This pre-module activity is a bit different than the other modules in this book. It is designed to introduce you to important things to think about for success in your college courses.

Introduction

The purpose of this module is to:

- learn about the college experience,
- explore the syllabi,
- practice your planning skills,
- set goals,
- examine the texts that you will encounter, and
- reflect on your practices.

The Game: Transitioning to College

The following article is about the many differences between high school and college. It compares the two settings to the games of chess and checkers. Read "Checkers and Chess: What's in a Game? The Transition from High School to College," by David Johns, and find four ways that high school is different than college.

Checkers and Chess: What's in a Game?

The Transition from High School to College

David Johns

Checkers and Chess is an analogy for the "game" I have observed being played by first year students and their professors. My thesis is straightforward: students come from high school prepared to play a good game of checkers and their professors expect them to be playing a decent game of chess.

The reason for the misconception is in some ways obvious; both games are played on the same board. However, the pieces, the moves, and the rules are different. A professor makes a move and the students look on in disbelief. The students make a countermove and the look of disbelief is returned. The classic example of this mismatch of views comes with the first round of exams freshman year. The students exit their tests confident that they knew everything. They had studied with the methods that had proved successful in high school—they even surprised themselves by studying two days before the test instead of the usual night before. However, the look on their faces is shock when they get back their tests with failing grades because they missed the point (actually, they missed a lot of points). The professors are, in turn, swamped with complaints and often the first test is dropped if the students show improvement. Neither player fully understands that the other is not playing the same game, yet it is essential for the students to learn explicitly the distinctions between the two games.

The main distinctions between high school and college fall into four categories:

(a) The student body is different.
(b) The requirements are different.
(c) The classes are organized differently.
(d) The teachers are different.

First, the student body is different. Most college-bound students are coming from the top ranks of their high school classes. That means that in college, everybody is from the top of their high school class. Students can no longer evaluate themselves by comparison to poorer students; they must evaluate themselves by comparison to good students.

Second, the requirements are different. The requirements are harder: there are longer reading assignments; students have to go to lecture and read the text to understand the material; problems don't always have clear cut solutions; students have to write about ideas rather than feelings; tests demand detailed recall instead of recognition and may not have explicit objectives; there are fewer tests so larger segments of material must be remembered for longer periods of time.

In a survey of incoming freshman, we asked students about their confidence in being able to accomplish a variety of academic tasks. Students reported having confidence that they could produce good answers to assignments such as "For History 207, you have just read a chapter describing the events leading up to the Civil War. Make a diagram of the events which depict cause and effect relationships." They seem to feel that since they were admitted to college, they are capable of doing college work—and that they will be told explicitly how to go about performing new tasks.

But this is not the case, especially in a competitive school where students are expected to do more of the work on their own and are expected to do it faster. Students themselves do not

always possess adequate study skills or self-motivation; the survey reveals that many students reply "Often" to "I fall asleep when I'm reading or studying" and "Always" to "I am forced to study very much before a test or before an assignment is due." Often a student's initial reaction to academic frustration is a sense of inadequacy— "Maybe they made a mistake when they admitted me." Or the new demands may seem arbitrary, unreasonable, or mean—spirited because the purpose is not clear. The students have to learn new standards and expectations. They have to learn what is necessary for them personally to succeed in their chosen field.

Third, the class organization is different. The classes range in size from 40 to 400. There is less direct contact with the instructor to get information informally and fewer opportunities to show the teacher that you know something. The classes meet less frequently so the segments of material are larger. More of the work is done independently, and students are expected to make connections between class examples and out-of-class homework problems or readings. There are fewer reminders about tests and due dates for assignments, so students have to organize their own reminder system and orchestrate their own time.

Fourth, the teachers are different. Teachers in college have different responsibilities than high school teachers; students and teaching are not their only focus. Professors are therefore not as easily accessible; they have office hours and appointments.

The behavior of college teachers also differs from what students have come to expect. Professors are using a framework from their discipline to organize the information they present, and this is often not clear to the students. For example, in psychology, the professor is not Dr. Phil using a fifty minute session to talk about popular psychology and personal problems; he or she is using a formal scientific paradigm for the study of human behavior. Students may find classroom presentations boring or find the material incomprehensible because they cannot tune in or relate to the paradigm in use.

Students will need to retool their strategies (and learn some new ones) to meet new college requirements. For example, they will have to learn how to really read. They will no longer be able to get information just from lectures, from talking to other students, or from skimming books and guessing. They will need to learn systematic decoding strategies.

List the ways that high school is different than college according to the author:

1. _____

2. _____

3. _____

4. _____

Further explain each difference in your own words:

1. _____
2. _____
3. _____
4. _____

Even though the experience of college can be exciting for many, it can also be overwhelming at times and cause students to worry. This course and this text can help reduce some of the anxiety as you will be introduced to many tools and ideas that can help you be successful in academics. This book will prepare you for success in your courses. It will provide many strategies that you can practice, right here in the text, with reading assignments that you will be given in your other courses. As you learn and practice a variety of strategies, you will be encouraged to consider the ways the strategies can be applied to various disciplines. You will also be encouraged to choose the strategies that work best within a particular discipline. This book will teach you the rules to successfully "play the game" of reading for any discipline.

The Rules of the Game: The Course Syllabus

The Course Syllabus

In order to be successful in college, you must have focus, commitment, and persistence. You must know when and how to work hard, and when and how to ask for help. Success in school prepares you for success in life. College success requires a serious approach and you will need to consider that, for the moment, school is like your profession. If school were your profession, what would the expectations be? In other words, if this were your job, what behaviors would be expected of you? List them here:

_____
_____
_____
_____
_____
_____
_____

Identify three behaviors that would definitely get you fired at work:

1. _____
2. _____
3. _____

College is now your profession. How would these behaviors apply to college success?

_____
_____
_____
_____

The first step in establishing professionalism as a student is to know the rules of the game. The course syllabus that your course professors will give you in the beginning of the semester includes all the rules. It is up to you to read the syllabus and learn about the course organization and expectations. The syllabus will tell you everything you need to know about where and how to find your professor, what your assignments will be, when your tests will be given, and when papers are due. It is up to you to play the game by reading the syllabus even when the professor does not remind you to read it. Reading the syllabus will help you entirely map out your courses and keep track of due dates and exam dates.

Answer these questions using the syllabus from your **Reading course**.

Exploring READING Course Syllabus

1. What is the title of the class?
2. Who is the professor?
3. How do you contact the professor?
4. What are your professor's office hours?
5. Where is your professor's mailbox located?
6. What is (are) the name(s) of the textbook(s) used in the class?
7. What is the purpose of this class?
8. What do you need to purchase for the class?
9. What is the attendance policy?
10. How are the grades broken down—is it by percentages, or do you earn points, or????
11. What is the professor's policy on late work?
12. What is the professor's policy on late arrivals?
13. When is your first reading assignment due?
14. When is your first written assignment due?
15. When is your first quiz?
16. When is your first test?
17. Is there a midterm?
18. Is there a final?
19. What do you need to do to earn an "A" in the course?
20. What do you need to do to earn a "B" in the course?
21. Where can you go to receive assistance with class materials?
22. If you were the professor of this class, what would you want your students to know about the class that isn't covered by the above questions?

Answer these questions using the syllabus from another course (not your reading course).

