NATURAL SCIENCE STUDENTS:

A guide on how to better comprehend what you read, how to read more and read faster and how to study more efficiently.

Written by (original 1985; revised August 3, 2016)

Scott M. Moody, Ph.D., Emeritus Professor of Biological Sciences,
Ohio University, Athens OH 45701    moody@ohio.edu
Office: Irvine 003     Mobile phone: 740-707-4280

PREFACE

This guide to studying was written primarily for students majoring in the various disciplines of biological science although these methods certainly apply to all academic areas. This is a guide to more and speedier reading and to more thorough comprehension of the information found in science textbooks. I also include hints on how to listen and take lecture notes, how to study for exams, how to prepare for lab exercises, how to manage more efficiently study time, how to keep physically and mentally healthy, etc.

In order to write this guide, I relied mostly on my own practical experiences as a former student and as a current (more than 40 years) college teacher and advisor of students. I have also taken speed-reading courses including the famed Evelyn Wood Reading Dynamics Course. In addition I have served as a consultant on how to teach problem-based biology to teachers in the school districts of southeastern Ohio. I served for three years as an evaluator of innovative teaching proposals for the Eisenhower Math and Science Grant Committee for the Ohio Board of Regents as well as having been a co-recipient of a grant.

A problem in the learning of biological science today at colleges and universities is that students graduate from the secondary schools without an understanding of the fundamental principles of biology: molecular and cellular structure and process, heredity and molecular genetics, development, physiology, ecology, and evolution by means of natural selection.

The style of science education in the elementary and secondary schools is one of teaching the above as isolated pieces of factual information. Unfortunately they are consumed like the items you order at "fast-food" restaurants instead of admired, understood, slowly consumed and digested as a coordinated seven-course meal at a formal "multi-star" restaurant.

In order for students to truly understand and apply knowledge in a problem-solving manner the principles of biology he or she must move from consumption of "empty calorie, processed" foods, the simple sugars and fats, to the "complex calorie, less processed" foods of natural grains, vegetables, fruits and nuts, meat and dairy.

The latter does require more time for ingestion and digestion; the same is true for process-based problem solving learning of biology. The understanding of principles can't be learned through rote memorization or cramming the night before an exam. Learning must be an active, not passive, process that has been repeated numerous times.

The goals of this study guide are: 1. the student will be able to recall the information, both data and ideas, more quickly and accurately; 2. the student will be able to grasp and understand the concepts, principles, models, hypotheses, and theories and their postulates; 3. the student will be able to apply this information in problem-solving situations found in lab exercises and on lecture examinations; and, 4. the student will maximize his or her potential to earn better grades on exams.
SPEED READING:  WHAT IS IT?  CAN IT WORK FOR ME?

Many people, including university science faculty involved in teaching and research, have misconceptions about "speed reading." Most people immediately reject the idea, stating that speed-reading is for newspapers, magazines and novels, not for scientific textbooks and publications. They mistakenly believe that with "hard" writings, that one must read every single word separately, slowly and linearly. This is a naïve view and a mistake.

Of course, speed reading of a novel will be different, and should be different, than the speed reading of a scientific article or anatomy or ecology book, but you can learn to read books on any scientific subject at a faster speed and comprehend more of the information.

Actually, speed-reading does not emphasize the velocity of words, phrases and sentences flying by your eyeballs or the rate of turning pages in a book. It is a series of integrated techniques that will improve your comprehension of the subject matter and your memorization and recall of the factual details. Isn't this what you need to perform well on exams?

These techniques will increase reading speed, make learning more efficient, create a more enjoyable learning environment, and allow more time to pursue other extracurricular activities. Who would object to these goals?

The visual or optic system of vertebrates is a remarkable adaptable, potentially capable of receiving a tremendous amount of information through the eyeball utilizing the mechanics of the lens and chemistry of the retina. The signals, which the optic nerve sends to the visual centers of the brain, are then interpreted and analyzed, but this center never operates at full capacity. There is no real limit to the amount of visual information the eyeball can receive and the brain can interpret. Just think about it.

