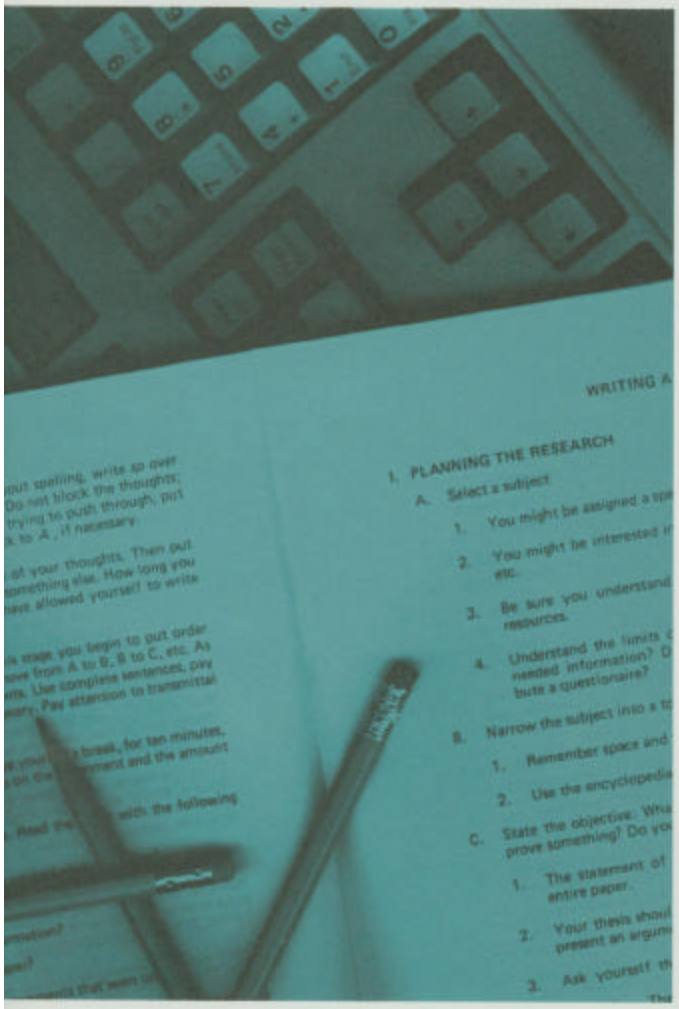
HEALTH

PROFESSIONS

CAREER

OPPORTUNITY

PROGRAM



EDUCATIONAL SURVIVAL SKILLS STUDY GUIDE

THE

TOOLS

YOU

NEED

FOR

SUCCESS

State of California
Gray Davis, Governor

Health and Human Services Agency
Grantland Johnson, ***Secretary***

Office of Statewide Planning and Development
David Werdegar, M.D., M.P.H., Director

Primary Care Resources and Community Development Division
Priscilla Gonzalez-Leiva, R.N., Deputy Director

HPCOP Staff
Josephine R. DeLeon, Chief
Karen C. Munsterman, Staff Services Analyst
Suzette Smith, Program Secretary

Student Assistants
Marie Manlangit
Teresa Martin
Rene Porche
Deanna Trujillo

OSHPD, graphics
Herbert D. Lum, Graphic Designer

Health Professions Career Opportunity Program
1600 Ninth St., Rm. 441
Sacramento, Ca. 95814
916.654.1730

Table of contents

I. Health Professions Career Opportunity Program ---------- 4

II. Academic skills: Where does your time go? ---------- 5

Suggestions for improving your study environment 7

Developing work habits that will aid your concentration 8

How to break an unproductive habit 8

Learning principles for effective time-scheduling 9

Schedule for study and recreation ---------- 10

III. Adopt solid study and learning habits ---------- 13

Studying a textbook 13

Using your textbook 14

The SQ3R method of study 15

The *PQRST* method of study 17

Good students *do* write in books 18

Finding main ideas 19

How to find the main idea 21

Efficient and effective note-taking 22

Study habits checklist 25

IV. Read right — reap rewards ---------- 27

How memory works 28

Remembering 27

Remembering what you read 30

Critical reading 32

Reading strategies 34

How to read essays you must analyze 35

Suggestions for improving reading speed 37

Rapid-reading techniques 39

How to calculate your rate 40

V. Write right — make it easy on yourself ---------- 40

Writing can be painless 40

Writing a research paper 42

Some steps to follow for composing a well-written paper 43

How to write a paper 44

VI. Using specialized skills ---------- 46

Looking at tests 46

How to read an exam 46

Studying the teacher 47

Social sciences 48

Reading the social sciences 48

How to study history 50

How to study chemistry 52

How to study physics 54

Guide to successful study of physics 55

VII. Health careers: something for everyone ---------- 56

I. Health Professions Career Opportunity Program

The Health Professions Career Opportunity Program (HPCOP) conducts a multifaceted program of activities, each directed at preparing underrepresented and disadvantaged students for admission to health professional schools. These activities are designed to provide students with the motivation, knowledge, and academic skills needed to launch a health career.

One such activity is providing the *Educational Survival Skills Study Guide*. This guide is intended to provide information on self-management skills to undergraduate college students considering a career in the health professions.

The information contained in this guide is designed to help students develop a systematic approach to mastering the rigors of a prehealth curriculum. This guide brings together a number of study skills that can significantly improve study habits. It includes techniques for managing your time, test-taking, note taking, reading effectiveness, controlling academic settings, and skills for studying social science, history, chemistry, and physics.

Achieving these skills requires time and dedication but is well worth the investment. It has been shown that students who take the time to learn self-management skills increase their reading ability, are better organized, improve their test performance, and can easily adjust to the demands made on a prehealth student.

We hope this guide is useful to you — something you can apply over and over as needs arise. May you succeed in your endeavor to become a health professional.

The Health Professions Career Opportunity Program staff would like to extend its thanks to Phyllis Elami, Education Opportunity Program counselor and coordinator in the Learning Resource Center at Chabot College, for providing us with handouts and advice on organizing this package, and to Karriem Ali, for giving us his permission to print his Chemistry Study Guide.

II. Sharpen Your Academic Skills:
Where does your time go?

As a student, you will find that time is one of your most important resources. These days, many students have difficulty managing their time. Between school, jobs, and other activities, students find themselves under increasing pressure. Sharpening your time-management skills can improve your academic performance and help reduce anxiety. In the next section, ways will be discussed to improve your time-management skills and increase efficiency in your studies.

The first step in improving your time-management skills is to assess how you actually spend your time. However, most of us estimate poorly how we use our time. To estimate accurately, find a way to objectively observe your activities. Then, keep simple records of what you do during the day. Or, you could have someone else observe and record your time use. This will enable you to assess yourself more objectively.

The next step is to evaluate your use of time. Note what you accomplish, and *don't* accomplish, during your study time. The following checklist may provide you with an idea of where time slips away.

1. Do you *lose time in getting started?*

Many students have problems getting down to the books, even though they set aside time to study. A related problem is getting warmed up. Some students seem to require greater warm-up time than others.

Some students function better in the early morning. Others are more effective late at night. If you're an early morning type, forcing yourself to study late at night leads to fatigue and spinning your wheels. Setting unreasonable goals, like "I'll get up at 6:30 a.m. on Saturday and start studying," makes for difficulties if you are a late night person. Be realistic in selecting your time(s) to study. Determine the period(s) during which you're most effective and alert. Try to schedule your study time for these periods.

- Do you put off studying by rationalizing the importance of other activities?
- Do you linger over coffee?
- Do you read the morning paper during your breaks when the time might be better used by reviewing or preparing for a lecture?
- Do you read the newspaper too thoroughly?

In other words, do you spend hours wasting time and avoiding study?

2. Do you *lose time through disorganization?*

- Are you uncertain as to what you're going to accomplish in your study period?
- Do you try to handle too many activities or cover too many work problems for a given evening?
- Do you grab the first book that's handy instead of systematically planning what you're going to accomplish and what courses you will study first?

Often it's desirable to study the most difficult or boring courses first. Then, after you've completed your goals within a specified time, reward yourself by turning to a subject you find more enjoyable. If you like to read the newspaper, use that as a reward for completing the toughest chemistry problems or whatever.

3. Do you *lose time through diversion?*

- Do you sacrifice prime working time for personal detours? The way to handle this is to set your priorities when budgeting your time.
- Do you use your prime morning hours — when you're feeling freshest — to do the laundry rather than go to the Laundromat right after classes when you're less motivated and alert?

Budget your time. Screen your most important priorities. Apply value standards. This is what busy executives do. They set priorities and accomplish the important things first, working in the significant details, and spending little time on less important matters.

4. Do you *lose time through excessive involvement?*

- After obtaining the key facts, do you dig too deeply into research in pursuit of details?
- Do you work so long on a problem that you're mentally wheelspinning and getting nowhere?
- Do you know when to stop?

If you're fatigued, it's better to change to some other activity rather than forcing yourself. If you're stuck on a problem, change activities and return to it later, rather than wasting two or three hours fussing over it. By giving it a break, you can usually solve the problem more quickly.

Establish criteria as to how deep you need to go into an assignment. If you're worried, anxious, or insecure about a subject, you're likely to overstudy by trying to cram facts helter-skelter into your head and hope for the best. Instead, systematically get the main ideas and enough supporting details to enable you to understand and answer exam questions.

5. Do you *lose time in paperwork?*

- Do you have trouble locating your notes and texts so you can integrate reading assignments with lecture notes?
- Do you screen reading materials to weed out unnecessary or unproductive matter?

Many students faced with long reading lists start plodding through book No. 1 and may finish two out of six books. They feel guilty they haven't managed to get through the others, give up, and trust in luck to help them succeed in the exams.

Develop effective skimming and scanning techniques. Such techniques will enable you to get the major concepts from all the books so you can decide which ones to study in depth or read more carefully. If you skim for main ideas and review them carefully and selectively, you'll retain more information. If you practice rapid-reading techniques to improve your speed and comprehension, you'll be able to retain more ideas in less time.

6. For reports or term papers, do you *get your writing done in the time available?*

- Do you make sample outlines?
- When answering essay questions, do you take a few minutes to jot down the major points you're going to cover?
- Do you make detailed outlines for your major writing tasks?
- Do you have an identifiable goal in your thesis?
- Do you have the major concept clearly in mind before you start writing?
- Do you get to the point, simply and directly?

7. To save time, do you *use short cuts?*

- Eliminate paperwork that serves little or no useful purpose, such as copying from the textbook to your notebook all major terms or concepts, or retyping all your class notes.
- streamline your studying by cutting out nonessentials. In your notes, leave every other page blank for comments, filling in the gaps, and expanding on important points.

Summary

Time is your greatest asset. Time passes regardless of how you use it. Your challenge should be to obtain the greatest return from your study time by properly dividing and sequencing your tasks. Spend more effort on organizing and preparing your objectives and tasks, whether for recreation or for work. Each of these must be balanced or your productivity will suffer. To make optimum use of your time, you must do the less-important activities more quickly and you must eliminate time slip-pages in all your activities.

Adapted from How to get more studying done in less time, an article by Dr. Martha Maxwell, University of California, Reading and Study Skills Service.

Suggestions for improving your study environment

1. Try to study in the same place each time so you will associate that particular area with studying. If possible, use that area *only* for studying. You will also save time you would have used deciding where to study.

2. Keep the room temperature in a comfortable range (72 degrees seems to be a good temperature for studying).

3. Overhead lighting should be indirect to reduce glare. Use a 100-watt bulb to assure the room is sufficiently lighted.

4. When using a desk lamp, do not shed direct light on your text. Keep the lamp off to the side of your work.

5. The wall in front of your desk should be blank or contain only items relating to your work (maps, schedules, diagrams, etc. Don't study by a window or in an area where you will be distracted by other people.

6. Use a straight back chair. A small amount of muscle tension will make you more alert.

7. Keep your study area uncluttered. Have a specific place for study materials (paper, pens, dictionaries, texts, ect.) and keep all distracting items (pictures, souvenirs, radio…) off your desk.

8. Cut down on distracting noises. Turn off the stereo, radio, or TV. When you study with noise, you study with less efficiency.

9. Study alone unless you are reviewing for a test, participating in a special study group, or working on a project with another student.

10. If you study in the library, try to face a wall with your back to most of the other students.

Developing work habits that will aid your concentration

Plan your schedule so that you will have enough time to study to your best advantage under the best possible conditions yet still have time for recreation and other activities.

Working conditions

1. Work in a place where noise and distractions are at a minimum. However, disregard rather than react to any disturbances you may have to encounter. Routine tasks such as arranging cards and stapling papers are less affected by noise and other distracters than are reasoning tasks.

2. Find the physical conditions most conducive to your good studying. Usually a not-too-comfortable chair and a slightly cool room are suggested.