Exploring ANOTHER Course Syllabus

1. What is the title of the class?
2. Who is the professor?
3. How do you contact the professor?
4. What are your professor's office hours?
5. Where is your professor's mailbox located?
6. What is (are) the name(s) of the textbook(s) used in the class?
7. What is the purpose of this class?
8. What do you need to purchase for the class?
9. What is the attendance policy?

10. How are the grades broken down—is it by percentages, or do you earn points, or????
11. What is the professor's policy on late work?
12. What is the professor's policy on late arrivals?
13. When is your first reading assignment due?
14. When is your first written assignment due?
15. When is your first quiz?
16. When is your first test?
17. Is there a midterm?
18. Is there a final?
19. What do you need to do to earn an "A" in the course?
20. What do you need to do to earn a "B" in the course?
21. Where can you go to receive assistance with class materials?
22. If you were the professor of your declared class, what would you want your students to know about the class that isn't covered by the above questions?

Preparing to Play the Game: The Course Calendar and Setting Goals

One important part to playing a game is to be focused and organized until the end. In order to win the game, you need to set some goals. Your goals help you remain focused and committed to your success. With some simple planning for college success, you will be able keep track of your professors' expectations. After you have thoroughly read your courses' syllabi, use a traditional calendar, a planner, or a cell phone calendar to log when papers are due, when exams will be held, and anything else specified. Make note of due dates for ALL of your classes. It is a good idea to print all of the syllabi and refer to them periodically throughout the semester to be sure you have included everything on your calendar. You can also refer to them when making study plans.

The Course Calendar

Fill in your planner/calendar now. Once you have finished filling out your planner/calendar, reflect on all there is to do by thinking about setting some goals.

Setting Goals

First, set some goals as you consider all there is to do. Your goals should be concrete and specific, not general and vague.

For example,

A general, vague goal is to say I want to lose weight;
a concrete, specific goal is to say I want to lose ten pounds.

A general, vague goal is to say I want to buy a car;
a concrete, specific goal is to say I want to save $2000 in six months to buy a car.

A general, vague goal is to say I want to get good grades;
a concrete, specific goal is to say I want to get all A's and B's this semester.

When a goal is concrete and specific, it is measurable. You can measure how much weight you lose; you can measure whether or not you have $2000 to buy your car in six months; and you can measure your grades as they come in.

In order to achieve your concrete, specific goals, you will need to ask and answer certain questions of what, who, where, why, when, and how. What is the goal? Who is involved in my goal? Where am I going to do it? Why am I going to do it? When am I going to do it? How am I going to do it? When you can answer these questions, it shows that you have put some thought into how to make your goal happen.

For example,

What is the goal? I want to lose ten pounds.

Who is involved in my goal? I am in control of this goal.

Where am I going to do it? When I am at home, I am not going to eat any breads or sweets. When I am at the store, I am not going to buy breads or sweets. When I am out to eat, I am going to order things without bread. I am definitely not ordering dessert.

Why am I going to do it? I want to be able to fit into my jeans from last year.

When am I going to do it? Breakfast, lunch, dinner, and any other time throughout the day.

How am I going to do it? I am going to ask my family and friends to help support me by not offering any breads or sweets. I am going to put my goal on an index card on my refrigerator so that I can see it every day before opening the refrigerator.

Make three concrete, specific goals about academics:

1. _____
2. _____
3. _____

Reflect on your three goals by asking and answering the questions what, who, where, why, when, and how. What is the goal? Who is involved in my goal? Where am I going to do it? Why am I going to do it? When am I going to do it? How am I going to do it?

Now that you have completed your course calendar planning and your goal setting, write a pep talk for yourself. Be your own cheerleader or coach and tell yourself what you need to hear to make all of this happen. Think about your academic past and be honest and direct with yourself.

Playing the Game: Understanding the Texts

College Texts versus High School Texts

There are a few things that make college textbooks different than high school textbooks. First, they are definitely larger, heavier, and more expensive. This may be the first text that you have ever actually paid for and own. For the last thirteen years of schooling, you may have been told not to write in your book because it was owned by the school, to be used over and over again by different students. Now, for the first time, you own your own text and can do whatever you want with it. You may be faced with having to stand in a long bookstore line to purchase it. You may pay more than you would like for it. Once you get it home, you may choose to shove it under your bed, only to open it when absolutely necessary. Or instead, you may choose to use the book the way it was intended and actually read it. Second, college textbooks are different than high school textbooks in the text itself. It is most likely denser, the chapters are most likely longer with more material covered, and the topics presented may be completely foreign to you. Third, college textbooks are most likely filled with a myriad of unfamiliar terms that you must learn and understand if you are going to comprehend the chapter.

In addition, besides textbooks, there are many other things you will be asked to read in college. You may be asked to read lab reports, popular press articles in newspapers and magazines, academic journals, experimental research, empirical research, case studies, novels, short stories, and websites that contain digital text and digital media. Regardless of what you are asked to read, there are many strategies you can use that will help you stay active and motivated even when the material is hard to understand and connect with. This book will help you learn how to read and to deal with issues related to reading. This book will help make the reading assignments less daunting and more manageable as you practice each strategy with the class and then again on your own with another text. This book promises to engage you in the text, regardless of the format or discipline, so that you can remain focused and committed to be successful. This book offers help when help is needed.

Some things you should know about college textbooks is that they are all different yet the same. Every textbook is different in the way it is arranged; but each textbook, regardless of the discipline, follows its own pattern—the pattern is repeated over and over again with each new chapter. For example, a math textbook chapter may start with a concept or process that is followed by three example problems, and then practice problems for you to solve. This pattern is repeated over and over with each section within the chapter introducing a new concept or process. Then, the end

of the chapter may have a list of all the concepts or processes covered followed by a practice test. A psychology textbook chapter may start with a specific scenario and possibly a picture about a human behavior and then each section within that chapter breaks down the behavior and introduces terms related to the behavior. The end of the chapter may have questions to answer and a list of vocabulary terms with their correlating pages for reference. Whether it is a math textbook, a psychology textbook, or some other discipline, the chapters within each textbook will all follow the same pattern. Yet a different math textbook, a different psychology textbook, or a different textbook from another discipline will follow a different pattern.

See if you can find the pattern of your textbook and compare it with the pattern of another textbook. Use the textbook preview below to help you find the patterns within textbooks.

Playing the Game: Previewing the Texts

Previewing the Texts

The textbook preview will help you get a sense of how content is presented, the structure the authors use to present information, and what kind of review/study aids are built into the text. Preview your textbook from another course by looking at its features and thinking about the purpose of each feature. If you do not have another course or another textbook, the library may have textbooks on loan for you to use.

There are two main sections of this table:

[1] the features of the textbook in general and

[2] the features of each chapter.

Title of textbook: _____

Does your TEXTBOOK have this feature?	**TEXTBOOK Feature Yes or no**	**Does your CHAPTER have this feature?**	**CHAPTER Feature Yes or no**
Author Information		Preview	
Preface		Questions	
Table of Contents		Photographs	
Chapter Notes		Charts	
Introduction		Key Words	
Preview		Chapter Glossary	
Appendix (or appendices)		Diagrams	
Glossary		Summary	
References		Links to other sources	

Subject Index		Practice test questions	
Name Index			
Credits			

In general, which parts of **the textbook** will be most useful to you? Why?

In general, which parts of **the chapter** will be most useful to you? Why?