You can drive down a busy highway, monitor moving vehicles traveling at different velocities and in different directions, read the road signs, pay attention to potholes and debris on the road surface, and carry on a conversation with occupants of the car (hopefully, not talking or texting on a cell phone).

Think about playing basketball or other team sports, constantly monitoring the positions and movements of your team and the ball. These are psychomotor skills involving the integration of visual signals with musculoskeletal actions. Reading is also a psychomotor skill. Why then do most people read so slowly when we have the capacity to read so fast?

How do "fast" readers differ from "slow" readers? Slow readers frequently move their lips when reading which indicates that they are examining every single word. Even if they do not move their lips, they halt their eye movement at every word, although the eyes do not need to focus on every word.

Fast readers move their eyes smoothly and continuously across a page, never halting at single words or phrases, because the reader is focusing on groups or clusters of words. Picking up key words and phrases and ignoring the remainder is the goal of speed-reading. The focus plane of the eyes has a broader coverage and the brain is not impeded in its interpretation of the optic signals because the eyes never stop moving or scanning.

By way of analogy, when looking at a forest you do not focus on every single tree separately. If you did, it would take hours to see the forest. Instead, you focus more broadly on the entire forest but your brain is still capable of receiving information about the individual trees. Your attention may be drawn to the tree in which a red-tailed hawk is perched.

Some people learn to read in this manner naturally, but the psychomotor skills of fast reading can be taught and learned. It takes practice just like learning to touch-type on a keyboard, juggle balls, dance, or ride a bicycle.

The Academic Learning and Advancement Center, first floor level of Alden Library, offers instruction on speed-reading techniques.

Other publications and websites are available on effective textbook reading, for example, "The SQ3R Method" devised by Francis P. Robinson. The following is a summary from http://www.studygs.net/texred2.htm
SQ3R is a reading strategy formed from its letters: Survey! Question! Read! Recite! Review!

SQ3R will help you build a framework to understand your reading assignment.

**Before you read, Survey the chapter:**
- the title, headings, and subheadings
- captions under pictures, charts, graphs or maps
- review questions or teacher-made study guides
- introductory and concluding paragraphs
- summary

**Question while you are surveying:**
- Turn the title, headings, and/or subheadings into questions
- Read questions at the end of the chapters or after each subheading
- Ask yourself,
  "What did my instructor say about this chapter or subject when it was assigned?"
- Ask yourself,
  "What do I already know about this subject?"
  **Note:** If it is helpful to you, write out these questions for consideration.
  This variation is called SQW3R

**When you begin to Read:**
- Look for answers to the questions you first raised
- Answer questions at the beginning or end of chapters or study guides
- Reread captions under pictures, graphs, etc.
- Note all the underlined, italicized, bold printed words or phrases
- Study graphic aids
- Reduce your speed for difficult passages
- Stop and reread parts which are not clear
- Read only a section at a time and recite after each section

**Recite after you've read a section:**
- Orally ask yourself questions about what you have just read, or summarize, in your own words, what you read
- Take notes from the text but write the information in your own words
- Underline or highlight important points you've just read
- Reciting:
  The more senses you use the more likely you are to remember what you read
  Triple strength learning: Seeing, saying, hearing
  Quadruple strength learning: Seeing, saying, hearing, writing!!!

**Review: an ongoing process**

**Day One**
- After you have read and recited the entire chapter,
  write questions in the margins for those points you have highlighted or underlined.
- If you took notes while reciting,
  write questions for the notes you have taken in the left hand margins of your notebook.
- Complete the form for a **critical reading review**

**Day Two**
- Page through the text and/or your notebook to re-acquaint yourself with the important points.
- Cover the right hand column of your text/note-book and orally ask yourself the questions in the left hand margins.
• Orally recite or write the answers from memory.
• Develop mnemonic devices for material which need to be memorized.
  Make flash cards for those questions which give you difficulty.