3. Keep a place sacred for study; a place in which you study and do nothing else.

4. Keep your study place free of extraneous material and distracters, but do have such needed materials such as pencils, paper, ruler, reference tables, index cards, and calculators close at hand so you won't disturb your studying to find them.

The study session

1. Set a realistic and definite goal for each study session (*e.g.*, a certain amount of new reading, or a certain amount of review or preview).

2. Decide the order in which your jobs will be done.

3. Set a definite time to begin studying and start at that time.

4. Concentrate only on the task at hand. If you suddenly remember something else, make a note of it on a pad, put it out of mind, and attend to it later.

5. Personal problems may severely distract you from your studies. Do what you can about your personal problems. If you cannot do anything about them at study time, forget about them for that time. Concentrating hard on your studies will *help* you forget your personal problems or physical discomforts for a while.

From: University of Maryland, 1964.

How to break an unproductive habit

In most cases, behind an unproductive habit is something that feeds and strengthens that habit. You may be engaging in unproductive habits you *know* are hurting your school efforts because it is accomplishing something else for you, something about which you may not be aware. (*e.g.*, You may subconsciously delay studying, perhaps to hold off frustration you feel when you study.) If you could break the *habit* of delaying, you would reduce your feeling of frustration. Consequently, you would be more efficient and effective.

Old habits that no longer accomplish much are sometimes almost the total problem. In such cases, you have fallen into a set of behaviors for some earlier, perhaps unknown, reason. The *old* habits need to be broken for you to implement your *new* study habits.

It is *this* situation where the five-step procedure presented here is most useful. Use this procedure to break up the maladaptive habit pattern. The procedure may also contribute to alleviating deeper problems, but the appropriate thing to do when an unproductive habit reflects something deeper is to talk with a counselor.

1. ***Ask yourself what personal rewards you receive from the habit.*** If you find the behavior difficult to eliminate, you must be receiving something of value from it. Sometimes the reward is hidden or camouflaged. If you cannot identify the reason for it, a counselor might be able to assist you in understanding the problem.

2. ***Identify the specific behavior you wish to eliminate.*** Be specific! For example, do not just say, " I will stop delaying when it is time to study." Say instead, "When it is time to study, I will not read the paper, make phone calls, or watch the news. I will sit in a particular chair without delay. I will begin work within one minute. And I will not leave the chair until I have accomplished what I have agreed with myself to accomplish." *Be specific!*

3. ***Identify behaviors incompatible with the habit you wish to break.*** An incompatible behavior is one that automatically, by its own nature, eliminates the undesired habit. For example, if you have the habit of daydreaming before getting down to work, do something to counter that behavior. Writing and daydreaming at the same time can be difficult. Outlining your study plan will put you on the right track. You can find a number of behaviors incompatible with the undesirable habits. Replace your undesirable habits with these new productive habits. Such behaviors should be pleasing, even enjoyable, so that you'll want to continue the new substitute response.

4. ***Set up a system of rewards and punishments for yourself.*** Reward yourself for breaking the habit; punish yourself for failing to do what is required to break the habit. First, list all the little things you like to do, such as going to the movies, watching TV, going to a ball game, having a date, and so forth. Next, list things you would *not* like to do. These should be deprivation of something you like to do, rather than things which cause difficulty for yourself. For example, you might not allow yourself to go to the movies, watch TV, go to a certain ball game, have a date this week, or other such punishments of deprivation.

5. ***Be satisfied with modest but definite gains.*** Set your goals to accomplish what you desire over a period of time and to break the undesired habit. Plan a program of steady progress, with *gradual* improvement in mind, rather than counting on dramatic changes. Plan *in detail,* particularly in the early phases, what your rewards will be for your accomplishments and the deprivations you will receive if you do not attain your goal. Chart your progress each day. Stick to this system! You will find that you will gradually improve. Your will power is very weak at the beginning. Do not be discouraged because of failure; you may need assistance. Ask for help from a counselor. However, with time and steady progress, your discipline will increase along with the desired responses.

Adapted from an article by Dr. J. Thomas Trimble: Personalized analysis of study skills.

Learning principles for effective time-scheduling

1. ***Study at a regular time and in a regular place.*** Establishing habits of study is extremely important. Knowing when and where you are going to study saves a lot of time in making decisions about studying. Locate a study place which is comfortable for you and has few distractions (friends, noise, etc.).

2. ***Study during periods of maximum alertness.*** Some people are more efficient in the mornings and others in the evenings or late at night. Find out when you are really effective and plan to do your studying then. Utilize those periods of productivity for just that — being productive.

3. ***Limit your blocks of study time to no more than two hours on any one course at one time.*** After one-and one-half to two hours of study, you begin to tire rapidly and your concentration diminishes. Taking a short break and then studying a different course will provide the change necessary to keep up your efficiency.

4. ***Set specific goals for each study unit.*** When you fill in your schedule, actually write in what you are going to accomplish during the study period. Don't just write "do math homework" — put "math homework *problems* 10-20." Be that specific.

5. ***Plan enough time in studying to do justice to each subject.*** Most college classes are planned to require about three hours work per week per credit in the course. By multiplying your credit load by three, you can get a good idea of the time you should provide for studying. Of course, if you are a slow reader, or have other study deficiencies, you may need to plan more time in order to meet the competition of college classes.

6. ***Study as soon as possible after your lecture class.*** One hour spent right after class will do as much good in developing an understanding of materials as several hours a few days later. Check over lecture notes while they are still fresh in your mind. Start assignments while your memory of the assignment is still accurate.

7. ***Provide for spaced review.*** That is, a regular weekly period when you will review the work in each of your courses and be sure you are up-to-date. This review should be cumulative, covering briefly all the work done thus far in the quarter.

8. ***Plan a schedule of balanced activities.*** College life has many aspects which are very important to success.

9. ***Utilize odd hours during the day for studying.*** The scattered one- or two-hour free periods between classes are easily wasted. Planning and establishing habits of using them for studying for the class just finished will result in free time for recreation or activities at other times in the week.

10. ***Trade time*** — *Don't steal it.* When unexpected events arise that take up time you had planned to study, decide immediately where you can find the time to make up the study missed and adjust your schedule for that week.

Schedule for study and recreation

Many students, recently initiated to college life, find themselves lost in the maze of study as it combines with new and old patterns of work and recreation. College requires the student to schedule his or her own classes, study time, and recreation periods. Many students have never developed a systematic approach to budgeting their efforts and energy. If the lack of a systematic budgeting time were ever apparent, it is most markedly so at the beginning of college study. The laments of the many failing students should be a forceful example for those who question the importance of budgeting their time. It is a proven fact that if you plan your work and do it, you will have *much more time for recreational activities.* So, *plan your work and work your plan.*

Some suggestions for scheduling your time

1. Make your schedule *fit* your own needs. You can't copy a friend's plan and expect it to work for you.

2. Record two different kinds of activities — fixed times (classes and meetings) and unfixed times (recreational and personal affairs).

3. Plan to study two hours for every lecture credit.

4. Schedule study times as soon as possible after and just before your lectures.

5. Use your odd hours during the day to study.

6. Schedule a weekly review for each course.

7. Allow time in your schedule for recreation.

8. Expect to make changes in your schedule, but stick as closely to it as possible.

9. Complete the weekly time-chart covering how you think you spend your time, make changes you think necessary, then plan a new schedule indicating *exactly* how you should plan to spend your time. Use different colors to indicate fixed and unfixed times.

10. Anticipate the activities you wish to participate in; plan ahead to allow time and make revisions in the schedule which will improve your efficiency.

From the Learning Assistance Center, Human Development Services, California State University, Long Beach

To be used with sample time schedule
Hours spent per week – 168 available hours in one 7-day week.

Total time in studies – (ideal hrs/wk = 42 hrs)

In-class time (16 units w/labs)	=	22 hrs
Study time	=	31 hrs
		53 hrs (sample schedule)

Eat/sleep (ideal hrs/wk = 84 hrs)

Sleep	=	56 hrs
Eat	=	21 hrs
Dress	=	7 hrs
		84 hrs (sample schedule)

Free time (ideal hrs/wk = 42 hrs)

Transportation	=	5 hrs
Laundry	=	2 hrs
Clean room	=	1 hr
Miscellaneous (shop, read, jog, nap, stray from time schedule, etc)	=	23 hrs
		31 hrs (sample schedule)

Study time: indicates suggested hours devoted to study per class.

Calculated by: 2 hrs study/1 hr lecture
1 hr study/1hr lab

	In class hrs/wk	Study time per hr in class	Total study hrs per wk/class
Calculus 21A	4 hrs	x 2	8 hrs
Chem 1B	3 hrs	x 2	6 hrs
Chem 1B (lab)	4 hrs	x 1	4 hrs
Ani Sci	2 hrs	x 2	4 hrs
Ani Sci (lab)	1 hr	x 1	1 hr
English	4 hrs	x 2	8 hrs

Total study hrs/wk: 31 hrs

Study hours as reflected on sample time schedule:

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Calculus	2.5	2.0	2.5	2.0	0	–	.5	9.5
Chemistry	2.0	–	3.0	2.0	2.0	–	.5	9.5
Ani Sci	0.75	2.0	0.75	–	1.0	–	.5	5.0
English	–	2.0	–	2.0	–	2.0	1.0	7.0

Total hrs/week studying: 31.0

III. Adopt solid study and learning habits
Studying a textbook

First step: *Preview*

The first step toward the successful completion of any course is to preview the entire textbook. Ideally, you should make this preview before the end of the first week of class. The textbook has been designed by the author as a tool for mastering the subject. The preface, foreword, introduction, table of contents, index, glossaries, exercises, headings, subheadings, italics, and footnotes helps you to improve your efficiency and effectiveness in using the book. Previewing your textbook will help you discover:

1. The *purpose, limitations*, and *scope* of the book as stated by the author in the preface or foreword.

2. The *degree of difficulty* of the topics listed in the table of contents and index.

3. The *extra help* the book offers you for mastering the contents through summaries, chapter glossaries, review questions, problems, bibliographies, and typographical aids to important ideas, such as italics, headings, marginal notes, and footnotes.

When you preview, look at each component of the book so that you can understand what it is trying to teach.

Title: Reword the title so it asks a question. Write down other questions you think might be answered in the book. Apply the classic six questions — *who, what, where, when, how*, and *why* — to the title. Make up one question about the title of the book that involves you personally.

Author: Who is the author? What makes the author an expert? What else has he or she done or written?

Copyright Date: Is the book up to date? Have there been any new theories or developments in the field since the book was written?

Preface, Foreword or Introduction: Does the author tell you why he wrote the book? Does he recommend the best ways to use it?

Table of Contents: Turn the entries into questions. Review what you already know about the listed topics.

Test Chapters: Look through a few chapters. Do introductions to each chapter outline the contents? Is each chapter subdivided under different headings? Are there maps, tables, graphs, and pictures? Is there a summary at the end of each chapter? Are there questions, exercises, or other study helps for each chapter?

Glossary: Does the book have a glossary? Is it at the end of the book, or do glossaries follow each chapter? How many new words will you have to learn to understand the subject?

Bibliography: Does the author provide a list of other books that you may refer to if you have difficulty understanding the text or if you want more detailed information?

Index: Read the alphabetical list of main ideas and persons discussed in the book. How many items are familiar to you? In addition to using the index for reference, you may use it for review before examinations. If you are able to read down the list of entries and remember something relevant about them, you probably have a good grasp of the subject.

Second step: Study-read the chapter

One method of study-reading that has proved helpful to thousands of high school and college students is the *SQ3R* method originated by Francis P. Robinson, a distinguished psychologist at Ohio State University. *SQ3R* stands for the five steps in the method: *survey/question/read/review/recite*. *SQ3R may* prove helpful to you if you are looking for a method that will enable you to do the following:

1. Select the important ideas and facts in your reading.
2. Understand and organize these facts and ideas quickly.
3. Remember them for class recitations and examinations.

Using your textbook

Look in the front–

A. Read and think about the table of contents.

   1. This will show you the overall organization of the course and help identify what's important.
   2. It will get you interested in the material.

B. Glance over any preface or foreword to see what the book is trying to convey.

C. Consider the title. This is often a significant statement about the book's slant.

D. Have you heard of this author before? Is it your instructor?

Look in the back–

A. Glance at the index. This is a listing of subjects and the pages where they can be found.

   1. From the percentage of known words, you can tell how difficult the text will be for you.
   2. You can see, in some detail, what the course will be concentrating on.
   3. You can look up specific items of interest.
   4. As a review for tests, you can easily look up unknown items since the page number is given.

B. Is there a glossary listing of difficult words and their definitions?

   1. The main concern of many courses is to teach the vocabulary of the subjects. This is a vital section that shouldn't be ignored.
   2. Make a page tab out of scotch tape, and undertake to study and learn these words during odd moments between class time which might otherwise be wasted.