Textbook Preview Reflection

Write a 200-word analysis (minimum) of your textbook from another course. Consider the following in your reflection:

How is this book similar to others you have used?
How does this book differ from others you have used?
In general, how are the chapters laid out? (Hint: Each chapter is laid out in the same way in a textbook but every textbook differs in the way the chapter is laid out.)
Describe chapter length. Describe other specific elements that are included.
Which parts of the chapter will be helpful to you? Explain.
Which parts of the chapter will be difficult for you? Explain.
What is your overall reaction to working with this text?
Identify your goals for using this text and how you intend to complete those goals.
This is an example of a textbook preview reflection written by a student:

> *My history book is a lot like other history books I have used because it has chapters, pictures, and maps. It also has some familiar topics with columns of information. It is different from other books I have used by the way it is broken up. My teacher said it is a portion of a history series. The book does not start with chapter 1 but instead starts with chapter 15 and goes to chapter 25. I do not know why. I wonder why the first 14 chapters are not included in this book. I do not understand what my teacher meant by being a part of a history series. Chapters 15–25 are very long, ranging from forty to fifty pages each. I think that the most helpful feature will be the chapter questions in the beginning of the chapter as well as the chapter review questions at the end of the chapter. I think the hardest part of this book will be reading it—it looks long and boring. I am not going to like it very much. One goal that might help is to read the chapter questions and try to answer them as I go along. At least, I can look for the answers and read those parts carefully. I can also read the pictures and maps carefully.*

Playing the Game: Reflecting on Reading

General Reading Strategies Reflection

Reflect on your personal general reading strategies for informational texts/textbooks. Write a 200-word analysis (minimum) of your past habits with academic reading. Consider the following in your reflection:

Where and when do you usually read your textbooks?
What particular reading strategies do you currently use?
What has worked well for you?
What are your strengths as a reader?
What are your weaknesses as a reader?
What difficulties have you encountered?
What particular distractions make it difficult for you to stay on task when reading?
What would you like help with?

Be Specific and Honest

Playing the Game: Reflecting on a Course

Course Reflection

Write a 200-word analysis (minimum) of another course you are currently enrolled in. Consider the following in your reflection:

1. How many students are in your class?
2. How often and where does your class meet? Lab, lecture hall, classroom, describe size of room, etc.
3. What teaching style does your professor seem to use? Lecture, small group activity, etc.
4. What aids does your professor offer to help you prepare for tests?
5. What types of assignments are given? What is the grading policy? Attendance policy?
6. What is your plan of action?

Module 1
Immediate Recall

Introduction

Reading textbooks does not have to be a long, boring activity. But in order to make it more interesting, you need to have a goal in mind as to how you will proceed. This strategy is quick and easy. The goal of this module is to practice your concentration as you read, and to practice remembering the information immediately without looking back at the text. The focus here is on general understanding of the text, not memorizing the details in the text. After you have read for a determined amount of time, you will be asked to close the book and write as much as you can remember about what you just read. This is why the task is called **immediate recall**—you will be asked to immediately recall what you have just read by writing about it. You will then share what you wrote with the class. So, the goal is to stay focused and remember what you are reading.

> Developing expertise in reading requires concentration and active thinking.

Basically, you will be required to:

- Read
- Concentrate
- Remember
- Write

Step-by-Step Strategy Description:

You will need a text, a timer, paper, pen/pencil, **and** your complete concentration.

> Using a strategy when you read will give you authority over all of your learning.

1. Decide on the material to be read.
2. Preview the pages to be read.
3. Set a timer for five minutes.
4. Read with complete concentration for five minutes. Focus on **general ideas** (not the details).
5. Close the book.
6. Write in paragraph format what you remember.

You will practice this several times at different sittings. When you believe that you have mastered your concentration, comprehension, and memory recall for 5 minutes, stretch your time to 10 minutes, then 15 minutes, then 20 minutes. The more you practice reading, the better reader you will become.

Before we practice immediate recall, think about your consciousness and your ability to concentrate. When reading academic texts, most students have difficulty with concentration and are easily distracted. Identify all your distractions. Think about all the interruptions and all the times your concentration breaks down. Make a list of all the factors that prevent you from getting the most out of a reading assignment. What is distracting you from the reading?

Factors

I can't concentrate because:

Now review your list and label.

Categorize your distractions as either: **Environmental, Physical, or Psychological.** Label each distraction with an E for Environment, a PHY for Physical, or a PSY for Psychological. Is there a pattern for you? Which category seems to contribute to your breakdown of concentration? Think about ways you can address this breakdown and make a list of solutions to your distractions below:

Practice

Practice immediate recall below with the sample textbook chapter included in this module. This particular sample chapter is from a psychology textbook. It is from a chapter on consciousness and attention. The chapter begins with an image about the topic. This is typical of most psychology textbooks as the author attempts to build your interest. Consciousness is a useful topic to think about in terms of reading. When you read, you have to pay attention to the text and tune out all other thoughts and distractions in order to comprehend the reading. If you are not paying close attention, you will soon get to the bottom of the page and realize that you have no idea what you just read. You then have to reread the entire page again. This is called regression—going back and rereading what you already read because you were not consciously thinking about what you were reading about. Obviously, people who regress numerous times take a lot more time to finish a reading than a person who does not regress. The more times you regress, the longer it will take to finish a reading. Regression can also impact your comprehension and your ability to recall the information you just read. If you want to avoid regression during reading, it is important to pay attention and be conscious of when your thinking starts to wander.

SAMPLE READING

The Nature of consciousness

Drew Westen

Figure 1.1

Almost a century ago, a Swiss psychologist named Claparede shook hands with a patient suffering from Korsakoff's disorder, which produces amnesia for recent events. Claparede had concealed a pin between his fingers, which pricked the patient as their hands clasped. At their next meeting, the patient had no memory of having met Claparede, but she found herself inexplicably unwilling to shake his hand (Coley, 1991). What the patient knew (that the good doctor was not so good) and what she knew *consciously* (that she was meeting a doctor, whom she need not fear) were two very different things.

Amnesiacs are not the only people who can respond to a stimulus at different levels of consciousness. As we shall see, we all do, but the signs are often more subtle. We begin this chapter by discussing the nature and functions of consciousness, examining the way attention focuses consciousness at any given time on a narrow subset of the thoughts and feelings of which a person could be aware. We then examine multiple perspectives on consciousness and explore the neural basis of consciousness. The remainder of the chapter is devoted to **states of consciousness**—qualitatively different patterns of subjective experience, including ways of experiencing both internal and external events. We start with the most basic distinction, between waking and sleeping, exploring the stages of sleep and the nature of dreaming. We conclude by examining several altered states of consciousness—deviations from the normal waking state—including meditation, religious experiences, hypnosis, and drug-induced states.

The Nature of Consciousness

Consciousness, the subjective awareness of mental events, may be easier to describe than to define. William James (1890) viewed consciousness as a constantly moving stream or thoughts, feelings, and perceptions. Shutting off consciousness in this sense is probably impossible, as anyone knows who has ever tried to "stop thinking" to escape insomnia. Following in the footsteps of the French philosopher Rene Descartes, who offered the famous proposition *"cogito ergo sum"* (I think, therefore I am), James also emphasized a second aspect of consciousness, the consciousness of self. James argued that part of being conscious of any particular thought is a simultaneous awareness of oneself as the author or owner of it.