**Days Three, Four and Five**
• Alternate between your flash cards and notes and test yourself
  (orally or in writing) on the questions you formulated.
• Make additional flash cards if necessary.

**Weekend**
• Using the text and notebook, make a Table of Contents - list all the topics and sub-topics you need to know from
  the chapter.
• From the Table of Contents, make a Study Sheet/ Spatial Map.
• Recite the information orally and in your own words as you put the Study Sheet/Map together.
• As you have consolidated all the information you need for this chapter, periodically review the Sheet/Map so that
  at test time
  you will not have to cram.

The following is my version of the above, but in my words and examples

**SPEED READING: AN OUTLINE OF THE TECHNIQUES**

1. **Select your reading and define the limits.** Select a reasonable amount of material to read, perhaps one chapter in
  your textbook or a set number of pages. Do not defeat yourself at the beginning by trying to read too much. How
  many of you have attempted to read all eight chapters of the textbook on Saturday when the final exam is Monday
  morning? Be goal oriented in your reading so that when you have finished, you are self-rewarded. Select the number
  of pages which you can read and learn within one or two hours, maximum.

2. **Orient yourself to the reading.** Survey quickly what you must read and learn. Skim the entire chapter from
  beginning to end, spending only a few seconds on each page. Previewing can give you as much as half the
  comprehension in as little as $1/10^6$ of the time. How is the chapter organized? Are subchapters present? Are there
  words in bold-print or italics or highlighted? Are there definitions or key-points? Are there study questions at the end
  of the chapter? Is there a summary paragraph integrating everything at the end of the chapter? Are there tables,
  figures, illustrations, or diagrams? Are there sections in fine print or detailed footnotes? What is the main topic or
  point of the chapter? What are the secondary topics or points of the chapter?

A mistake most readers make is to start reading the first page in detail, sentence by sentence, without looking at the
rest of the chapter. You do not know where you are going in the reading. You do not know what the main points of
the chapter will be. You do not know if there is a summary at the end of the chapter that should have been read first
in order to orient your learning.

Another mistake that most students make is to use a high-lighter or marking pen. Most textbooks already have the
chapters organized with bold-printed or high-lighted areas already. The organization of chapters already indicates
what parts need to be read immediately and memorized. Don't add to the clutter by high-lighting some more. Plus
you will be focusing on the high-lighting action rather than trying to understand what you are reading.

For example, imagine that you have never visited the State of Ohio before and you are looking at an Ohio map for the
first time. Would you start in the upper left hand corner and read all of the names of the towns and memorize the
numbers of all the county roads and minor state route highways, moving left to right, then down the map, county by
county? Instead I am sure all of you would first look at the entire map and develop a feel for the size and shape of the
state. You would identify which states are bordering Ohio, note the outline of Lake Erie and the Ohio River, and then
locate the major cities and the Interstate Highways 90, 80, 70, 71, 75 and 77. After this you would select a smaller
region in which to examine the finer details of towns and lesser highways. Right?
3. **Superficial reading or fast skimming.** Return to the beginning and skim the chapter again in a little more detail, spending perhaps one minute per page. Read the sub-chapter headings, the legends to the figures and illustrations, the summary the study questions, etc. If you are taking notes (just a few), then simply outline the several major topics of the chapter, leaving room to add detail with your next reading pass. With the second reading, the slightly more detailed skim, you are familiarizing yourself with new words (perhaps make a vocabulary list of new words but do not write out the definitions, yet), concepts which will be emphasized (probably exemplified in one of the figures), and so forth. You are also searching for the main points and main questions of the chapter.

Close the book and ask yourself "What are the main points that the author(s) are trying to tell me?" Also ask yourself, "What information could be part of a question on the midterm exam?" Your early focus on these questions will arouse your curiosity and thereby increase your reading comprehension. Your conscious effort to answer these questions takes your studying from the passive to active mode.