C. Determine what other useful materials are in the back before you need them. You don't have to read them now; just know they exist.

D. Determine how a chapter is constructed.

All chapters will be put together the same way. If one chapter has a summary, they all will; if one chapter has questions, they all will. Use this knowledge when you have a reading assignment. Structure your approach accordingly.

The SQ3R method of study (survey, question, read, recite, and review)

1. Survey – to get the best possible overall picture of what you are going to study before you study it in detail. You need to know the big picture before you can make intelligent decisions about the details.

a. Survey a book

1. Read the preface – note the book's purpose.

2. Read the table of contents – note what the book contains.

3. Leaf through the book – glance at headings; occasionally read the last sentence.

b. Survey a chapter

1. Read the headings – note the organization of the material: how topics go together and follow each other; note the main subject of each section.

2. Pay attention to order and kinds of headings – main headings or subheadings.

3. Skim some sentences within the chapter.

4. Look at pictures and charts; read captions.

5. Read the summary – to obtain most important points of the chapter.

2. Question – Questions give purpose to our learning. People seem to remember an answer to a question better than by just reading or memorizing. Ask questions every time you note a heading.

a. What does a word or phrase mean?

b. What does it mean in the present context?

c. Be alert and consider answering questions by the author in the selection of the chapters that follow.

3. Read —

a. Read *actively* — to answer questions raised in your mind.

b. Continually challenge yourself to make sure you understand what you have read.

c. Note important *terms* — especially italicized words or phrases that emphasize important terms, concepts, and principles. Understand what they mean.

d. Read *everything* — including tables, graphs, and other *illustrations*. Read and analyze these carefully. Illustrations convey information that cannot be easily expressed in words.

4. Recite — Recitation is an effective device for learning while reading a book. The only way you can really find out what you have remembered and understood from your reading is to recite to yourself. To make sure you understand and remember, stop periodically and try to recall what you have read.

a. Try to recall *main headings* and the *principle ideas* under each heading.

b. Try to give a *synopsis* of your reading without looking at the pages.

c. Note your *omissions* and *errors*

General rule: Stop at intervals to recite the substance of each major section of a chapter. Every time you see a new heading, stop and recite the material in the previous section. Do this for each side heading, then double up when you come to a main heading.

1. If you are learning disconnected material (rules, items, foreign language vocabulary, names, laws, formulas), recitation will be your principle form of study and should run as high as 90 or 95 percent of your study time.

2. For well-organized story-like material (history, philosophy), recitation may be 20 or 30 percent of the study time.

5. Review — A review is a survey of what you have studied.

a. *Skim* over book headings and ask yourself what they mean and what is under them. For each of the headings, you can recite the points you have read and hope to remember.

b. *Reread* enough to refresh your memory and see that you haven't left anything out.

c. *Review* summaries — first, see if you can recite them, then check yourself by rereading.

When it's time for your overall review —

1. Also review your notes on the chapter.

2. Review once when you begin a section, and try to review several times before test preparation.

3. Final review should emphasize recitation. It should be more intensive — go over all of the material for the examination. Pay special attention to material that you might easily forget.

The PQRST method of study

1. Preview (general picture)

- Break down the text into topics and subtopics (also by author).
- Focus on key sentences at the beginning and end of paragraphs to get a general idea of what the paragraphs are about.
- Read the summary at the end of articles or chapters.
- Use the technique of scanning during your preview.

2. Question

Often, a list of questions are at the end of a chapter. Read the questions after your *Preview* and keep them in mind while you are carefully reading your assignment. Reading the questions:

- gives you immediate things to look for
- helps you concentrate

3. Read (for ideas, not just words)

Reaction — think hard about what you read.

4. State (mentally, or write down)

Repeat aloud what you have read. It will give you a better understanding of what the material is about.

- Stating gives you better organization, comprehension.

Spend at least half your study time in reflective thinking: If you have one hour to study a topic, you will generally do better to spend 30 minutes (or a little less) in the *Question* and *State* steps.

5. Test (yourself)

This is a shortened run-through of the *State* step but done for purposes of review. Memory retention takes place when you review, not because your eyes run over material a second or third time, but as a result of the way your brain functions when it starts thinking material through for the second or third time.

6. Conclusion

Every step of the *PQRST* is a necessary link in a chain that leads to most effective study. However, *it cannot work* miracles. It will not be successful without you spending time and working at it.

Compare this method with the *SQ3R* method of study. They are substantially the same, although stated differently. Use one of these tools to help you be at your best when you study.

Adapted from How to Study, Thomas F. Staton & PEP Tutorial Program, Harriette S. Stevens, Tutor Coordinator

Good students *do* write in books

Why do we underline or mark a textbook?

A. We underline to find and select the author's *key* ideas and *supporting* ideas. Underlining:

1. forces us to scrutinize the text material, to follow the author's discussion or argument.

2. keeps us mentally alert, improving learning.

3. records key ideas for review purposes, making them readily available for discussing the text in class, when writing papers, or when studying for exams.

B. We *underline*, *circle*, or *box* words for further study.

C. We make *margin notes* to record our reflections of the reading or to note important words or concepts.

When do we underline or mark a textbook?

A. Underline while reviewing the assigned reading during the *last step* of the *SQ3R* method (see next page).

B. Be sure to *Survey, Question, Read, and Recite* before underlining.

1. Key words and ideas are easier to select while reviewing after a thorough reading of the material.

2. If we underline and mark when first reading the material, we may underline unimportant ideas or too much of the text, making the underlining useless and the book a mess.

How do we underline or mark a textbook?

A. Differentiate between *main* ideas and *supporting* ideas.

1. Put a *double* or *wavy* line under main ideas, a *single straight* line under supporting ideas; or use different colored highlighters or marking pens.

2. Use an *asterisk* or other *symbol* for special ideas, such as the thesis sentence or the culminating ideas of an argument.

B. Use *vertical brackets* at the margin for three or more lines of material.

C. Use *numbers* written above words or in the margin to show a series of ideas, arguments, steps, or facts. Sometimes the author supplies the numbers or uses transition words to enumerate a series. Circle or box these so you'll be able to find them quickly later.

D. *Circle* or *box* important terms or concepts, especially those needing further study.

E. Keep margin notes concise and clear.

1. Use brief notes to *summarize* an idea or argument.

2. Use notes to record *questions* or *disagreements* about the text or list terms to look up.

3. Use notes to record *previous knowledge* associated with the reading, such as: *200 years before Columbus.*

4. Use notes, such as *compare p. 23*, to list *cross references.*

5. Use *abbreviations* or private *symbols* in margin notes to keep them brief.

6. *List* important marked pages, such as those describing a character or those containing a chemical process, on a *flyleaf* for easy reference.

Finding main ideas

Scenario: A group of home economics students are about to bake their first cake. Before them are the various ingredients needed — sugar, salt, flour, shortening, milk, eggs, and so on. In their mind, they have tasted the cake and imagined how the finished product would look. Not one of the ingredients before them gives them that thought or taste, yet they know that if every thing is put correctly together, they'll have the cake. All of their efforts and all the ingredients are being used for the purpose of coming up with a finished cake. Each ingredient must relate properly to the cake, or baking it would be a disaster.

So it is with reading a paragraph. Each sentence in the paragraph is somehow related to the rest of the paragraph. Each sentence contributes to the total meaning. You must read the entire paragraph for the real meaning. If, somehow, you can find the main ideas of a paragraph quickly and efficiently when your purpose in reading is to get the gist of the material, you will read faster and with better understanding. How can you do this?

Read the following paragraph and find its main idea.

Paula waited expectantly for her older brother, Joe, to take her to the circus performance in town. When they arrived she quickly found her seat. She tapped her foot to the music of the circus band. She sat at the edge of her seat as she watched the animal trainer putting wild tigers through their performance. She gaped at the trapeze artists. She laughed with glee as the clowns put on their acts. Joe bought her a hot dog and she munched on it delightedly.

Which of the following sentences represents the main idea of the paragraph?

a. Paula went to the circus.

b. Paula enjoyed watching the clowns at the circus.

c. The circus comes to town once a year.

d. The circus band did not play.

e. Paula enjoyed her day at the circus.

Choice a — Paula went to the circus — is too general. The paragraph is more specific, concerned with only one aspect of the circus visit. It omits many of the aspects of the circus trip — for instance, the mode of transportation, or how Paula was dressed. *Choice b*, on the other hand, is too specific. Watching the clowns at the circus is only one of the things that Paula enjoyed. *Choice c* — The circus comes to town once a year — is irrelevant. Paula's feeling is being discussed, not the circus itinerary. *Choice d* — The circus band did not play — is false. The paragraph states that Paula tapped her feet to the music of the circus band. *Choice e* – expresses the main idea. A main idea should include the major consideration of the author and should reflect the author's point of view. In this paragraph, the major consideration concerns Paula's reaction to the circus; the point of view involves a favorable reaction.

How do you find the main idea of a paragraph? Sometimes the author is kind enough to state it in one sentence. This sentence can be found anywhere in the paragraph, although it is most often found at the beginning or at the end. However, you can't depend on a main-idea sentence. The best way to find a main idea is to ask three questions about the paragraph:

1. Who or what is this paragraph about? In our paragraph, the answer to this question is — Paula.

2. What aspect of the who or what is the author concerned about? — Paula's reaction to the circus performance.

3. What does the author want us to understand about the who or what? — that Paula enjoyed the circus. This, then, is the main idea.

With the three questions in mind, read the following paragraph carefully; determine the main idea:

Not all insects are enemies of man. The silkworm spins threads of silk, which despite the popularity of synthetic fabrics is still an important textile material. In addition to producing beeswax and honey, the honeybee aids us immeasurably by pollinating many of the angiosperms upon whose seeds and fruits we depend for food. Also to be included among man's insect friends are those species, such as the ladybird beetle and many others, that prey upon our insect enemies and thus help us to keep them under control.

Who or what is this paragraph about? — certain insects.

What aspect of the subject of certain insects is the author concerned about? — the relationship of certain insects to man.

What does the author want you to understand about the relationship of certain insects to man? — that certain insects are friends of man. This is the main idea.

You will have many opportunities to practice finding the main ideas of many different types of paragraphs. Remember that each paragraph has one central thought and this central thought can be stated directly or it can be implied.

Where the main ideas are

The main idea of a paragraph is often — but not always — contained in the first or last sentence of the paragraph. To find the main idea of any paragraph, ask three questions about the paragraph:

1. Who or what is the paragraph about?

2. What aspect of the who or what is the author concerned with?

3. What does the author really want you to understand about the aspect of the who or what?

How to find the main idea

1. Read the first sentence of the paragraph carefully.

2. If this is the topic sentence, decide what the paragraph is going to be about.

3. Skim through the rest of the paragraph to find out whether it all bears on this topic.

4. If it does, the first sentence contains the main idea. Underline as little of it as you can and still include enough key words to carry the idea.

5. If the first sentence does not contain the main idea, answer in your mind this question: *What does the author want me to know from this paragraph?*

6. Find a phrase or sentence that expresses this answer in a compact form. Underline it. Some places where you may find the main idea:

   a. Second sentence. The first sentence may be a transition, referring back to the main topic, which is stated in the second sentence.

   b. In the middle. Sometimes the first part of the paragraph is devoted to a build-up for the main idea, which is stated in the middle and then explained further in the rest of the paragraph.

   c. At the end. The paragraph may start right in on the details to be presented, then sum up the details in a topic sentence at the end.

7. If you still cannot find a phrase or sentence that expresses the answer to the question in No. 5, you may need to underline a *few* key words here and there in the paragraph and see what they add up to. Then, make a brief note in the margin. Some types of construction are:

   a. Enumerative pattern. Sometimes the whole paragraph is composed of details, with no summarizing sentence. In this case, you will have to ask yourself, *What is this a list of?* Make a brief note in the margin and underline one *key word* from each item in the list, if you feel it is important. Put a number in the margin opposite each key word.

   b. Time pattern. If the events have to happen in a certain order, it is usually easy to tell what is taking place.

   c. Contrast pattern. The first part of the paragraph develops one point of view and the second states a different one. No statement in the paragraph summarizes the two.

Efficient and effective note-taking

Lecture styles vary greatly. Some lecturers are beautifully organized; some ramble; some present an hour of anecdotes and leave the student to determine their significance. It is imperative you figure out a lecturer's style and how it conveys ideas. In the case of the rambler or storyteller, you may find yourself at the end of an hour with only a sentence or two written down, which may leave you with a feeling of insecurity. If this happens, you might want to check with other students, but don't be surprised if your one or two sentences do, indeed, represent the crucial points of the lectures.

Purposes of taking notes

A. To take efficient notes, the student is forced to *listen carefully and critically* to what is being said.

B. Taking notes aids comprehension and retention. Personal notes in one's own writing are easier to understand and remember than textbook material.