Functions of Consciousness

Why do people have consciousness at all? Two of its functions are readily apparent: Consciousness monitors the self and the environment and controls thought and behavior (Kihlstrom, 1987). *Consciousness as a monitor* is analogous to a continuously moving video camera, surveying potentially significant perceptions, thoughts, emotions, goals, and problem-solving strategies. The *control function of consciousness* allows people to initiate and terminate thought and behavior in order to attain goals. People often rehearse scenarios in their minds, such as asking for a raise or confronting a disloyal friend. Consciousness is frequently engaged when people choose between competing strategies for solving a problem (Mandler & Nakamura, 1987).

These two functions of consciousness—monitoring and controlling—are intertwined, since consciousness monitors inner and outer experience in order to prevent and solve problems. For example, consciousness often "steps in" when automatized processes (procedural knowledge) are not successful. In this sense, consciousness is like the inspector in a garment factory: It does not make the product, but it checks to make sure the product is made correctly. If it finds an imperfection, it institutes a remedy (Gilbert, 1989, p. 206). In typing this sentence,

for example, I paid no conscious attention to the keys on my terminal, but when I made a mistake—hitting an "m" instead of a comma, the adjacent key—I looked at the keys and corrected the error.

From an evolutionary standpoint, consciousness probably evolved as a mechanism for directing behavior in adaptive ways that was superimposed on more primitive psychological processes such as conditioning (Reber, 1992). Indeed, William James was heavily influenced by Darwin, and he explained consciousness in terms of its function: fostering adaptation. Consciousness is often "grabbed" by things that are unexpected, unusual, or contrary to expectations—precisely the things that could affect well-being or survival. Much of the time people respond automatically to the environment, learning and processing information without conscious awareness. Important choices, however, require more consideration, and consciousness permits heightened reflection on significant events and the likely consequences of alternative choices.

Interim summary: Consciousness refers to the subjective awareness of mental events. States of consciousness are qualitatively different patterns of subjective experience, including ways of experiencing both internal and external events. Consciousness plays at least two functions: monitoring the self and the environment and controlling thought and behavior. Consciousness probably evolved as a mechanism for directing behavior in adaptive ways that was superimposed on more primitive psychological processes that today continue outside awareness.

Consciousness and Attention

At any given time, people are dimly aware of much more than what is conscious. For example, while reading the newspaper a person may have some vague awareness of the radiator clanking, voices in the next room, and the smell of breakfast cooking, although none of these is at the center of awareness or consciousness. At some point, however, certain olfactory sensations may unconsciously be given enough perceptual meaning (smoke or danger) to shift attention. Paradoxically, the monitoring and controlling functions of consciousness are thus to a considerable degree regulated *outside* of consciousness, by unconscious or implicit attentional mechanisms that focus conscious awareness.

Attention

Attention refers to the process of focusing conscious awareness, providing heightened sensitivity to a limited range of experience requiring more expensive information processing. *Selection—of* a particular object, a train of thought, or a location in space at which something important might be happening—is the essence of attention (Rees et al., 1997). Attention is generally guided by some combination of external stimulation—which naturally leads us to focus on relevant sensory information—and activated goals—which lead us to attend to thoughts, feelings, or stimuli relevant to obtaining them.

Filtering In and Filtering Out

Some psychologists have likened attention to a filtering process through which only more important information passes (Broadbent, 1958). For example, people frequently become so

engrossed in conversation with one person that they tune out all the other conversations in the room—an important skill at a loud party. However, if they hear someone mention their name across the room, they may suddenly look up and focus attention on the person who has just spoken the magic word. This phenomenon, called the *cocktail party phenomenon* (Cherry, 1953), suggests that we implicitly process much more information than reaches consciousness.

On the other hand, people also sometimes divert attention from information that may be relevant but emotionally upsetting, a process called selective inattention. This can be highly adaptive, as when students divert their attention from the anxiety of taking a test to the task itself. It can also be maladaptive, as when people ignore something as small as a darkening birthmark on the arm or as global as nuclear proliferation and hence fail to devote adequate cognitive resources to them (Lifton, 1980).

Components of Attention

Attention actually consists of at least three functions: *orienting to* sensory stimuli, *controlling the contents* of consciousness and voluntary behavior, *and maintaining alertness* (see Posner, 1995). Different neural networks (using different neurotransmitter systems) appear to be involved in these three functions (Robbins, 1997). Orienting, which has been studied most extensively in the visual system (Rafal & Robertson, 1995), involves turning sensory organs such as the eyes and ears toward a stimulus. It also involves spreading extra activation to the parts of the cortex that are processing information about the stimulus and probably inhibiting activation of others. When we attend to a stimulus, such as a mosquito buzzing around the room, the brain uses the same circuits it normally uses to process information that is not the focus of attention. For example, watching the mosquito leads to activation of the "what" and "where" visual pathways in the occipital, temporal, and parietal lobes. Attention enhances processing at those cortical locations as soon as a person (or monkey) has been signaled to watch or listen for particular stimuli or stimuli in a specific location. Recent PET data suggest that attentional mechanisms may generally increase the activation of a particular region of the brain when a person or monkey is signaled to watch for a stimulus; attentional mechanisms may also spread extra activation to objects once detected so they can be examined more carefully (Rees et al., 1997).

Controlling the contents of consciousness (such as deciding how much to listen to something someone is saying) and controlling voluntary behavior involve different neural pathways than orienting to stimuli. These "executive" control functions typically involve areas of the frontal lobes and basal ganglia, which are known to be involved in thought, movement, and self-control. In contrast, orienting to stimuli tends to require the involvement of neural circuits in the midbrain (such as the superior colliculus, which helps control eye movements), thalamus (which directs attention to particular sensory systems), and parietal lobes (which, among other functions, direct attention to particular locations).

Maintaining alertness is crucial in tasks ranging from paying attention to items on a test—and ignoring distractions such as anxiety or the sounds of traffic outside—to staying alert enough to notice a small change while keeping an eye on a radar screen for hours. A whole network of neurons from the reticular formation (which is involved in regulating states of alertness) through the frontal lobes appear to regulate alertness (Posner, 1995).

Divided Attention

Everyone has had the experience of trying to pay attention to too many things at once—and consequently not understanding or competently performing any of them. Psychologists have tried to determine the extent to which people can split attention between two complex tasks, such as following two conversations simultaneously; this is known as divided attention (see Craik et al., 1996). One way researchers study divided attention is through dichotic listening tasks … Subjects are fitted with earphones, and different information is directed into each ear simultaneously. They are instructed to attend only to the information from one ear by repeating aloud what they hear in that ear for a period of time, a process called *shadowing*. Attending to one channel or the other is difficult at first; it is easier if the two channels differ in topic, voice pitch, and so forth (Hirst, 1986).

Subjects can become so adept at shadowing that they are completely unable to recognize information in the unattended channel, performing no better than chance when asked whether a word presented in the unattended channel had been presented. Nevertheless, the information does appear to be processed to some degree, much as the smell of smoke is processed while reading a newspaper. This has been clearly demonstrated in research on priming […], the process by which exposure to a stimulus (such as a word) affects performance on tasks involving related stimuli (Nisbett & Wilson, 1977; Schacter, 1992). For example, a subject who hears "England" in the unattended channel may have no recollection of having heard the name of any country. When compared to a control subject who has not been similarly primed, however, the individual is more likely to say "London" if asked to name a capital city, and he will more quickly fill in the missing letters when asked for the name of a city when presented with LO_ _ _ N.