4. **Moderate reading, slow skimming.** Now begin the third reading by reading the first (topical) sentence of each paragraph, all bold or italicized print, definitions and high-lighted areas. You probably should read the first part of the chapter, the introduction that sets the stage. Reread the figure or diagram legends and examine the figures or diagrams more critically. Spend two minutes per page. You may want to start adding information to your outline of notes, but not much yet. You may make a mark in the page margin next to the most important points or the likely exam questions. Again, close your book and recite out loud, from memory, these main points and potential exam questions. If you cannot, then repeat again this section 4 of speed-reading technique.

5. **Full reading.** Finally on the fourth reading you should read the entire chapter, sentence by sentence. You will be able to read much faster now because you know where you are going, where the figures and illustrations are printed, where the definitions are given, and what major subjects will be covered and their order of appearance in the chapter. Add o your outline or notes, and again repeat the activity described at the end of section 4; recite the main points and potential exam questions.

The previewing method gave you a quick overall view of the long, unfamiliar material. You will be more alert and less likely to bog down in the details. If you are stumped on a particular point, concept or example, do not stop to figure it out. Keep reading; keep moving. Perhaps the next page will help you to understand this point, or having read the entire chapter may put it in better context. Don't allow yourself to become discouraged if you do not understand something. This will only block you mind to discovering and learning other facts and concepts and will cause you to tire. You will soon start to think of excuses to abandon your studying if you develop this defeatist attitude.

6. **Read it again.** At this point you have read the entire chapter, in hierarchical steps, four times. Now you should read the chapter a fifth time, primarily to return to those sections you did not understand. Now you should be able to figure them out because you have familiarized yourself with the entire chapter. If not, then write out questions to ask a fellow student or teacher, or check your lecture notes for clarification. Test a study partner with what you think are potential exam questions.

7. **Take notes.** On the sixth reading of the chapter you are ready to complete making detailed and thorough notes. If you had made detailed notes while reading the chapter earlier, it would have slowed you down. You would not have developed a good overall understanding of the concepts and facts. Now is the time to take notes or generate an outline. You will be able to do it more quickly and efficiently and your notes will be better organized. Write down questions to ask your study partners or teacher. Write out definitions for the words on your vocabulary list.

8. **Summary.** You are now finished with your reading and you have mastered a chapter. You have a set of notes and questions and a vocabulary list. You also read the chapter a total of six times. However, you have accomplished those 6 readings faster than you would have taken to read the chapter the old-fashioned slog through it once. Your comprehension of the material, recall of the factual information, and understanding of the concepts will be much better. When people take formal courses in speed-reading (such as the Evelyn Wood Reading Dynamics System) they usually find the most dramatic change is their increased comprehension, not the actual reading speed.

9. **Social Media Devices:** When I first wrote this how to study guide back in the 1980’s I did not have to explain the following; Turn the damned cell phones, tablets, computer websites (Facebook, Twitter, Email) OFF when you are reading and studying. If you are monitoring them in the background, then you are not efficiently learning.
Learning Strategies: Questions of scientific hypotheses and theories are based on:

1. Logical inquiry following the rules and definition of scientific reasoning, which are:
   a. Guided by observation and study of natural phenomena, living and non-living
   b. Explanatory, logical and bounded by natural laws, not supernatural hocus pocus
   c. Empirically measurable & testable through observations and experiments
   d. Tentative, never fully proven, as hypotheses and theories
   d. Falsifiable as explanatory hypotheses and theories if data doesn’t fit the model

2. Factual information and evidence, not beliefs based on anecdotes, lies, distortions, wishful and whimsical thinking, misinformation, bias, prejudice, hatred, mythology, etc.

Learning Strategies: lectures and note taking

Prepare for lecture BEFORE the lecture. Using the posted PPTS/PDFS on Blackboard as a backbone guide, open the textbook as well, and make a large flow chart or skeleton of all concepts and principles. Use 3x5 cards for all vocabulary words, definitions, examples of how they are used. Much of the vocabulary does come from High School Biology and Chemistry but there are new words that you must learn. Understand them don't just memorize them.