C. Lecture notes should be concise and with a complete outline of important points and ideas, especially those considered most important by the professor.

D. Lecture notes clarify ideas not fully understood in the text, or they elaborate on things the text mentions only briefly.

E. Lecture notes with notes taken from textbook material are excellent for review. They provide a gauge to what is important in the textbook.

Often students complain they are unable to determine during the lecture what is important and what might just as well be left out. These students may be too busy writing to listen, attempting to take down the professor's every word, writing page after page of isolated facts and details but missing a general understanding of the material. Following are some suggestions to aid you in taking efficient and effective lecture notes.

Before the lecture

The single most important thing you can do is read or skim the text prior to attending the lecture. This will enable you to:

A. Get a *general overview* of main ideas, secondary points, and important concepts.

B. *Listen* with understanding and determine what is relevant and irrelevant.

C. *Associate* familiar terms with unfamiliar terms and concepts.

1. Look the terms up before class.
2. Listen for an explanation during the lecture.
3. Ask the professor or teacher assistant for an explanation.

D. Note *unclear portions* of the material.

1. Listen for an explanation during the lecture.
2. Develop questions to ask in class.

E. Look for *gaps* in information that should be clarified or filled in.

During the lecture

A. Structure and organization

Develop your own method of taking notes. The following suggestions may be helpful:

1. Use a *separate notebook* for each course. If several types of notes – such as lecture notes, notes on outside readings, and computation of problems – are needed for one course, you may want to arrange them on opposite pages for purposes of cross-reference.

2. Notes for each lecture should begin on a *new page*. This makes for greater legibility and allows for more freedom in organization.

3. *Date* your lecture notes and *number* all pages.

4. Make your notes *brief*.

   a. Never use a sentence when you can use a phrase, or a phrase when a word will do.

   b. Abbreviate and use symbols when possible.

5. Put most notes in your own words. However, the following should be noted exactly:

   a. *formulas*

   b. *definitions*

   c. *specific facts*

6. Note your lecturer's *pattern*. He or she may summarize the text and highlight important points or try to draw relationships between new and previous understanding. The professor may discuss related outside material, while you may be expected to study the textbook material on your own.

   a. If the instructor is highlighting the text, take down those explanations and examples. Seeing a concept stated in more than one way can help you understand it.

   b. If relationships are drawn and questions are asked, note the questions and answers. If no answers are given, find them after class.

7. Don't worry about outlining but use *indentations* to distinguish between major and minor points. Numbers and letters may be added later if you wish. However, if the lecturer makes four or five points, list them. Be sure to use numbers as a check on having taken them all down.

8. Note *unfamiliar vocabulary* and *unclear* parts. If the lecturer discusses something you don't understand, take it down as best and as completely as you can. Later check the text or at least know what questions to ask if getting help from someone. An instructor who knows just what you don't understand is in a better position to help you.

9. If you should miss something completely, leave a *blank space* and get it later.

10. Use *margins* for questions, comments, notes to yourself on unclear material, and so forth.

11. Develop a *code system* of note-marking to indicate questions, comments, important points, due dates of assignments, and so on. This helps separate extraneous material from the body of notes and helps point out areas which are unclear. Margins are excellent places for coded notations. Some suggested codes are:

    ? — not clear at time of lecture

    imp or *!* — important

    Q — question

    * — assignment

    C — comment (student's)

12. Attempt to differentiate fact from opinion.

B. Content

1. Notes should include main ideas and enough subordinate points to clarify understanding.

2. All formulas, rules, definitions, and generalizations should be included.

3. Inclusion of the speaker's illustrations and examples may help clarify concepts when notes are reviewed.

4. Margin notes help you find specific items faster.

5. Instructors usually give clues as to what is important to take down:

    a. previews and summaries

    b. material on blackboard, other visual aids

    c. repetition

    d. vocal emphasis

    e. questions asked of the class

    f. word clues: the four causes of, four aspects of, therefore, in conclusion, and so we see, hence, in a like manner, on the other hand, however, cause-effect, relationships, and others.

After the lecture

A. Go over notes as soon as possible after the lecture.

1. While the lecture is still fresh in your mind, clear up illegible writing, check for errors, and fill in more facts and examples. Clear up misunderstandings or fill in missing information by consulting the lecturer, teacher assistant, classmates, texts, or additional readings.

2. Immediate review is *essential* to retention. Unless you review within 24 hours after the lecture or at least before the next lecture, retention will drop sharply and you will be *relearning* rather than *reviewing*.

3. Recopying notes without thinking about or revising them does not necessarily aid retention. A more helpful practice is to *reorganize* the material and put it in *your own words*. For a well-organized lecture, an outline can suffice, but when important ideas and relationships are scattered throughout, a technique called *mapping* can be very useful in restructuring and putting together the relevant points. This technique forces you to critically evaluate material in terms of main ideas, secondary points, and details, and to structure this content in an organized and coherent fashion. Relationships must be observed and established; irrelevant material may be excluded. This can be of the most effiecient means of immediate review for optimal retention.

Study habits checklist

Previewing

1. Before you begin studying the book, do you read over the table of contents?
2. Before studying an assignment in detail, do you make use of the clues in the book such as headings, illustrations, and chapter summaries?

Reading

3. Do you try to get the meaning of important new words?
4. As you read an assignment, do you have in mind questions that you are actually trying to answer?
5. Do you look for the main ideas in what you read?
6. Are you able to read without saying each word to yourself?
7. In addition to reading the required textbooks, do you read other materials for your courses?

Note-taking while reading

8. As you read your assignments, do you take notes?
9. Do you review your notes soon after taking them?

Remembering

10. Do you try to find a genuine interest in the subjects you study?
11. Do you try to understand thoroughly all the material you should remember?
12. When studying material to be remembered, do you try to summarize it to yourself?
13. Do you distribute the study of a lengthy assignment over several study sessions?
14. Do you try to relate what you are learning in one subject to what you learn in others?

Report-writing

15. Before writing a report, do you collect information by doing research in the library?
16. Before writing a report, do you make an outline?
17. In writing a report, do you clearly indicate the main idea of each paragraph?
18. In writing a report, do you rewrite your first drafts?

Listening and taking class notes

19. During class, do you listen for main ideas?
20. Do you take notes?
21. Do you revise class notes soon after class?

Preparing for class examinations

22. Before an exam, do you review the important facts and principles?
23. Do you combine important notes from your textbook and class into a master outline in studying for a major examination?
24. Do you make-up exam questions that you think will be asked, and then answer them?
25. In studying for an examination do you distribute your time among the questions?

Taking exams

26. In taking exams, do you read the directions and the questions with care?
27. At the start of an examination, do you make plans for suitably distributing your time among the questions?
28. In taking an essay exam, do you outline your answer to a question before you start answering it?
29. At the end of an exam, do you proofread or check your answers?

Planning time

30. Are you up-to-date on your assignments?
31. Do you have a study plan, in which you set aside time each day for studying?
32. Do you divide your study time among the various subjects to be studied?

Arranging physical setting

33. Is your space on your desk or table large enough?
34. Is your study desk or table kept neat – one that is free of distractions?
35. Do you study in a quiet place and free from noisy disturbances?
36. Do you study by yourself rather than with others?
37. When you sit down to study, do you have the equipment and materials you need?

IV. Read right — reap rewards

How memory works

What is memory? Where is it located in the brain? How does it work? The mechanisms of memory have puzzled the inquisitive of every age. Plato attributed to Socrates one of the earliest theories: that every sensation and thought we have is imprinted in a bed of modeling wax located in the soul. Since that time, scientists have proposed that memory resides everywhere from the temporal cortex of the brain to the spinal column to the retina. The fact remains that no one is quite sure where memory is stored.

Scientists feel fairly confident that memory is an associative activity, meaning it relates various stimuli to corresponding responses. In very earliest childhood, our response to stimuli is automatic; while we may be receiving input that enters the memory mechanisms of the brain, we do not have a fully functioning memory. Later, as we begin to explore the world around us and particularly as our original reflex responses to certain stimuli prove unsuccessful, memory comes into play. Viewed this way, memory then is the sum of our experiences. The recording of those experiences is what some scientists refer to as *memory trace*.

There are essentially two research perspectives on memory: first, that memory is a *static* system, meaning that memory networks exist, but it takes a stimulus to trigger memory; the second, that memory is *dynamic*, constantly reverberating in the mind. Each school of thought, however, agrees that memory is ultimately a function of a certain nerve cells, or *neurons*. There are three basic types of neurons: *sensory* (afferent), *motor* (efferent), and *associative* (internunciatory). Memory seems to rely on associative neurons — billions of them.

A functioning memory, or memory trace, is a network of neurons that works like this: each neuron has one or more *dendrites* and a single *axon*; a stimulus enters through the dendrite; if the stimulus is sufficient to fire the neuron, an electrochemical occurrence takes place; an electrochemical wave then moves out along the axon and is in turn communicated to dendrites of other neurons in the network. Just how many neurons comprise the memory network can only be speculated.

Moreover, memory seems to be an illusive activity that resists scientific pigeon-holing. Take the dynamic memory theory for example. Proponents argued that the electrochemical wave set up by one stimulus reverberated throughout the nerve network, continuously firing dendrites, and thus memory existed in the active state. That seemed plausible enough until other researchers froze the brains of animals, stopping all organic motion for months. When the brains were thawed, they produced electroencephalograms almost identical to those produced before the freezing process. Memory had survived in a nonactive state.

Scientist now believe there may be room in memory research for a dynamic and a static theory of memory networks: short-term memory may be of a more dynamic nature, while long-term memory may be more static.

However, argument continues as to the location of the neuron network responsible for memory. One popular concept holds that memory is distributed over certain parts of the brain. Some parts store visual images; others hold auditory, tactile, and other memories. Yet another theory argues that all neurons are equally well-suited for storing memory, and it may be that different neurons belong to various memory traces at different times.

Memory research is still a very speculative activity. Out of all the speculation, however, two things are known about memory. First, without memory the ability to learn would not exist. Second, we all seem to possess memory; and so learning about how memory functions continues.

From NUTSHELL

Remembering

Psychologists do not fully understand just how memory works. It has been experimentally proved that tiny physical traces of what we experience remains with us: electrical stimulation of the brain can reproduce in our consciousness sounds, sights, and smells of events — as vividly as if they had just happened — not thought of in years. Until stimulated, we have no conscious memory. Apparently we never lose what we once experienced: it's still there, physically encoded in our brain cortex. The problem is to get at it, as every student knows.

It has been proved that learning techniques help retention and recall. The human mind is comparable to a data bank, and certain methods of input help us consciously produce what we need when we need it. The process of calling back to consciousness what we once consciously knew is a mystery. There is no button to push, no electric prod to apply to the skull. But here are some proven methods of facilitating memory.

1. *Above all, understand what you must remember*. Set up a frame within which to organize the details and their *relation ships* to each other. If the whole makes sense, the parts are easier to recall.

   Forced to remember the names of every nerve in the human body, the medical student, knowing the function of each nerve and how it interacts with the others, will more easily remember.

   With a thorough understanding of purposes, trends, philosophies, and the broad sweep of events, the history student will better remember names, dates, and other details.

   The language student will better remember the inflections of a language — the individual prefixes and suffixes which signal number, tense, and so on — if he or she has a grasp of basic structure.

   In other words, remember things in *context* of principles, theories, and important generalizations. Before you try to fix details in your mind, know the structure and main emphasis. The *SQ3R* (page 19) and *PQRST* (page 20) methods of study, with their emphasis on surveying, questioning, and reading for main ideas are valuable aids.

2. The more thoroughly and the deeper you go into a subject, the better you remember it. Apparently, broadening knowledge increases the associative links between aspects and makes the whole structure stronger. This is one virtue of extra reading, doing extra problems, seeking out other points of view, and tracking down ramifications.

3. Get beyond the recognition stage, to the recall stage, the first time you encounter something you know you will have to remember. A certain amount of forgetting is inevitable, but this method retards forgetting and makes recall easier.

   The *SQ3R* and *PQRST* methods of study puts heavy emphasis on the *Recite* or *State* stage for this very reason. Closing the book and going through the *conscious effort* of recalling the main points of what you have just read, *while they are still fresh in your mind,* seems to open the recall channel at a time when it is the easiest to open. The material seems closer to the surface — more easily accessible to review — if the attempt to recall is made immediately after the first reading.

   On second reading, the emphasis is on *conscious effort:* For the main points and key details to be easily understood, you must be more than familiar with what you just read. Close the book and pull the points and details back to consciousness. Write them out in your own words if necessary; when you can say these things in your own words, you have made them yours.

4. In certain subjects — foreign languages, sciences, and math, for instance — the process known as *overlearning* is of material help and, in fact, can be essential.