The data from many dichotic listening studies of divided attention actually suggest that subjects may not be dividing their attention at all: Failing to show recognition memory for the prime suggests that participants never consciously attended to it. In other cases, however, people do appear to divide their attention, performing two complex tasks simultaneously. Listening to a lecture while taking notes requires a student to hear and process one idea while simultaneously writing, and even paraphrasing, a previous idea or sentence. This is remarkable because both tasks are verbal and the content of each is highly similar; hence, one would expect heavy interference between the two. Psychologists have even trained subjects to take dictation while reading (Spelke et al., 1976).

Sometimes people accomplish such feats by rapidly shifting attention back and forth between the two tasks. Much of the time, however, people solve attentional dilemmas by automatizing one task or the other […]. Automatization develops through practice, as actions previously performed with deliberate conscious effort are eventually processed automatically. While students listen to a lecture, their primary focus of consciousness is on the lecturer's current words, while a largely automatic process, perhaps drawing on some subset of attentional processes, allows note taking. Precisely how much consciousness is involved in divided attention is not well understood. Students can generally recount what they have just written even while listening to a lecture, suggesting *some* involvement of conscious attention, although their primary allocation of attentional resources is to the lecturer.

Immediate Recall: 5-minute practice

Write in paragraph format what you remember:

Immediate Recall: 10-minute practice

Write in paragraph format what you remember:

Immediate Recall: 10-minute practice again

Write in paragraph format what you remember:

Your Text Choice

Now practice immediate recall with another content textbook. Identify which chapter and which text you will read. Log how much time you read.

Text Name: **Chapter Name:**

Time:

Immediate Recall Reflection

After you have practiced the strategy at least three times, reflect on how this strategy worked for you by writing about it. Use the questions below as a guide.

Active thinking and complete concentration is necessary for recalling information after reading. Immediate recall is a reading strategy to check attention, comprehension, and recall. The recall and writing portion happens after you have read; thus, it is an "after the reading" strategy.

1. Write in paragraph format what you thought of this strategy.
2. What did you learn about yourself as a reader?
3. What did you learn about your ability to concentrate?
4. Was this an effective strategy for you? Why or why not?
5. How will you use this strategy again?
6. What modifications, if any, will you make?
7. What disciplines might this strategy work with? Math? History? Biology? Anatomy? Explain your reasoning.

Module 2
General Reading Strategies and Focused Reading

Introduction

The purpose of this module is to encourage you to focus while you read. In Module 1, you practiced your concentration while you read. This module builds on that premise while it introduces a strategy that you most likely have used many times before. It encourages you to have a purpose in mind before you begin reading. With a purpose, your reading will be more focused and effective. It is called focused reading because it helps you stay focused as you read. For any type of reading, it is useful to know what you are looking for before you begin reading. For example, if you are looking up someone's phone number in your phone, you begin to scroll alphabetically for their name because you know it will lead to finding their phone number. In much the same way, if you are looking for answers to particular questions in your textbook, you can scan the text to determine where to read it more closely. Once you have found the answer, you read it for understanding to be sure you have found what you are looking for. In this module, you will look for answers to particular questions to help you stay focused. There are also some general reading strategies that you should think about and use.

Establishing reading routines will provide reassurance, which leads to success.

General Reading Strategies: About Focus

(1) Time, Place, and Perspective

Different students read more effectively at different times and in different circumstances. It is a good idea to start keeping track of how you study and learn best. With that in mind, these are some general suggestions that work for many students:

A. **Be an active reader.** Read with a pencil in hand, focus on connecting the information in the textbook with your professor's lectures with different things you have read, and with other things you know about the topic.
B. **Review what you read at different intervals.** Every page or so, stop and quickly tell yourself what that section is about. If you don't know or can't remember, refocus and reread.
C. **Get comfortable.** You can't concentrate if you are too hot or too cold, hungry, if there's not enough light, and so on.
D. **But don't get too comfortable.** If you are so comfortable that you fall asleep, you are defeating the purpose of studying. Textbook reading is still work—you need to approach with a purpose and a desire to get something out of it.
E. **Don't work where you are easily distracted.** Roommate, TV, music, cell phone, computer, and so on. If it helps to have music on to drown out other noises, then that's a good idea. But if you find yourself singing along, that solution has now become a distraction. The article below discusses multitasking more thoroughly.
F. **Find what works for you.** As you move through the course, note what works—and what does not work for you—while you read your textbook.
G. **Focus on your purpose.** Why are you reading that particular chapter? What do you need to accomplish? This should play a part in *how* you read it. Focused reading will help your concentration as you read with a purpose and organize your thoughts.

Focused reading provides a guide to help you apply the content of the chapter.

(2) An Article of Interest

An article from *The Chronicle* called "Welcome, Freshmen. Look at Me When I Talk to You" by Jonathan Zimmerman, gives some tips that all college students should know about multitasking and reading. Your ability to focus is related to your ability to multitask. Zimmerman states that "people learn and perform better when they focus on one thing at a time." Read this article. Highlight all of the places where he discusses multitasking and reading. Highlighting while you read helps you focus.

Welcome, Freshmen. Look at Me When I Talk to You.

Jonathan Zimmerman

Join student clubs. Go to your professor's office hours. If you're feeling down, talk with someone about it. And please, don't drink too much.

Welcome to the typical freshman orientation at an American college, where we hand out advice like candy (or, on some campuses, like condoms). But here's one piece of wisdom our newcomers don't hear nearly enough: Close your windows.

I'm talking about those distracting windows on your computer. A sizable body of research shows that people learn and perform much better when they focus on one thing at a time. Isn't that something every freshman should know?

Ditto for research about reading, which indicates that you retain more when you read in print than on a screen. As more and more course material goes online, we need to let our students in on that little secret.

For the most part, though, we don't. When it comes to all matters digital, there's a sense that the train has already left the station. We should all be on board, encouraging more engagement with these technologies rather than less.

That's abdication, not education. Surely digital technologies have great potential to enhance student learning. But they also present dangers, which we should explain when digital natives arrive on campus.

Start with multitasking, which is one of the great myths of contemporary life. Most of us believe that we can do several activities simultaneously with the same efficiency as if we did them one at a time.

But we're wrong. The late Stanford professor Clifford Nass spent his career testing multitaskers, who told him—over and over again—that they were good at it. His research showed the opposite: They're chronically distracted, which inhibits their performance in everything they do.

Indeed, Nass found, people who multitask infrequently are actually better at it than those who do it all the time. That's because multitasking shortens our attention span. Some psychologists have even suggested that it's "rewiring" our brains to prevent us from concentrating, especially on written texts that are longer than a tweet or an instant message.

There's also plenty of evidence that we read less carefully on screens than in print, even when we're not doing other things at the same time. Experiments with eye trackers, which follow your eyes while you read, have demonstrated that we tend to skim more on screens. Other researchers have shown that scrolling creates more distraction than flipping a page, which helps explain why most of us retain more from a printed text than from a digital one.

In class, people learn less when someone near them is surfing the web; the temptation to follow what's on the screen, rather than what's happening in the class, is simply too great. When I found that out, I banned laptops from my classroom. You can distract yourself, if you so choose, but you have no right to distract somebody else.

Even if you're not tooling around the internet, laptops can inhibit your learning. Students who take notes on computers often try to record every word instead of making the important cognitive judgments—Do I write this down or not?—that pen-and-paper note-taking requires. Some professors report that students are annoyed when they are asked questions because it interrupts their harried transcription of the class. That's not education; it's dictation.

Some frightening data suggests that habitual computer activity, especially on social media, hampers our social and emotional development, particularly our ability to empathize with others. Clifford Nass saw this firsthand while serving as a dorm adviser at Stanford, where he urged students to turn off their devices and converse directly with one another.