Note that many lecturers will use different figures and diagrams and examples; I DO NOT use the slides from the textbook, BUT the concepts and principles are the same. If you study numerous writings and explanations then you will learn better. Staring at the same figure over and over isn't going to help you grasp a concept.

Work with a study partner who is positive minded and serious about learning; take turns giving mini-lectures (explanations) to each other. Teaching somebody else is the most efficient way to learn concepts and principles.

DO NOT HAVE YOUR CELL PHONE or SOCIAL MEDIA ON YOUR COMPUTER TURNED ON; turn it off otherwise your brain is NOT fully engaged with learning, listening, comprehending, etc.

Learning Strategies: preparing for quizzes, midterm and final exams

Even though many courses will have multiple-choice or simple-answer exams, memorization of information from the textbook and lectures will not be sufficient to pass the exam. You must understand and comprehend the problems because what will be asked on the exam will be analogous to what was covered in the book or lecture, but not exactly the same situation. You will need to apply your knowledge of the principles and concepts. This is a cognitive activity known as abstraction and unfortunately the secondary schools usually don’t push students to develop this important ability. Note, you develop this ability through lots of practice; you don’t learn it as a memorization activity.

Psych yourself prior to an examination perhaps not as vigorously as these Rugby Players from New Zealand https://www.facebook.com/rugbycultureNZ/videos/1130965526968562/ but I highly recommend taking a walk to get fresh air and pleasant scenery, oxygenate your blood, invigorate your physiology, calm your brain (oh be sure to turn off that cell phone). And do not stay up all night studying the night before an exam; guarantees always a disastrous grade.

Excuses that I have often heard from freshmen, unfortunately; college is expecting YOU to participate in the learning process and we faculty aren’t going to do the work for you:

1. I didn’t have to read the textbook in high school so I thought it was the same here
2. My high school teacher gave us a summary sheet to memorize and questions on the exams were identical
3. We did all the studying in the class and not at home
4. But I had all A’s in high school so I know that I am a good student so why did you GIVE ME AN F?
   – You “earned” the F - the instructor doesn’t “give” grades
5. I knew all the answers, I just don’t do well on multiple-choice Scantron ® exams
   – Right, this excuse is very lame (life brings LOTS of exams)
I also hear the following polar opposite (contradictory) statements from different students in the same course that I am teaching

1. Nearly all of the exam questions have come from the textbook and were not explained during lectures – this isn’t fair (I attended all of the lectures but did poorly on exam)
2. Nearly all of the exam questions have come from lectures only and were not discussed in the textbook – this isn’t fair (I read the chapters 4 times but did poorly on exam.)

In reality, however, IF a student is cognitively bright then you can earn an A in BIOS 1710 or CHEM 1510 by only studying the textbook OR only studying lecture notes (but I wouldn’t recommend either strategy; do both). Certain I and hopefully all other faculty (they do) carefully write and edit the exam questions to make certain that the information and principles have been covered during lecture. However, you aren’t going to see them word for word on the exam. You need to understand the question and relate that to the principles that were explained and discussed. And just reading the chapter probably while you are not sitting with good posture and your cell phone is on and facebook is running on your computer, then YOU ARE NOT LEARNING. Studying has to be focused with only one activity, i.e. STUDYING.

Attend all lectures, read the chapter before lecture, LISTEN and COMPREHEND more than writing everything down like a courtroom secretary.