   Overlearning is defined as "practice well beyond the point of mastery." It is an extension of the conscious effort to recall, to the point where conscious effort is no longer needed. "Overlearning results when a person continues to use a response repeatedly, with confirmation."*

   Do you remember how you learned the alphabet? You overlearned. Verbs, formulas, comparative anatomy — whatever you have to know without reaching for it — should be overlearned. The process is speeded if you use sight, sound, and feeling to help you; write it down and say it aloud, let the senses reinforce one other.

   A pack of file cards is often helpful. If you are studying complicated terminology for a science course, for instance, you can write the term on one side and its definition on the other. Flip through the pack from sides up and try to recall what is on the back; reverse the process; then start at the middle of the pack and work forwards or backwards. (It has been proven that for any long memorizing job, the ends are memorized first, the middle last.)

5. The importance of associating ideas has already been emphasized, but it often helps to build associations with what you have to remember. Doing this is like constructing a chain that will lead you to what you want. If you have one end firmly in mind, it will lead you to the other end. Human minds vary greatly in the associative links to which response comes easiest, so there is no one best method. For most people, a multisensory approach is usually best. Here are a few that have worked:

   a. *Visualize*. Some people have vivid visual memories (they picture how things look). If you find yourself visualizing often — if you remember better from charts and graphs than from the printed page, or if you remember how the page looked when you are trying to recall what was on it, you can make this tendency into an effective *aide-memoire*.

      In a history course, for instance, make yourself a time chart. If you are the medical student memorizing all the nerves, visualize the nervous system and attach *labels*. If you are taking a statistics course, *visually* remember the relationships between standard deviations, *z* scores, *t* scores, and percentile ranks, and then reason from there. In recalling verb forms or vocabulary words, make a deliberate attempt to visualize the words.

   b. Use verbal *mnemonic devices*. The world is full of examples. For instance, in spelling, saying "There is 'a rat in sep*arate*" has helped many people remember how to spell *separate*. Students memorizing the colors of the spectrum remember the made-up name *Roy G. Biv* — red, orange, yellow, green, blue, indigo, violet. Medical students have hundreds of such devices, passed down the generations. Make up your own.

   c. Some people with a strong *sense of rhythm* recall some things by first remembering the lilt or rhythmic pattern; the words come next, and are recalled because they fit the rhythmic pattern. You might try remembering phone numbers by the patterns they make; a number such as *8646265* can be remembered by the lilt of "*eight* six *four* six *two* six *fi-i-i-ive*."

* ***Quotations from Educational Psychology, by Lee J. Cronbach.***

Remembering what you read

"I can't seem to remember enough to pass a test."
"Names give me trouble. I can't remember them."
"There are so many different items that I can't remember the prices."

Have you ever had such thoughts? At exam time, for instance, you may have difficulty remembering important facts. Why so? Why are some things more difficult to remember than others?

You *can* remember facts if you *need* to remember them and if you *want* to remember them. Your *purpose* and your *motivation* make it possible. You may not remember your teacher's name, but it is easy to remember the name of the person you met at the dance last week — or the telephone number and address. When you are motivated to remember, your purpose for remembering stands out sharply.

You can't seem to remember geography facts that don't interest you, but facts about the country you are excited about visiting next summer are easy to remember. Why? Because you have a special reason (purpose) for remembering. You are motivated. That helps you to concentrate. Increased concentration, in turn, makes the information memorable. Your purpose helps you decide what to remember because purpose directs your attention to what you want to know.

Read the following statement once only. Assume your purpose in reading it is to remember as many of the advantages of physical fitness as you can.

Physical fitness increases the efficiency of your lungs and your heart. It helps you control your weight and it is an aid in controlling emotional tension and anxiety. It also helps you to withstand physical fatigue for a longer time.

How many do you remember? Do you think you will remember longer when you know what you are looking for? Do you think you will remember the advantages of physical fitness longer if you are personally concerned about it?

Now that you see how purpose and motivation help you to remember, consider the processes that increase your ability to remember.

1. ***Associate*** **:** When you associate, you make the things you want to remember relate to one another in some way. Once you know your purpose in reading — you know what information you are looking for — you can remember this information by fitting it into a category.

   Read the following paragraph one time only. Then try to name the foods desirable for weight watchers.

   Some foods are not ideal for dieters, while others are. Lettuce, cucumbers, chicken (especially white meat), halibut, mushrooms, spinach, eggs, lean beef, liver, and melon help keep your weight down. However, rice, beans, port, butter, bread, cakes, nuts, and potatoes are high in calories and should be avoided by dieters.

   Was it difficult to answer? It might be easier if the foods were associated with general categories such as meats, vegetables, and fish. If you did have difficulty, reread the paragraph with these categories in mind.

   Read the following group of words carefully: *stove, bed, sofa, fork, lawn mower, bureau, carpet, TV set, spoon, pillow, rosebush, plate, chair, rake, bedspread, knife.*

   Now look away. How many can you recite from memory? Probably few of them. Now look at the same group of words arranged differently.

spoon	*bed*	*sofa*	*rake*
fork	*pillow*	*chair*	*lawn mower*
knife	*bedspread*	*TV*	*rosebush*
plate	*bureau*	*carpet*	*stove*

Once again, look away from the page. How many items can you recite from memory now?
At first, the words were in random order, so they were difficult to memorize. However, if you recognize that each refers to a household item and, further, if you group each item according to the area of the house in which it might be found, you have an association to help you remember. This is why the second list (divided into columns — kitchen, bedroom, living room, garden) was easier to remember.

You will find that you can understand the main idea of a paragraph, and remember it, when you relate the supporting details to it. In fact, everything you learn is learned by association. You can grasp a new idea most readily if you can associate it with some experience (vicarious or actual) you have had in the past. The new information meshes in with familiar knowledge.

2. ***Visualize*** **:** Visualization helps you create a strong, vivid memory. Picture in your mind what you wish to remember. Remember a person's name, for example, by seeing the face in your mind and associating the name with it. Remember an important date in history by picturing the scene in your mind with the date in big letters in front.
Read the following and visualize to remember how Bob and George got in a rubber life raft.

No one offered a helping hand. With each new man, the life raft sagged lower into the sea; already the water slopped over the keel from time to time. But Bob hadn't come this far for nothing. He grabbed the arm of a man already lying on the boat, and hauled himself onto the keel. Next, Assistant Cook John Collins swam up and managed to get on too. George dived out from underneath and scrambled onto the stern.

Do you see the effect?

3. ***Concentrate*** **:** People often say they cannot concentrate or they will never be able to concentrate better. Our way of life often takes away such abilities, but children are well-skilled in concentration. Why? Have you ever seen children so absorbed in playing a game, reading, daydreaming, or visualizing, that they don't hear a parent call? Punished for this, they soon learn they shouldn't concentrate as hard on what they're doing, but should gear some attention to listening for their parent's (or teacher's) call.

Concentration is focusing attention on *one thing* and eliminating thoughts of all else. Concentration involves paying attention to *one thing only.* How can you learn to concentrate better?

Visualizing will help. Visualizing forces attention to one thing only. If you try to see pictures as you read, it will help you to concentrate. *Not looking back* will also help. When you do not allow yourself to look at the text, you force yourself to concentrate to get the meaning the first time. *Making sure of your purpose* is a third way to force concentration. When you read for a purpose, you will concentrate on what you read because, as you read, you ask yourself: *Does this satisfy my purpose?*

Read the following paragraph once. Your purpose is to find out what the danger to man is.

We know now that in the early years of the twentieth century this world was being watched closely by intelligences greater than man's and yet as mortal as his own — Across an immense ethereal gulf minds that are to our minds as ours are to the beasts in the jungle, intellects vast, cool, and unsympathetic, regarded this earth with envious eyes and slowly and surely drew their plans against us.

Could you answer the question? Did you follow the procedure? Did it help you to concentrate?

4. ***Repeat*** **:** When you have difficulty remembering textbook information, repeat the procedures for associating, visualizing, and concentrating. The first step in remembering a list, for example, is to categorize it (association) then visualize it (which forces concentration). Do this once and then repeat the same task frequently. The repetition will help burn the information into your memory.

   How do you apply association, visualization, concentration, and repetition to remembering information in textbook chapters?

   - Try to understand the general outline of the chapter. Understanding how the chapter is put together provides a skeleton to which you can *associate* specific information.
   - *Visualize* as you read. Try to see pictures.
   - *Concentrate*. Try to read information one time only and then, without looking back, tell yourself what was said.
   - *Repeat* to burn details into your memory.

   Practice the skills needed for success in remembering. Do so carefully and you will take the first step toward developing a better memory.

Critical reading

All reading is done with some purpose in mind. Even pleasure reading requires some concentration. Critical reading demands particular attention so you end up with definite conclusions drawn from what you have read.

When you read a chapter in a history or science book, what is your intention? Obviously, it would be to understand thoroughly everything the author says so you can answer questions on the matter, pass a detailed examination on it, or add new facts to your store of information. This is *study-reading*. It might be called *literal comprehension*, for it involves getting the most you possibly can from the words on the printed page.

For example, some 200 years ago, Jonathan Swift wrote a fierce and bitter essay, "A Modest Proposal." In it, he suggested the poor of Ireland sell two of every three children as food for the rich and prosperous. Expressed as an economic approach to the poverty and hopelessness that afflicted most of the Irish people at the time, it was a horrifying suggestion. Was this disgusted clergyman seriously proposing cannibalism as the solution to Ireland's financial woes? Of course not, although his words lead to the shocking conclusion that the only thing left to the Irish slum dwellers and peasants, without the assistance of their masters, was to sacrifice their offspring as livestock.

Notice, however, that Swift was not offering a genuinely practical solution to the problem. He puts forth his apparent solution in a cynical and understated manner, to demonstrate the dreadful conditions of the times. So the literal meaning of the words, even when thoroughly understood, does not express the author's true and full meaning. It is left to the reader to decide Swift's intent was something quite different from what he says, and that he was demonstrating a genuine desire for the improvement of the circumstances of the Irish people.

At least one other level of reading may be recognized, literal meaning and comprehension of an author's implications.

Knowing as you do that the writer makes a proposal using words not intended to be taken literally, consider Swift's essay further. As an alert and concentrating reader, take one more step into this relationship of reader-to-author-to-reader. Move in behind the lines to decide whether the approach Swift uses is a good one. Apply what the author writes to the circumstances; make up your own mind whether the solution or analysis is accurate. You can decide if the solution is justified, it is the best possible conclusion, or you have a better explanation and resolution to offer. In this third level of reading and understanding, you not only accept the words of a writer, but you also apply them, evaluating the outcome and judging what seems wisest, most helpful, or most logical.

When you read critically, you take a more active part in this procedure. You and the author are conducting a dialog, and you are asking a great many questions about the writer and his statements. Among these questions, the following are often significant: Why did the author write this article? Was Swift personally involved, biased, or taking a nonpartisan approach? Was it timely or advantageous to him? Did he write the essay for any reader, or for a particular group? You may ask yourself: Am I included in this special group? Can I be expected to do something about it? Does Swift seek to convince me, to make me want to do something? Does he make me believe something or wish something strongly enough to demand a condition be changed?

Critical reading is a concentrated mental process requiring you to adjust your thinking and combine what you already believe and know with statements presented in print. It requires the liveliest cooperation between you and author. If the author fails to be clear or does not bother to state all the circumstances, you are prevented from full cooperation. Or if you do not give the writer your entire attention and conscientiously follow the train of thought, you cannot answer questions your mind ought to be continually asking.

Critical reading constantly provides you with new facts and thoughts and with new combinations of old and new information. With each word, phrase, fact, concept, sentence, or paragraph, the writer challenges your mind. In response, you are reacting — accepting or rejecting, assimilating or associating one idea with another, discovering that which is new or different, or discarding the useless or false.

Every reader reacts critically to what he or she reads. Critical reading is a continuous process. The more widely read and experienced the reader is, the greater is the critical capacity and judgment.

Purpose: Have a specific purpose when you read. This will help you to:

1. ***Associate:*** Relate ideas to each other.
2. ***Visualize:*** See pictures in your mind as you read.
3. ***Concentrate:*** Have a specific purpose; associate and visualize.
4. ***Repeat:*** Keep telling yourself important points; associate details with these points.

Reading strategies

1. Surveying: *Surveying provides the best possible overview in the shortest possible reading time. This special technique is derived from certain common characteristics of written communication.*

For example, with most articles the *title* usually provides the best concise indication of content. The *first paragraph* goes on to furnish the most complete orientation and foreshadowing what is coming. From that point on, major subdivisions are likely to be marked with *headings*, other important parts emphasized with *italics, heavy type, graphs*, or *tables*. More often than not, the *final paragraph* summarizes or suggests pertinent implications or applications.

Translate those characteristics into action and you will know exactly how to survey an article. You read the title, first and last paragraphs, and all headings, italicized words, graphs, and tables in between. In a sense, a survey is like a reader-made abstract, a distilling of the essence of meaning into neat capsule form.