"We've got to make face-to-face time sacred," Nass told a Stanford audience in 2013, a few months before he died, "and we have to bring back the saying we used to hear all the time and now never hear: 'Look at me when I talk to you.' "

It's hard to know why our colleges have been so slow to share this information with our students. Part of the reason probably stems from America's obsession with progress, especially in technology, which assumes that the next big thing is always the best thing.

But there's also an element of cynical self-interest at work. Many of our institutions have invested heavily in online education, which promises to teach more and more people at a fraction of the cost. How can we warn about the limits of digital learning while we're simultaneously touting online courses and programs?

The answer is simple: Use what we know to help our students learn as much as they can. Tell them to turn off every program except the one they're using, so they minimize distractions. And provide free printers wherever possible, so students don't have to read everything on screens.

Most of all, tell them to get out more. In a 2009 survey, more than half of community-college students and a third of four-year students agreed with the statement, "I pretty much keep to myself socially." Many students prefer the anonymity of the internet to the messy work of face-to-face communication, with its unpredictable rhythms and awkward silences.

But that's all the more reason to urge them to take their eyes off their phones and laptops. Employers increasingly report that they want workers with "soft skills," like problem solving and getting along with others. Our students won't learn much of that by sitting in front of their screens.

And they won't learn nearly as much in college—from one another or from us—if they're living online. That's not an opinion; it's a fact. Hiding it from our students is worse than embarrassing, to our profession and ourselves. It's malpractice.

Reread your highlighted portions. List two ideas about multitasking in your own words:

1. _____
2. _____

List two ideas about reading in your own words:

1. _____
2. _____

Before you read this article, you were given a purpose to read. Your purpose was to highlight particular things in the reading. It gave you something specific to look for while you read in order to help you focus. This is what focused reading is all about. In addition, focused reading is enhanced when you know the structure of a reading. With longer readings or textbook chapters, it is helpful to preview the reading and understand the structure. This article's structure included the title of the piece followed by many short paragraphs. Understanding the structure helps you to know where to look for whatever it is you are looking for. In the "Pre-Module Activities" section of this book, you were first introduced to the idea of looking at structure when you previewed the features in a chapter. Now you will practice it more in depth in order to get more familiar with chapter structure. Remember that every chapter within a textbook is similar in structure; yet, every textbook uses a different structure. It is up to you to recognize and use the structure to help you focus.

(3) Chapter Textbook Analysis

Complete this by previewing a chapter in your textbook from another course and examining the structure. Use the chart to comment on the notable features. Plan how to read this chapter and consider how you feel about reading it now that you understand the structure.

Describe chapter structure: length, section length, notable features	Describe chapter beginning and end: Introduction? Conclusion? Other?	Describe section structure:	Describe special features within the chapter:	Describe study aids:

Strategic plan:
Overall reaction:

Focused Reading

This is a strategy that you can think of as a formalization of the minimum of concentrated effort one needs to do when reading a textbook chapter. Essentially, it involves identifying, before you begin reading: the purpose of reading the chapter, the ideas you are trying to find out, and the questions you want to answer. By doing this, you read for a purpose—to answer questions—instead of simply moving aimlessly through the text. Of course, there are many purposes for reading besides reading to answer questions. Some other purposes include reading to write a research paper, reading to fill in a study guide, or reading to learn all the new bolded terms. For this module, our purpose is to read to find the answers to questions.

Step-by-Step Strategy Description

1. Decide what you are trying to find out from the chapter before you begin reading. For example, things the professor has said to look for in the chapter, questions from the end of the chapter that you need to answer, or simply things that you are curious about or don't understand that should be explained in the chapter. What you are looking for may vary for each person and for each reading. If you don't know where else to start, begin by looking for questions at the end of the chapter. If there are questions, use those to help you focus. Sometimes there are no questions, or the questions are more in depth than the type of questions that you can find answers to directly in the reading. You will learn many other strategies that will help if you happen to have a reading with no questions. For now, use the questions that are there. You should also know that it is ok to try to come up with your own questions or items you want to find the answer to. You can start by writing the questions down on a piece of paper, in the margins of your textbook, or on a chart.
2. Begin reading the chapter after you have identified some questions you want to answer. As you come across the answer to your question (or an area that informs you about the question) highlight it, write the answer down, and note where in the text you found it.
3. After you finish the chapter, reread your questions again and try to answer them immediately and then again when you are reviewing for a test. You have essentially created a study guide to use so it is important to understand the answer. Do not copy directly from the text for the answer—try to put it in your own words so that you actually understand it and can meaningfully study from it. For any question you cannot answer, flip to the section you have noted and reread that section.

It may help to think about focused reading in terms of a chart. By making a chart like the sample that follows, you are also making a study guide.

Focused Questions:		**Answer to the question, and where in the reading you found information about your focused question: (page #, paragraph, etc.)**
Concept/Question 1:		
Concept/Question 2:		
Concept/Question 3:		

Practice

Practice focused reading below with the sample textbook chapter included in this module. This particular sample chapter is about the eye. It includes some typical features of a technical science-related reading: some text, an image, and some figures. When images and figures are included, they are there to help you understand the text because it is technical and specific. Be sure to read the images and the figures too, to help you understand the complex text. The sample chapter here also includes some bolded words that you would most likely need to know if you were to have a test. If this selection contained no questions at the end, you could use the bolded words, the image, and the figures in order to make up questions. But this selection does contain questions, so those will help you focus.

First, find and read the questions. Second, write them in the column on the chart labeled Focused Questions. Keep these questions in the back of your mind while you read the text. Third, read and highlight. When you get to something in the text that has to do with the question, highlight it. Fourth, once you have completed the reading, review your highlighting and fill in the answers on the chart OR fill in the answers as they come up, after you highlight. Also, make note of the page number in the text that answers the question. These page numbers will come in handy when you need to refer back to the text when studying for a test.

SAMPLE READING

The Eye

Drew Westen

From the cornea, light passes through a chamber of fluid called *aqueous humor,* which supplies oxygen and other nutrients to the cornea and lens. Unlike blood, which performs this function in other parts of the body, the aqueous humor is a clear fluid, so light can pass through it. Next, light travels through an opening in the center of the **iris** (the pigmented tissue that gives the eye its blue, green, or brown color); this opening is the pupil. Muscle fibers in the iris cause the pupil to expand (dilate) or constrict to regulate the amount of light entering the eye. The size of the pupil also changes with different psychological states, such as

Figure 2.1 The size of the pupils changes in different emotional states, which means that a skilled gambler may literally be able to read his opponents' hands from their eyes, although he may have no awareness of the mechanisms by which he can do this.

fear, excitement, interest, and sexual arousal. Experienced gamblers (and perhaps Don Juans) can use pupil size to read other people's emotions (Hess, 1965).

The next step in focusing light occurs in the **lens**, an elastic, disc-shaped structure about the size of a lima bean. Muscles attached to cells surrounding the lens alter its shape to focus on objects at various distances. The lens flattens for distant objects and becomes more rounded or spherical for closer objects, a process known as **accommodation**. The light is then projected through the *vitreous humor* (a clear, gelatinous liquid) onto the **retina**, a light-sensitive layer of tissue at the back of the eye. The retina receives a constant flow of images as people turn their heads and eyes or move through space.