• Find a study partner or two or three, and
• Quiz each other over the material – write out multiple choice exam questions – pretend that you are the instructor making the exam
• I will compose exam questions from the summary, key terms, learning basics & applying basics
• BUT, they will not be worded or asked in the same manner
• NOT memorize & regurgitate BUT an understanding of the principles & concepts
• Explain every diagram and figure in the book to your study partner
  – What does it mean?
• Write out answers to the application questions at the end of the chapters
• Write out definitions of words in chapter
  – Test your study partner
• Think like the instructor
  – Write out exam questions multiple choice type
  – Swap these with a study partner

From every figure or diagram or chart found in the textbook and from my lectures pretend that you are me and write a multiple choice question. Produce dozens of these questions as if they were the midterm exam. Have your study partners do the same so that you have several mock practice exams; exchange them and take the tests, compare your notes, discover where you are confused, etc. I started doing this in high school and throughout college and often questions I would compose would be very similar to what was on the actual exam.

I have observed a significant drop in exam scores and course grades during the past 10 years (I have been teaching at universities for over 40 years) which correlates with the advent of the cell-phone. Numerous studies have documented the problem but the following is recent and a statistically valid study: The Relationship Between Cell Phone Use and Academic Performance in a Sample of U.S. College Students, by Andrew Lepp, Jacob E. Barkley, Aryn C. Karpinski; DOI: 10.1177/2158244015573169 19 February 2015  Abstract: “The cell phone is ever-present on college campuses and is frequently used in settings where learning occurs. This study assessed the relationship between cell phone use and actual college grade point average (GPA) after controlling for known predictors. As such, 536 undergraduate students from 82 self-reported majors at a large, public university were sampled. A hierarchical regression \( R^2 = .449 \) demonstrated that cell phone use was significantly \( (p < .001) \) and negatively \( (\beta = −.164) \) related to actual college GPA after controlling for demographic variables, self-efficacy for self-regulated learning, self-efficacy for academic achievement, and actual high school GPA, which were all significant predictors \( (p < .05) \). Thus, after controlling for other established predictors, increased cell phone use was associated with decreased academic performance.”

Yes, I am very serious about "DO NOT HAVE YOUR CELL PHONE or SOCIAL MEDIA ON YOUR COMPUTER TURNED ON; turn it off otherwise your brain is NOT fully engaged with learning." Lots of studies proving that this is the case. I wish that colleges could somehow BLOCK phones and Facebook and Twitter 23 hours a day reserving only one hour per day to chat with families and friends. If that would be the case, then nearly everybody would be earning A's and B's
Learning Strategies: Teaching the why and how, not the what and who

A couple of examples come to mind:

1. Comparison of the endoskeleton of a vertebrate versus the exoskeleton of an arthropod.
   a. The old-fashioned way would be for the students to memorize the names of the bones (human skeleton) and the various parts of the exoskeleton of (insect, spider, crayfish).
   b. The better way (integrated) would be to approach this from solving problems given the challenges of the surrounding environment both biotic and abiotic factors
      i. How does the animal grow?
      ii. How does the animal repair injuries?
      iii. How does the animal protect itself?
      iv. What are the material designs and strengths?
      v. And so forth

2. The skeletal bones and striated muscles of a cat for example
   a. The old way found in many undergraduate courses of anatomy (CVA and Human)
      i. Memorize the names of the parts (BORING; why?)
   b. The new way focuses on functional adaptations
      i. Embryological origin and development
      ii. Study of the joints and their design - mechanical advantage, lever arms, etc.
      iii. Bone architecture, shape, cross-section, density
      iv. Bone remodeling, growth, repair after breaks
      v. Sink for calcium and other chemical processes
      vi. Muscles: length, cross-sectional area, strength, types of fibers
      vii. Incorporation of principles of engineering, physics, chemistry, math, etc.

3. Classification and natural history of the salamanders (amphibian) of North America
   a. The old-fashioned way would be to memorize the names, diagnostic characters for identification and distribution (where they are found)
   b. The new way focuses on adaptations which renders the above goal much easier
      i. How do they respire? Skin, lungs, gills? Why the difference?