Surveying also works with books. Here you read the *title, table of contents*, and *preface*. Then you *survey* each chapter as you would a magazine article — title, first paragraph, headings, italicized words, graphs, tables, and last paragraph or summary.

2. Skimming: *The second reading strategy to add to your repertoire is skimming — a careful reading of selected parts. It, too, is grounded on certain basic characteristics of written expression.*

Skimming is built around common characteristics of paragraph structure. For example, the bulk of our reading — an estimated 55 percent to 85 percent — is of *expository paragraphs*, where the main idea is usually expressed in a *topic sentence*. In 60 to 90 percent of such paragraphs, the *topic sentence* comes *first*, with the next more likely spot last. When the topic sentence leads off, the last sentence usually repeats or summarizes the topic idea. In addition, certain *key words* through the paragraph *supply* further *detail* and support the idea being developed. In short, as in this paragraph, reading one-fourth of the words still gives you the sentence. *Skimming capitalizes on awareness of structure*.

You can superimpose skimming on the survey technique, with its reading of title, first and last paragraphs, subheads, italicized words, graphs, and tables. All other paragraphs are skimmed. This means reading the first sentence in each one, shifting into high gear to pick up key words, then reading the last sentence. The preceding paragraph illustrates the technique, with *italics* indicating the words to be read in skimming.

Skimming is often three or four times faster than reading, depending on style and average paragraph length. A skilled skimmer often has better comprehension than a slow or average reader. Develop more skimming skill by consciously skimming at least one article every day.

To stop here, however, is to miss the important role of skimming as a reading accelerator. As you work to improve, you may actually practice fast reading 15 minutes daily, but you probably read slowly several hours daily. Skimming can be used to counteract the slowing pull of normal reading.

For example, instead of reading an important 3,000 word article at 200 words per minute, a fifteen minute task, skim it at 1,500 words per minute, then read it once at 250 WPM. This *skimming-reading combination* not only takes less time but usually means better comprehension and a distinct boost toward higher reading speeds.

3. Scanning: *Scanning serves two functions. It lets you spot certain desired information, as well as accelerate your rate. Scanning is a technique for finding a specific bit of information within a large body of printed matter. Here, you are at the highest speed. You start with such specific questions as:* Who won? When? Where?

Visualize the detail. If scanning for a date, for example, visualize exactly how it will look. Use all available clues. If scanning for a proper name, focus on the capital letter. If you are scanning for the word, *rubles*, a paragraph about Russia would help. If you want news about stock performance, the phrase, *Dow Jones average*, should lead you to the spot.

Use a systematic scanning pattern. Zigzag down the column or middle of a page — the best way to cover a page. Notice that if you look directly at the first and last words in the lines of print, you leave untapped the full perceptual span at your command. Looking as far in as the second or third word from each end should still let you see the words that come before and after. With a very narrow column, just run your eyes straight down the middle.

Scanning is particularly *useful after reading* an article when you want to fix pertinent details in mind. It can be used after reading a textbook chapter to fix important details in your mind. Increased skill will come by doing two or three scanning problems a day while reading newspapers or magazines.

4. Phrase reading: *You can teach your eyes to move faster and see more. Consider what happens when you read a line of print. Your eyes will make a series of stops or fixations as they move across the page. What is important is the number of words your eyes cover in a single pause, for it is during these hesitations that the visual impression is transmitted to your brain and interpreted.*

If you use your total eye span, you will see more words at once and get their meaning more rapidly.

Phrase reading is developed on two levels: the mechanical and the conceptual. The *mechanical* level consists of encouraging or forcing your eyes to move more quickly by looking for groups of words rather than stopping at every word. It also involves greater use of your visual span so that you become aware of larger and meaningful clusters of words or phrases.

Greater efficiency at the mechanical level contributes to more effective grasp of meaning at the understanding, or *conceptual* level. The reader begins to *lift meaning from phrases* and energy goes toward interpreting the significance of ideas and information.

How to read essays you must analyze

1. Take a pencil in hand.

2. Read the essay once over, *quickly*, looking for the main idea — for what, in general, the essay is about and for what the author seems to be saying. Don't get bogged down in details. (If you come to an unfamiliar word, circle it, but *go on reading*.)

3. Check the meaning of unfamiliar words. If they seem to be key words, that is, if the author uses them more than once, scribble a *brief definition* at the bottom of the page or at the end of the essay.

4. Now *reread*, more slowly and carefully, this time making a conscious attempt to isolate *the single most important generalization* the author makes: ***The Thesis***. Follow the line of thought; try to get some sense of structure. The thesis determines the structure. *What is the main point the author is making? Where is it?* Remember, examples or for instances are not main points.

   The thesis is the generalization the author is attempting to prove valid. Your job is to ask yourself: *What is the author trying to prove?* Another way of identifying the thesis is to ask yourself: *What is the unifying principle of this essay?* or *What idea does everything in this essay talk about?* or *Under what single main statement could all the subdivisions fit?* If the author has stated the thesis fully, clearly, and all in one place, your job is easier. The thesis may be stated somewhere in the *last few paragraphs*, in which case the preceding paragraphs gradually *lead up* to it, or else somewhere right after the introduction, in which case the balance of the essay *justifies* the statement, and *refers back* to it.

Sometimes, however, the author never states the entire thesis in so many words; it is given to you a piece at a time. Never mind. You can put it together later.

When you think you have grasped the main point — which the whole essay goes to prove — underline it and write *thesis* in the margin. If you find you have several possible theses, don't panic; they all fit together somehow. One or more will probably turn out to be *supporting* the thesis rather than part of it.

5. Now *reread for structure.* You are looking for the *main divisions* of the essay. There will (probably) be an *introduction*; draw a line clear across the page after the introduction, and write *intro* in the margin. Now tackle the *body* of the essay. You are already pretty sure what the main idea is. What are the *main points* the author makes in leading up to the thesis, or in justifying it?

   You will find, in a longer essay, that you are now dealing with *groups of paragraphs*, all having to do with the same subdivision of the main subject. *Draw lines* between the main groups and *label* them. In an essay about how to take an English final, for instance, you would undoubtedly find a group of paragraphs all of which could be labeled *preparation*, and another group that could be called *typical exam questions*. Under each group would be subgroups: under *preparation* might be *reviewing essays, memorizing terminology*, and so on.

   Occasionally you will find a paragraph that doesn't seem to accomplish much. Some paragraphs, for instance, are purely *illustrative*: the *for example* paragraph. Some are just *comments* or *digressions* by the author: the *that reminds me* type. A third very common type is the *transitional paragraph*, which just takes you rather gracefully from one point to another. When you come across a paragraph like one of these, label it in the margin.

6. Within each structural subdivision, find out what points the author is making. (*e.g.*, in the essay about the English final, find out specifically what the author says to do in order to prepare for the exam.) In other words, identify the topic sentence of each important paragraph. Underline the sentence. Note: Sometimes the topic sentence is at the *beginning* of the paragraph; sometimes at the *end*; sometimes the topic is not stated but is only *implied*.

7. You now have the skeleton of the argument and should be able to follow the reasoning. If you are still having trouble, try scribbling a word or two in the margins, summing up the paragraphs — as if you were annotating a textbook. In the essay about the English final, for instance, you might write *mark up textbooks* in the margin after one paragraph, and *but not too much* after the next. You can also underline *key transitional* or *structural words* or *phrases* like: *but, however, moreover, on the other hand, nevertheless.*

8. Write, at the beginning or end of the essay, a *thesis statement* for the essay. Remember, the thesis *sums up* the focus of the essay. If you had one sentence in which to explain this author's main point (and possibly the main proofs used), how would you say it?

9. Finally, and very important, consider two other questions: *why* did the author write this, and *for whom* ? What was the guiding purpose? What audience was in mind? What assumptions were made; that is, what did the author take for granted the audience already knew, or already believed, or both? Is the audience hostile or friendly?

   The essay about passing the English final could be addressed to first-year students worried mainly about how to answer specific questions, or it could be addressed mainly to those concerned with how to review for the exam. The essayist could take for granted the reader knew the meaning of key terminology — unity, coherence, emphasis — or could assume everything had to be explained from scratch.

10. If you know you are to be examined on the rhetorical techniques the author uses, now is the point to go on a deliberate hunt for them — after you have thoroughly understood the essay.

Suggestions for improving reading speed

Almost anyone can double their reading speed while maintaining equal or higher comprehension. Anyone can improve their speed to get what is wanted from the reading.

The average college student reads between 250 and 350 words per minute on fiction and non-technical materials. A good reading speed is around *500 to 700 words per minute*, but some people can read 1,000 words per minute or even faster. What makes the difference? Three main conditions improve reading speed: (1) *desire to improve*; (2) *willingness to try new techniques*; and (3) *motivation to practice*.

Learning to read rapidly and well presupposes your having the necessary vocabulary and comprehension skills. When you have advanced on the reading comprehension materials to a level at which you can understand college-level materials, you will be ready to begin speed-reading practice in earnest.

Most adults are able to increase their rate of reading considerably and rather quickly without lowering comprehension. These same individuals seldom show an increase in comprehension when they reduce their rate. In some cases, comprehension is actually better at higher rates of speed. Such results, however, are heavily dependent upon the method used to gain the increased rate. Simply reading more rapidly without improving basic reading habits usually results in lowered comprehension.

Some of the factors which reduce reading rate are: (a) *limited perceptual span* (word-by-word reading); (b) *slow perceptual reaction time* (slow recognition and response to the material, perhaps including slow or inaccurate interfixation movement); (c) *vocalization* (whether peripheral, latent, or cortical, including the need to vocalize in order to achieve comprehension); (d) *faulty eye movements* (including inaccuracy in placement on the page, in return sweep, in rhythm and regularity of movement, and so forth); (e) *regression* (both habitual and as associated with habits of concentration); (f) *faulty habits of attention and concentration* (beginning with simple inattention during the reading act and faulty processes of retention); (g) *lack of practice in reading* (due simply to the person reading very little and having limited reading interests, so that little reading is practiced in the daily or weekly schedule); (h) *fear of losing comprehension* (causing the person to suppress the rate in the belief that comprehension is improved if more time is spent on the individual words); (i) *habitual slow reading* (in which the person cannot read faster because he or she has always read slowly); (j) *poor evaluation* (of those aspects that are important and unimportant); and (k) *trying to remember everything* (rather than to remember selectively).

These conditions reduce comprehension. Eliminating them is likely to increase comprehension. This is entirely different from simply speeding up the rate of reading without changing the conditions responsible for the slow rate. In fact, simply speeding the rate through forced acceleration often results in making the real reading problem more severe. In addition, forced acceleration may even destroy confidence in ability to read. The solution is to increase the rate as a part of a total improvement of the whole reading process. This is a function of *special training programs* in reading.

A well-planned program provides the necessary conditions for you to maximize your reading abilities. Four basic conditions include:

a. ***Have your eyes checked.*** Often very slow reading is related to uncorrected eye defects. Before embarking on a speed-reading program, make sure any correctable eye defects are taken care of by your eye doctor.

b. ***Eliminate the habit of pronouncing words as you read.*** If you sound out words in your throat or whisper them, you can read silently only as fast as you can read aloud. You should be able to read most materials at least two or three times faster silently than orally. If you are aware of *sounding out* or *hearing* words as you read, try to concentrate on *key words* and *meaningful ideas* as you force yourself to read faster.

c. ***Avoid regressing* (rereading).** The average student reading at 250 words per minute regresses or rereads about 20 times per page. Rereading words and phrases is a habit which will slow your reading speed down to a snail's pace. Because the ideas you want are usually explained and elaborated more fully in later contexts, it is unnecessary to read words. Furthermore, the slowest reader usually regresses most frequently; and because of reading so slowly, the mind has time to wander. Rereading reflects an inability to concentrate and a lack of confidence in comprehension skills.

d. ***Develop a wider eye span.*** This will help you read more than one word at a glance; and since written material is less meaningful if read word-by-word, this will help you learn to read by *phrases* or *thought-units*.

Poor results are inevitable if the reader attempts to use the same rate indiscriminately for all material and for all reading purposes. You must learn to *adjust the rate to the purpose* in reading and to the *difficulty of the material*.

Overall rate adjustment should be based on your reading plan, your reading purpose, and the nature and difficulty of the material. To understand general ideas, read fairly rapidly; to get and retain detailed facts, read at a more moderate rate; to locate specific information, skim or scan at a rapid rate; to determine value of material or to read for enjoyment, read rapidly or slowly according to your feeling; to read analytically, read at a moderate pace to permit inter-relating ideas. The nature and difficulty of the material requires adjusting your rate to your ability to handle the material.

Level of difficulty is highly relative to the particular reader. While Albert Einstein's theories may be extremely difficult to most laypersons, the same theories may be simple and clear to a professor of physics. Hence the layperson and the physics professor make different rate adjustments in reading the same material.