Abnormalities in the eye sometimes make accommodation difficult, affecting **visual acuity**, or sharpness of the image. Since light waves normally spread out over a distance, the eye has to focus them on a single point in the retina to produce a clear image. **Nearsightedness** (or **myopia)** occurs when the cornea and lens focus this image in front of the retina; by the time

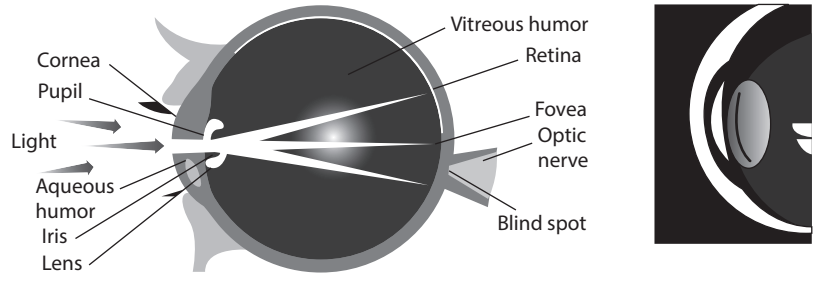

Figure 2.2 Anatomy of the human eye. The cornea, pupil, and lens focus a pattern of light onto the retina, which then transduces the retinal image into neural signals carried to the brain by the optic nerve.

rays of light reach the retina, they have begun to cross, leading to a blurred image (Figure 2.3). The opposite effect occurs in **farsightedness** (or **hyperopia)**: The eye focuses light on a point beyond the retina, leading to decreased acuity at close range. Both abnormalities are common at all ages and usually are readily corrected with lenses that alter the optics of the eye. With advancing age, however, losses in visual acuity become more pronounced (Curcio and Drucker, 1993; Fukada et al., 1990; Matjucha and Katz, 1994). The lens becomes more opaque and loses some of its ability to accommodate, and the diameter of the pupil shrinks so that less light reaches the retina. Cataracts, which are common in older people, occur when the lens becomes so cloudy that the person may become almost blind. As a result of age-related changes, the retina of a normal 65-year-old receives only about one-third as much light as that of a 20-year-old (Kline & Schieber, 1985).

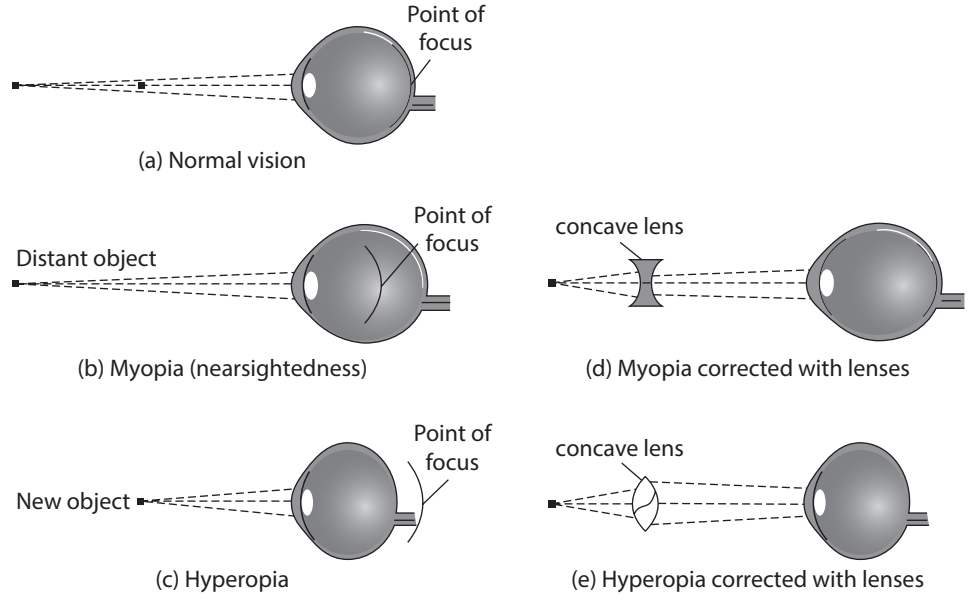

Figure 2.3 Normal vision (a), nearsightedness (b), and farsightedness (c). In (a), the cornea and lens focus the image on the retina, producing normal vision. The shape of the lens, of course, differs for optimal focus on objects nearby or at a distance. In (b), the image is focused in front of the retina (myopia), whereas in (c), it is focused behind the retina (hyperopia). In (d), a concave lens corrects vision by spreading out the light rays from distant objects. In (e), a convex lens has the opposite effect, bending light rays toward each other to focus them on the retina instead of behind it.

Questions

1. What is the function of the iris?
2. Why does the pupil constrict or dilate?
3. How large is the lens in someone's eye?
4. Why do the muscles of the lens cause it to change shape?
5. What is accommodation?
6. What is the function of the retina?
7. Describe visual acuity.
8. Another name for nearsightedness is _____.

9. What is farsightedness?
10. How do myopia and hyperopia differ?
11. How does one correct myopia or hyperopia?
12. What is a cataract?
13. At what age range are cataracts common?
14. How is the eye like a camera?
15. How do concave and convex lenses work?
16. True or false: The size of the pupil changes with varying emotions.

Focused Questions:		Use the sample reading to answer the questions, and identify where in the reading you found information about the focused question: (page #, paragraph, etc.)
Concept/Question 1:	*What is the function of the iris?*	
Concept/Question 2:	*Why does the pupil constrict or dilate?*	
Concept/Question 3:	*How large is the lens in someone's eye?*	
Concept/Question 4:	*Why do the muscles of the lens cause it to change shape?*	
Concept/Question 5:	*What is accommodation?*	
Concept/Question 6:	*What is the function of the retina?*	
Concept/Question 7:	*Describe visual acuity.*	

Concept/Question 8:	*Another name for nearsightedness is _____.*	
Concept/Question 9:	*What is farsightedness?*	
Concept/Question 10:	*How do myopia and hyperopia differ?*	
Concept/Question 11:	*How does one correct myopia or hyperopia?*	
Concept/Question 12:	*What is a cataract?*	
Concept/Question 13:	*At what age range are cataracts common?*	
Concept/Question 14:	*How is the eye like a camera?*	
Concept/Question 15:	*How do concave and convex lenses work?*	
Concept/Question 16:	*True or False: The size of the pupil changes with varying emotions.*	

Actively bring the content of the reading into the structures of your mind by asking questions. This is both a "pre-reading" activity and a "during the reading" activity.

Your Text Choice

Try focused reading on a chapter from another textbook. Identify the chapter number and the number of pages you will read before you begin—this helps you set a goal for reading before you actually begin to read. Knowing your task before you begin will help you understand what to expect and will also keep you interested and motivated to complete the task. Your task here is to read to find the answers to your questions.

Chapter: **Pages:**

Focused Questions:		**Answer to the question, and where in the reading you found information about your focused question: (page #, paragraph, etc.)**
Concept/Question 1:		
Concept/Question 2:		
Concept/Question 3:		
Concept/Question 4:		
Concept/Question 5:		

Concept/Question 6:		
Concept/Question 7:		
Concept/Question 8:		
Concept/Question 9:		
Concept/Question 10:		
Concept/Question 11:		
Concept/Question 12:		

Strategy Feedback Prompt

Learning to think about what works for you is important as you take command of your learning

This exercise is meant to be reflective in nature as you consider how you liked the strategy, how you might use it again, and why you might benefit from using it. After you have practiced applying the strategy, answer the following:

Module #

Module Name:

Describe how to use the strategy in detail:

Chapter title and number:

Outcome: Write a paragraph about your use of the strategy with your text choice. Comment on the following and add any other thoughts that you would like to share: Do you like this strategy? How well did the strategy work for your own text choice chapter? Did you have to change the method in which you did it in any way? How? What did you get out of this module? How will this strategy help you in the future?