4. Ecology and biomes of the world (vegetation, climate and geography)
   a. The old-fashioned way would be to memorize the various maps
   b. The new way focuses on the process; how these different types of vegetation came about
      i. Earth’s rotation
      ii. Global wind patterns
      iii. Ocean conveyor belt of water currents
      iv. Mountain ranges
      v. Relative difference in surface area of ocean vs continental land masses
      vi. Earth’s tilt (seasons) and day length and solar radiation
      vii. Altitude and latitude
      viii. glaciation cycles

5. The result is that you are thinking about biology and learning the principles instead of just memorizing biological facts, i.e. HOW and WHY questions not just WHAT. However you will find that you have learned easily the what, who, when and where as background knowledge to the how & why.
Learning Strategies: comments on lab reports, term papers, essay questions, etc.

A big problem with lab reports and term papers is that students don’t clearly state the purpose (or goals, objectives, questions) of the report. Often students “take for granted” that the instructor already knows what the topic is so the student assumes they don’t need to give a detailed explanation. Always communicate clearly and thoroughly the purpose of the report and link it with a history of the scientific problem and with the information in the course textbook.

Another big problem is that students often don’t follow the required format for the lab report or term paper. Formats are given out by the instructor or are included in the syllabus. Follow them precisely so you don’t lose any points.

Students often lose many points because they are sloppy with the figures, charts and diagrams. Always clearly label both the X axis and Y axis and be accurate with the scales and statistics. Use the correctly designated graph paper, and so forth. Understand percentages, proportions, ratios, frequencies, etc. They are used throughout biology.

Another method which will guarantee a much higher grade on term papers and lab reports is to ALWAYS have your room-mate or study partner read and critique your rough draft. Don’t be embarrassed to have somebody find your grammatical, spelling and syntactical mistakes. Another person can more quickly discover your silly mistakes than you can because you will gloss over them.

When lab reports, term papers and exams have been returned, go over them thoroughly to determine what you did wrong, where you missed points, etc. Learn from your mistakes so you don’t repeat them on the next assignment. Many students refuse to analyze their mistakes; THIS is a big mistake. Analyze and learn.

If you have an essay question on a lecture examination, don’t rush into writing the answer. Think for a few minutes then write out an outline of your responses, points and arguments so that when you write the essay the organization is clear and logical. When a professor reads an essay and it is rambling, disconnected, and illogical you will lose a lot of points. Be sure to have a topical sentence or two that demonstrates that you understand the question (don’t just rewrite the question) and then go into the answer.

Always double-check the question on an exam. Look for the word NOT if it is included and circle it boldly. Many students overlook a key word in the question and then chose the wrong answer, although they understood the information.

If you are the type of student who frequently changes right answers to wrong during the last few minutes of an exam, then don’t do it. If you are the type of student who does change wrong answers to right answers when rereading your exam during the last few minutes, then do it. Everybody has different quirks so learn what your quirk is and follow the best strategy.

Maintenance of your mind, body and health

Sleep: Maintain a regular sleep schedule and get at least 7 hours of sleep per night. Do not pull any all-nighters; you will pay for it big time. Do NOT eat food or drink caffeinated beverages within 2-3 hours of going to bed, as you will not get a refreshing deep sleep. If a brief nap, 20-60 minutes, helps restore your energy level, then by all means take a nap daily. Yoga classes as well as Tai Chi teach proper posture, breathing and improve muscle tone especially of the back, abdomen and thorax. These efforts will enhance focus and relaxation, will minimize stress and anxiety, and will allow one to sleep better.

Fluids: Drink plenty of water daily, between 2 and 3 liters depending on your body weight and the amount of exercise. Caffeine beverages (various pops and soda, coffee) will increase your dehydration and being dehydrated makes you tired and depressed.

Drugs: Just say no; don’t use any drugs (unless under a physician’s direction) and by drugs I am meaning alcohol, caffeine, nicotine (smoking or chewing or non-chewing), marijuana, ecstasy, cocaine, heroin, etc. I know that I don’t need to explain to you the harmful nature of all of these drugs, legal and illegal; and I don’t want to preach.
However, many studies (and my personal counseling of students) have demonstrated that poor grades strongly correlate with abuse of recreational drugs. Tobacco products really mess-up the homeostasis of the body’s systems especially insulin and blood sugars so that you think you are more alert after smoking, but then the body crashes requiring another fix of nicotine.