Internal rate adjustment involves selecting differing rates for parts of a given article. In general, *decrease speed* when you find the following: (1) *unfamiliar terminology not clear in context* — try to understand it in context at that point; otherwise read on and return to it later; (2) *difficult sentence and paragraph structure* — slow down enough to enable you to untangle them and get an accurate context for the passage; (3) *unfamiliar or abstract concepts* — look for applications or examples of your own as well as studying those of the writer; take enough time to get them clearly in mind; (4) *detailed, technical material* — including complicated directions, statements of difficult principles, materials on which you have scant background; (5) *material you want to retain in detail*.

In general, increase speed when you meet the following: (1) *simple material with few ideas that are new to you* — move rapidly over the familiar ones; spend most of your time on the few unfamiliar ideas; (2) *unnecessary examples and illustrations* — since these are included to clarify ideas, move over them rapidly when they are not needed; (3) *detailed explanation and idea elaborations you do not need*; (4) *broad, generalized ideas and ideas that are restatements of previous ones* — these can be readily grasped, even with scan techniques.

Keep your reading attack flexible; adjust your rate sensitively from article to article. It is equally important to adjust your rate within a given article. Practice these techniques until a flexible reading rate becomes second nature to you.

In summary, evidence indicates a need for a rapid reading rate. At the same time, the dangers of speed in reading, as such, should be avoided. A relationship exists between reading rate and comprehension. You should also adjust your reading rate, along with the whole reading attack, to the material and your purposes. Finally, as a part of an overall reading training program, an increase in rate should come in conjunction with the elimination of conditions that reduce reading rate.

Rapid-reading techniques

Not for math or engineering; probably not for poetry, physics, or philosophy either.

1. *Phrase reading* (350-650 wpm): best rapid-reading technique for texts and for comprehension. Involves stopping — focusing — once for each phrase instead of each word. You should gradually increase the width of your eye span — increase the number of words you can see in a stop — and decrease the amount of subvocalizing you do. Use clustering or phrasing on wide-columned magazines until you are reading comfortably — then try it on fiction. Last of all, try it on texts but *only* in conjunction with prereading and questioning or mental summarizing.

To reduce subvocalizing, try (a) moving your eyes as quickly from phrase to phrase as you normally do from word to word; (b) temporarily clenching your teeth tightly while reading; (c) chewing gum while reading; or (d) counting numbers silently, but *only* when rereading something you've already clustered. (You may never eliminate subvocalizing completely.)

2. *Sweep reading* (400-900 wpm): faster than phrase-reading, but usually comprehension isn't as good. Eyes sweep straight across lines, stopping at ends of sentences. Good for light fiction and nonfiction, magazines, and some texts. You can use your hand as a pacer, moving *under* the lines.
Moving your hand as *quickly as possible* will decrease subvocalizing. Try combining sweep-reading with phrase-reading on the more important parts (introduction, topic sentences, summary, basic dialogue, and so forth)

3. *Vertical reading* — and *key-word reading* (500-1500 wpm)**:** the fastest. Only for narrow columns (maximum 6-7 words per line) like newspapers and some magazines. Read headlines and first paragraph carefully. Read down the middle, not across lines. A swirling movement works better than reading straight down. Vertical reading can be helpful in widening your eye span, by forcing you to use more of your peripheral vision. To begin, try starting with a broad swirling movement, changing gradually to a narrower swirling movement.

4. *Space reading* (375-750 wpm): also faster than phrase-reading, but comprehension is not as good. Involves two stops per line (1/3 and 2/3s the way across) on magazines, or three stops per line (1/4, 1/2, and 3/4s the way across) on books. Probably not good for texts unless you combine it with phrase reading. To do this you will fix first and last stops roughly 1/2" into the text from the margins (possibly drawing lines to begin with). Other stops will vary according to punctuation, grammar, and so on.

How to calculate your rate

Self-pacing

First, read five pages of text to get a good average, then record the time. Second, count the number of words you have read. Third, multiply Y times the the number of words to get your rate per minute.

If your reading time is X; multiply Y by the number of words read to get WPM (words per minute).

	X		Y	X		Y
seconds	10	–	6.0	65	–	.9
	12	–	5.0	70	–	.85
	15	–	4.0	75	–	.8
	20	–	3.0	80	–	.75
	25	–	2.5	85	–	.7
	30	–	2.0	90	–	.67
	35	–	1.7	95	–	.65
	40	–	1.5	100	–	.6
	45	–	1.3	105	–	.57
	50	–	1.2	110	–	.55
	55	–	1.1	115	–	.52

It's essential to check your rate occasionally — every few weeks or months. Always check comprehension by summarizing, structuring, mapping, outlining, reciting, or answering questions.

* Note: 100 seconds for X would give a value of 60.0 for Y, a value of 120 seconds for X would give a value of 50.0 for Y, and so forth.

V. Write right — make it easy on yourself

Writing can be painless

How many times have you sat down to write and found it difficult to get the words on paper? You knew what you wanted to say, but what you wrote just didn't look right. And now you dread writing assignments because you had so much trouble getting started in the past. Sometimes writing a paper is a painful, frustrating process, but it need not be.

When you sit down to write, you have thoughts on your mind. However, you may block yourself and fail to get all of those thoughts down on paper — if you try to write every sentence correctly the first time.

You are being unfair to yourself if you try to get everything right the first time. Your mind does not function that way. *Thoughts come in bits and pieces, and that is the way you have to write them down on paper.* If you worry over punctuation, misspelled words and sentence structure, your attention shifts from *what* you want to say to *how* you want to say it. Those good ideas may drift away. You may not be able to recapture them.

A simple, but effective, process will help to make writing less painful. The process requires, first, that you *allow yourself enough time* to write your paper. A well-written paper is developed in stages. The paper must be carefully *planned, organized, written, proofread,* and *rewritten*, perhaps several times.

Second, you must be willing to *put your mind to work*. Think about what you want to say, for a few hours or even a few days if possible, before you write anything down on paper. Analyze concepts, facts, definitions, ideas, and your own opinions. Fit things together so they make sense to you. Do *not* attempt to write until you have spent some time thinking. Remember: *Think, don't procrastinate!*

Before you begin writing, be sure you *have a plan* to keep you on target and help you organize your paper. The plan may be:

(1) several carefully thought-out ideas, tucked away in your mind;
(2) some casual notes to jog your memory;
(3) a topic outline consisting of single words or brief phrases;
(4) a complete sentence outline.

The important thing is that you have a sense of direction before you start writing.
Now *begin the writing process*.

Stage 1: You will need several sheets of scratch paper, one sheet for each main idea you want to develop. Write one main idea across the top of each sheet of paper.

You are ready to brainstorm. Follow your mind. It might lead you to begin with *idea C* instead of *idea A*. It does not matter at this stage. Later, you will organize and connect the various parts so smooth transition is made from one section to another.

Write down your thoughts about each main idea. If you are not sure about spelling, write *sp* over the word. *Circle* words that seem out of place, and just keep on writing. Do not block thoughts; let them flow. If you are writing about *A*, and thoughts about *B* keep trying to push through, put aside *A* and begin writing on *B*. Get those thoughts down; later, go back to *A*, if necessary.

Continue this brainstorming process until you have written down all of your thoughts. Then put the paper aside. You need time to get away from it and think about something else. How long you stay away depends on the assignment and the amount of time you have allowed yourself to write the paper.

Stage 2: You are ready to write the first draft. At this stage, you begin to put order into your paper. Start with *main idea* (section) *A* and move from *A* to *B*, *B* to *C*, and so forth. As needed, develop, revise, or rewrite your original statements. Use complete sentences, pay attention to paragraph development, and use your dictionary. Pay attention to transitional phrases as you move from one section to another.

Stage 3: It is now time to put yourself in the reader's place. Read the paper with the following questions in mind:

- Has the paper been developed according to the original plan or outline?
- Does the paper contain all of the information suggested in the title?
- Does it contain unnecessary or unrelated information?
- Is transition smooth throughout the paper?

It is quite helpful to read aloud, especially those statements that seem unclear. Revise and rewrite until you are satisfied you have effectively written everything you wanted to say.

Stage 4: Proofread your paper for spelling, punctuation, and grammar. If you are not sure about errors, have someone proofread the paper before it is typed or written the final time. Consult a *writer's guide*, as needed, for correct format and footnote and bibliographic format. Allow ample time to write or type your paper. The final preparation can add to or detract from its quality. Proofread again before you turn in the paper. Neatness and accuracy do make a difference. Remember your paper represents you and the grade you will get in the class.

Prepared by Mattie T. Evans, Learning Skill Specialist, Learning Assistance Center. December, 1976.

* If you haven't already invested in a computer system, consider doing so now. Using a computer system as a writing tool can help you in your studies and your career. For one thing, modern word-processing programs can correct spelling and grammar errors. And when you need to revise papers and other program functions (document duplicating, cut-and-paste, etc.) can save you significant time. Most schools have computer labs — check out the resources available at your school. The more experience you gain with computers in school, the more effective you will later be in your job.

Writing a research paper

Planning the research

A. Select a subject.

1. You might be assigned a specific topic or a general idea.
2. Be sure you understand the limits of the assignment such as time, length, and resources.
3. Understand the limits of resources available to you: Does your library have the needed information? Do you need to conduct interviews? Do you need to distribute a questionnaire?

B. Narrow the subject into a specific topic.

1. Remember space and time limitations.
2. Use the encyclopedia to help you.

C. State the objective: What point do you want to make? Do you want to prove or disprove something? Do you want to demonstrate something?

1. The statement of the objective is called the *thesis*, the main idea of the entire paper.
2. Your thesis should be *supported by facts* in argument for or against a *disputable* idea.
3. Ask yourself the basics: Who, what, where, why, when, and how?

Doing the research

A. Write a preliminary bibliography locating information in:

1. The card catalog
2. The Reader's Guide

B. Write the information on 3x5 cards, one card per book or article.

C. Prepare a working outline.

D. Take notes on 3x5 cards, one per idea.

Writing the paper

A. *Outline* the paper.

Rearrange the 3x5 cards with your ideas on them and prepare a detailed outline. Your outline can be in different formats:

1. *chronological order* — by time sequence — step-by-step procedure
2. *comparison*
3. *examples*

B. Write the draft.

1. **The introduction — includes:**
   a. presentation of the idea
   b. attention-getting statement
   c. statement of thesis

2. **The body of your paper — includes:**
   a. developing the main ideas
   b. developing supporting ideas

3. **The conclusion — includes:**
   a. summary of the main ideas
   b. restatement of the thesis

4. **Revise the first draft.**
   a. Check content and organization.
   b. Check transitions, from one idea to the next. Make sure all transitions are smooth.

5. **Prepare the final paper.**
   a. Check format, title page, footnotes, bibliography.
   b. Type paper in approved format.

Some steps to follow for composing a well-written paper

1. **Be organized in your work!**

2. **Write an outline.** An outline may help you:
   a. narrow and define the scope of your paper.
   b. organize scattered and disoriented thoughts.

3. **Define your topic.**
   a. It helps you avoid drifting from your subject.
   b. Know exactly what your professor expects — misinterpretation may cause you to receive an unsatisfactory grade. Periodically consult your professor about the development of your paper.
   c. Choose your topic with regard to your audience and the person grading your paper. Be sophisticated, remember you are writing for a university professor and not a high school teacher.

4. ***Prepare data* for your term paper.**
   a. On 3x5 cards, write *one* piece of information per note card.
   b. On the *reverse side*, note the page on which that information was found.
   c. On a separate piece of paper, *list* — and alphabetize — all sources with all information needed for your bibliography.
   d. On the reverse of the 3x5 card, note the source by writing the appropriate letter of the alphabet for easy reference and to help you with *footnotes* and a *bibliography*.
   e. When you finish researching, organize your cards into bundles that represent single ideas. To organize the bundles, refer to your outline.

5. **Write well-conceived sentences to construct a good paragraph and in turn, a good paper.**
   a. If your paper can be more easily read by dividing it into segments — do it! (primarily for term papers, not short essays)
   b. The first and last sentences of each paragraph have specific functions; therefore, properly introduce and conclude each paragraph.
   c. Unless you are purposefully using questions, rephrase them as statements.
   d. Do not try to fool the professor; it does not work! Write sentences that give information of researched interpretation.
   e. Don't avoid the issue. Attack it. You must carefully choose the manner in which to present the paper. Research your topic completely, and construct an argument to support the validity of your paper.

6. Research the topic.

a. To feel comfortable with your topic and to more effectively discuss it in your paper, research accurately and completely.
b. Never make unresearched conjectures, unless your instructor requires you to do so.
c. Allot enough time to research the paper adequately, and enough time to write it.