Identify other disciplines that this strategy would work well with.

Mastery Assessment

You will need to assess your learning in order to discover your strengths and weaknesses.

The mastery assessment for this module involves focusing on questions and reading to find the answers. As you read, fill in the chart at the end of the reading. The sample reading from a science/health-related website has questions embedded in the text itself rather than at the end of the reading. Use the embedded questions to complete the chart.

SAMPLE READING

Insight into otitis media and treatments

Dr. Nancy Griner

What Is Otitis Media?

Otitis media means inflammation of the middle ear. The inflammation occurs as a result of a middle ear infection. It can occur in one or both ears. Otitis media is the most frequent diagnosis recorded for children who visit physicians for illness. It is also the most common cause of hearing loss in children.

Although otitis media is most common in young children, it also affects adults occasionally. It occurs most commonly in the winter and early spring months.

Is it serious?

Yes, it is serious because of the severe earache and hearing loss it can create. Hearing loss, especially in children, may impair learning capacity and even delay speech development. However, if it is treated promptly and effectively, hearing can almost always be restored to normal.

Otitis media is also serious because the infection can spread to nearby structures in the head, especially the mastoid. Thus, it is very important to recognize the symptoms (see list) of otitis media and to get immediate attention from your doctor.

How does the ear work?

The outer ear collects sounds. The middle ear is a pea sized, air-filled cavity separated from the outer ear by the paper-thin eardrum. Attached to the eardrum are three tiny ear bones. When sound waves strike the eardrum, it vibrates and sets the bones in motion that transmit to the inner ear. The inner ear converts vibrations to electrical signals and sends these signals to the brain. It also helps maintain balance.

A healthy middle ear contains air at the same atmospheric pressure as outside of the ear, allowing free vibration. Air enters the middle ear through the narrow Eustachian tube that connects the back of the nose to the ear. When you yawn and hear a pop, your Eustachian tube has just sent a tiny air bubble to your middle ear to equalize the air pressure.

What causes otitis media?

Blockage of the Eustachian tube during a cold, allergy, or upper respiratory infection and the presence of bacteria or viruses lead to the accumulation of fluid (a build-up of pus and mucus) behind the eardrum. This is the infection called acute otitis media. The build up of pressurized pus in the middle ear causes earache, swelling, and redness. Since the eardrum cannot vibrate properly, you or your child may have hearing problems.

Sometimes the eardrum ruptures, and pus drains out of the ear. But more commonly, the pus and mucus remain in the middle ear due to the swollen and inflamed Eustachian tube. This is called middle ear effusion or serous otitis media. Often after the acute infection has passed, the effusion remains and becomes chronic, lasting for weeks, months, or even years. This condition makes one subject to frequent recurrences of the acute infection and may cause difficulty in hearing.

What are the symptoms?

In infants and toddlers look for pulling or scratching at the ear, especially if accompanied by the following:

- Hearing problems
- Crying, irritability
- Fever
- Vomiting
- Ear drainage

In young children, adolescents, and adults look for:

- Earache
- Feeling of fullness or pressure
- Hearing problems
- Dizziness, loss of balance
- Nausea, vomiting
- Ear drainage
- Fever

Remember, without proper treatment, damage from an ear infection can cause chronic or permanent hearing loss.

http://drgriner.com/ears-ear-aches/

What goes here?	What goes here?
Concept/Question 1:	
Concept/Question 2:	
Concept/Question 3:	
Concept/Question 4:	
Concept/Question 5:	
Concept/Question 6: *How did the questions help you stay focused?*	

Image Credit

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Module 3
Vocabulary Development

Introduction

The purpose of this module is to emphasize the importance of vocabulary building for college success. There are many resources available to help you build a better vocabulary: books, dictionaries, audio recordings, videos, and websites. Despite all the available resources, there is no quick and easy way to increase your vocabulary. Research shows that reading a lot—of anything—will increase your general vocabulary level. Research also shows that the more you write, the better a writer you become. So, simply given the fact that you will be reading and writing more in college, your vocabulary will improve. Even so, there will be times that you will be faced with the task of learning many new terms. You will need to know these terms in order to understand the text and in order to use them correctly in writing assignments for your courses. In addition, your professor will most likely use these terms when teaching the course content. You will encounter these terms again on tests. So, the ultimate goal of this module is to suggest ways to learn the difficult vocabulary that you will encounter in your courses. It will take time, commitment, determination, motivation, and persistence to learn and remember new terms and build a better vocabulary.

Learning new terms is vital to understanding the content in a chapter.

General Vocabulary

You already know that most words have more than one meaning. For example, in this textbook, the term *discipline* refers to subjects like math, biology, English, psychology, and many others. In another context, discipline can mean self-control; like "You have to practice self-discipline to learn twenty new terms a day." Discipline can also mean a way to teach your children right from wrong; like "When the child refused to listen to the teacher, he was disciplined by having to stay after class." The meaning of the term *discipline* depends on the context. When learning general vocabulary, use the context to understand the meaning.

Discipline-Shared Vocabulary

Additionally, some terms are shared by many different content areas yet mean different things depending on the content or discipline. With these terms, it is important for you to know the meaning within that specific discipline. For example, you may have learned the meaning of terms in literature like plot, setting, tone, and characters. These terms are used when discussing elements of a story in English class. But these terms are used in different content areas and mean different things in other disciplines. In English class, the term *plot* refers to the series of events of a storyline; but in geography and agriculture, a plot refers to land. In English class, the term *setting* refers to the time and place of the story; but in music, the term *setting* refers to a piece of music composed a certain way. In English class, the term *tone* refers to the feelings and attitudes that the author intended to convey; whereas in music, it refers to sound—loud, soft, high pitch, low pitch, and so on. In math, the term *product* means the answer when multiplying; whereas in marketing a product is available to purchase or use in some way; while in biology, the term *product* refers to some kind of chemical substance.

The figure below includes familiar words that are also math terms. They are used in specific ways in math, but in very different ways in other contexts.

Confusing Terms

altitude
any
base
combination
compute and computer
congruent and equivalent
difference
divide *by* and divide *into*
dividend
equal and equivalent
example
extreme
factor
fact
imaginary
limit
mean and median
multiples
number and numeral
of and off
operation
or (exclusive) vs. or (inclusive)
origin
pi
power
prime
product
radical
range
reflection
regular
relationship
remainder (division) vs. remainder (subtraction)
right angle and left angle
similar
sine and sign
sum and some
tangent
variable

Confusing Formats

analog and digital clocks
angle rotation
quadrant layout
superscripts and subscripts
various types of graphs

Confusing Symbols

$\sqrt{}$ and $\sqrt{}$
•, ×, ( ), and *
÷, $\sqrt{}$, /, and $\frac{m}{n}$
=, ≡, ~, ≈, and ≅
< and >

Figure 3.1

The important thing here is to understand that some disciplines share the same word but the term has different meanings within a particular discipline. Each discipline has its own history and vocabulary. Learning the language of a specific discipline will help you learn that discipline. Some disciplines even share the same meaning of the word. When learning discipline-shared vocabulary, use the discipline to understand the meaning of the word.