**Nutrition:** Eat all three meals, or four smaller meals daily. Do NOT skip breakfast and lunch because you will throw off your blood sugar levels during the day when you need to be energetic and alert. Eat a balanced diet for each meal following an accurate food pyramid (not the federal government’s version but one that is truly healthy as below) you can’t eat TOO many vegetables, fruits and whole-grain cereals. Don’t eat a lot of fatty or fried foods as they aren’t healthy and also increase the chance of indigestion that can interfere with good sleep and study concentration. Drink plenty of fluid with your meal. Do not rush through a meal; chew every mouthful thoroughly and slowly, savoring the flavor and texture, and enjoy the meal. This is a form of mindfulness (see below).

The U.S. government’s Food Guide Pyramid which you learned in elementary school was followed by its replacement, My Pyramid, a few years ago – essentially identical and hard to view. However, both have been in error in not truly showing people what makes up a healthy diet. Why? According to Professor Willett “Their recommendations have often been based on out-of-date science and influenced by people with business interests in their messages.”

http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/pyramid/

“But, there’s a better alternative: the Healthy Eating Pyramid, built by the faculty in the Department of Nutrition at the Harvard School of Public Health. Based on the latest science, and unaffected by businesses and organizations with a stake in its messages, the Health Eating Pyramid is a simple, trustworthy guide to choosing a healthy diet. Its foundation is daily exercise and weight control, since these two related elements strongly influence your chances of staying healthy. The Healthy Eating Pyramid builds from there, showing that you should eat more foods from the bottom part of the pyramid (vegetables, whole grains) and less from the top (red meat, refined grains, sugary drinks).” NB:, especially the ones with High Fructose Corn Syrup or HFCS.

**Exercise:** Aerobic exercise is good for many reasons: keeps your weight at correct levels, improves digestion, allows for deeper more relaxing sleep as well as less sleep, increases Serotonin production so that your mind is more alert and not so depressed, good muscle tone improves your circulation which also helps with brain activity, etc. Studies have also shown that vigorous daily exercise decreases dramatically the number of colds that a person may get. I would recommend one hour of vigorous exercise at least 4 times a week, or ideally, exercise every day.

**Psychological health:** If you become so nervous, anxious and depressed, that you feel overwhelmed, stupid, useless and don’t care about classes anymore, then you need some professional help. Go to Hudson Health Services to meet with a psychologist. PLEASE don’t feel ashamed about this; treat your psychological problem the same as treating your bronchitis or ingrown infected toe nail.

**Physical health:** If you exercise, eat correct diet, get sleep, drink plenty of fluids, don’t abuse drugs and then you will probably not become sick. **However**, if you do become ill don’t put off checking in with a physician at Hudson. If you just have a cold (sinus & nasal congestion, headache and mild fever) then rest and fluids and over the counter medications (nasal decongestant and analgesic such as Tylenol or Ibuprofen) is all that you need. If you have a fever that persists for more than two day, extreme headache for more than two days, congestion that spreads to your lungs, then go see the doctors right away.

**Meditation:** Many people have discovered that various forms of transcendental meditation or mindfulness can help greatly to reduce stress and maintain better health.

**Mindfulness:** Several Mindfulness Exercises written by Dr. Dennis Merritt Jones can be found at:


Mindfulness exercises help to relieve stress and to keep you focused on your daily life. The practice of mindfulness can bring many benefits to your emotional and physical health, as well as to the relationships in your life. Mindfulness is an amazing tool for stress management and overall wellness because it can be used at virtually any time and can quickly bring lasting results. The following mindfulness exercises are simple and convenient, and can lead you to a deeper experience of mindfulness in your daily life.

Consider also the following from: http://stress.about.com/od/tensiontamers/a/exercises.htm