7. Be sure your paper has content.

a. Do not give your professor a paper full of facts and nothing else, or a paper concerned exclusively with opinion — discuss and interpret the facts; support your argument (premise).
b. Don't be opinionated or selective — consult a variety of informational mediums (books, periodicals, newspapers, and others) and use a number of sources within each medium.

8. Make your paper stand out.

a. Your professor must review other papers; help your professor to remember *your* paper —and you — by preparing an interesting and informative paper.
b. Don't be too repetitious: Vary the length of your sentences, paragraphs, and structure (with reference to style, not basic form). Use a good cross-section of vocabulary.
c. Avoid ambiguous terms or clichés.
d. Strive for maximum content in a minimum of space. Review. Rewrite. Improve.
e. Prepare a title page, and if needed, a table of contents.
f. Type your paper.

9. Check your paper for typing, grammatical, and mechanical errors.
(If you need help with this, or any other step, get assistance.)

Two additional steps are necessary for you to be a more proficient writer: *Continue to read and write* (over and over); it will improve the quality of your written work — your paper.

1. Reading enables you to draw from other resources (authors) and styles. The more writing styles you expose yourself to, the more sophisticated your writing will become; reading can do this for you.

2. Writing is a skill; to refine that skill, you must seek to improve your capabilities. You *must* practice writing. You must continue to compose papers to improve your capabilities. Furthermore, to refine your skill at writing and to improve the quality of your paper, always rewrite original compositions.

How to write a paper

***Step 1:* Understand the assignment**

1. Length?
2. Special directions or requirements?
3. Free topic choice, or assigned?
4. Informative? Persuasive? Other?
5. Terminology not clear?
6. Library research needed? How much?
7. Bibliography required?
8. Can you break the assignment into parts?
9. When will you do each part?

Step 2: **Select a topic**

1. Find a topic which:
   - interests you
   - you know something about
   - you can research easily
2. Brainstorm and write out topics.
3. Select specific topic from brainstorming list.
4. In a sentence or short paragraph describe what you think your paper is about.

Step 3: Do your initial planning & investigation
Write down:

1. The nature of your audience
2. Ideas and information you already possess
3. Sources you can consult
4. Background reading you should do

Step 4: **Make a tentative outline** (main headings only)
Make a research guide to keep you on the subject while you work. For example:

How to write a paper
- Understand the assignment
- Select a topic
- Do your initial planning and investigation
- Make a tentative outline (main headings)

Step 5: **Accumulate research materials**

1. Use 3x5 index cards.
2. Make bibliography cards first.
3. Do note cards next (one idea per card — direct quotations, paraphrases, your own ideas).
4. Organize note cards under main headings of tentative outline.

Step 6: **Make a final writing guide**

1. Reorganize and fill in tentative outline.
2. Organize note cards to correspond to outline.

Step 7: **Write the paper**

1. Use outline to guide you.
2. Write fast — capture flow of ideas — deal with proofreading problems later.
3. Put aside overnight or longer, if possible.

Step 8: **Revise and proofread**

1. Check organization — reorganize paragraphs and add transitions where necessary.
2. Rework introduction and conclusion.
3. Work on sentences — check spelling, punctuation, word choice, and so forth.
4. Read out loud for final check.
5. Type or rewrite in manuscript form.
6. Hand in to professor.

VI. Using specialized skills

Looking at tests

Taking tests involves more than simply preparing, thinking, and writing. The good student begins to prepare for testing the first day in the classroom and continues the attack on the test after it is over and the marks are in. Some periods of preparing for exams may be more intense than others. At times, a student will be forced to hurry to make up for unfinished work.

However, sooner or later, usually after some difficult experiences, many students begin to profit by following certain important steps:

1. Begin preparing at the beginning of the course, and do your work daily. Don't get behind. *Get ahead* and stay there.

2. *Understand* what you do. It's difficult to learn nonsense and remember it.

3. *Review* intelligently. Set aside a regular part of your study period for reviewing earlier material. You forget rapidly but relearn easily. Work logically. Review your notes and your returned papers. Do not skip over any part of your work, put it off, or take it for granted. If you really understand parts of your work, don't waste time on those parts. However, don't fool yourself into thinking you understand something when you really don't. Be sure you can tell it to someone so they understand, or be able to write it down so it makes sense.

4. *Test* yourself before the teacher does. Get ready for what's coming. Don't be surprised. After you have done your work on your own, work with others. This isn't charity. It makes sense because the one who is teaching inevitably learns more than the student. Look at the material from what you think might be the teacher's point of view. If you were teaching the same class, what questions would you ask? Often students try to outguess the teacher and to spot questions. A practice of long standing, this represents a valuable and practical technique. However, don't rely on it to get you through exams. The teacher wants to cover certain material; and questions will be answered on the teacher's terms, not the student's. Although you may make up a mock exam, you should include most of the course material in it. Your teacher will probably include it in the exam.

5. Come to the exam with a sharp mind not dulled by too much last-minute studying. Be sure you bring to the exam all the materials you need so you are ready to work when you receive the test.

How to read an exam

1. *Skim* the entire exam first to get an idea of what is being asked, and how the test is organized.

2. *Understand* the format.

3. *Question* the items when you aren't sure what's being asked.

4. *Budget* your time according to the point value of each section. (A question worth 10 percent should receive 10 percent of your time.)

5. *Establish priorities:*
   a. Answer easy items first.
   b. Answer difficult items last.

6. *Begin work.* Read each item thoughtfully, in relation to the course.

7. *Reread* what you have done.
   a. Make changes or additions as neccessary.
   b. Be sure you have answered all of the items as logically as possible.

8. *Guess* at all items you aren't sure of.

Studying the teacher

The teacher is the one who selects your course textbooks and other readings, writes the lectures, makes up the examinations, and gives the grades. Common sense dictates that the student should also study the teacher, as well as the assignments and lectures.

The better you read the instructor, the better you can understand what the instructor is trying to teach. And it is the student's business to learn what the instructor is teaching. To do otherwise is to miss the whole point of attending class. This is not to say you can't go beyond course content as the teacher sees it, but the first step — understanding what the instructor has decided is essential — must come first.

Which of the teacher's likes and dislikes might affect your grades, how you study, and how you work in class? Which political, economic, social, or other views might affect the emphasis and content of exams? Are students allowed to be original or express opposing viewpoints? Has the teacher written any books or articles, or given any speeches recently? What offices does he or she hold in professional organizations?

We're not talking about subservience, simply realism. If you can put on a good face for someone whose opinion is important to you — be it friend, lover, or employer — why not teacher? Surprisingly, some students seem to deliberately go the other way, doing everything possible to antagonize instructors.

A more sensible approach pays off, producing positive results in terms of exam scores and course grades. Since it tends to make the student more responsive to what is being taught, it also increases learning.

So how do you learn about teachers? The school catalog or some other publication will list university studies and degrees. Look in *Who's Who* for biographies appropriate to their fields. The periodical indexes will list articles, and the library card catalog will refer you to books authored by your instructors. Read what they have written — chances are strong the basic slant will carry over into the classes.

The best sources of information, however, are the teachers. Listen to what they say in class or during conferences. You will find them giving you many hints about what they think is unimportant or important, wise or foolish. The number of times they repeat something provides a rough gauge of how important they consider it to be. It isn't unreasonable when a teacher states an opinion or preference, to jot it in your notes — and use the information subtly to your later advantage.

Students who have already taken a teacher's course can probably add to your stock of information. Beware, however, of accepting their judgment over your own. Many a teacher portrayed as an ogre turn out to be inspiring to others. When a fellow student tells you a teacher is great, try to determine what being *great* involves. Some *good guys* earn their students' affection at the expense of their education, and teachers who pile it on are not necessarily your enemies.

Social sciences

The social sciences offer a varied choice for your six required units. Consider the offerings carefully. You may choose a particular aspect or period in history; you may choose the many sociology courses or psychology courses; or you may take the general social science course sequence. Your important consideration should be the subject and the teacher, *not* time preference. Ask: *What is my need? My interest? What aspect of the social sciences do I want to study in depth now? What do I want from the class? From the teacher?*

Also, consider the types of classes. If you dislike the 50-minute class or want more coordination and integration in your education, try the combined or block classes. If you want to be part of a group all semester through several courses, take the block courses. Would you prefer a big lecture class? Small seminar class? Do you want intellectual challenge? Then find a teacher who will make hard work worthwhile.

Some general tips

1. Find out your teacher's ground rules regarding attendance, make-up work, tests, assignments, and other expectations. Choose instructors whose ground rules you find compatible with your learning style.

2. Many teachers will accept a well-chosen and thought-out substitute assignment. If you are not pleased with the teacher's plans, work out a project, select related books you would rather read, or prepare a plan for a research project, and approach the teacher. Chances are your choice will be acceptable, so long as you don't seem to be trying to get out of work or to make more work for the teacher.

3. Should you have difficulty with the readings or any assignment, talk to the teacher after class or make an appointment to see the teacher. Do this immediately — before thoughts about dropping out enter your mind. Don't put it off until its too late to redeem yourself.

4. Buy a *loose-leaf binder* for your class notes and handouts. Review your notes after class and keep them up-to-date. If you miss class, get notes or reprints from classmates or the instructor.

Reading the social sciences

The social sciences use (1) basic textbooks and (2) interpretive and argumentative books.

Be prepared for an active dialog in reading social science materials. Social science authors often are trying to get you to see, to share, to believe, and to do something about the subject they are writing about. You must always question and compare your own feelings, opinions, and position about the subject with those of the author. Every social science book — including textbooks — has opinion and interpretation written into it — the author's interpretation or those of other social scientists. There is no way that one can write an objective social science book. Therefore, the material includes biases, feelings, beliefs and viewpoints of the authors—how they feel about the structure of American society and lifestyles, and what their social or political interests are.

Try to keep separate (1) what the author's main ideas are and (2) how you feel about them. Try to glean the general statements or principles from the data, examples, or facts.

1. Note title and subtitle of your books, as well as the information it covers.

2. Read the *preface* and *introduction* of your texts. Here authors tell you what they feel and believe about the subject, issue, or problem. *Search out:*
   - What is the argument or controversy?
   - Who are they arguing against? (Established views in the field?)
   - What are the authors' politics? Where are their heads at?
   - Where do they come from? Background? Experience?
   - What conclusions or solutions about the problem do they offer?

3. Look over the *table of contents*. Note what topics are going to be covered. Note *chapter titles*.

4. Note title and subtitle of each chapter. Often they are capsules of what the chapter is about. Notice the key terms in these titles; these terms will appear and reappear. You will pick up specialized definitions as you delve into the reading.

5. Read each chapter's introductory paragraphs slowly and thoughtfully. The problem, issue, controversy or subject, and what the authors want to say about it will be stated here in a general statement. *Readings* textbooks frequently have a summarized preface or abstract — often in italics — following the title. These contain a gold mine of information and are worth a second reading. Proceed with the chapter reading, keeping this information foremost in mind.

6. Note subheadings or sections within a chapter. These reflect some internal logic in the argument. Ask: *Why a new section? What new aspect is being presented now?*

7. Usually the first sentence in a paragraph is the idea sentence, or it appears very near the beginning. Then follow the explanation, evidence, proof, reasons, examples, and so forth. Grasp the main-idea sentence so you won't get lost in the details. The content of the social sciences is not the individual facts, but their synthesis into *ideas*. You can lose these ideas in the many factual details and examples used to back up what the author is saying. Pick up the juicy and important facts when you discuss the main ideas.

8. In sentences, note carefully these significant clues:
   - What I want to show is...
   - My belief is that...
   - The basic assumptions underlying this analysis will be...
9. Mark in your notes or in your book in your own personal way what you want to ask about in class — even if the teachers do not call for questions. If you ask, they'll answer!

10. Summarize in your own words what is being said in each section; this usually involves the key words in the section heading. Jot this down in the margin. This is better than underlining.

Vocabulary

Quickly learn the teacher's jargon and the jargon of the social sciences. Meaning of common words are often specialized. Learn the definitions offered by your texts and emphasized by your instructor. Note especially which of many meanings apply to such terms as culture, myth, self, and so on. It is important to have a clear understanding of key terms and concepts, not a vague definition. Use flash cards.

Notes

1. Take lecture notes in social science classes, especially if the instructor does not use a central textbook. Review these notes at the end of the day — certainly before the next class.

2. Yes, you can learn to listen and take notes at the same time. In fact, taking notes can help you listen better.

3. Take as much down as you can at first; it is hard to determine what you are supposed to remember until the first test. Then you can better select what the teacher thinks is essential and important.

4. Put down the main ideas and some important details for each. You can tell main ideas as instructors tend to repeat them in varied form, discuss them at length, or set you up for them with such openers as, "You may not agree with me, but I feel strongly…" or "I think…." Some teachers may give you the important ideas at the beginning of the class, others at the end in the last few minutes — so hold on!

How to study history

A. Some general considerations

1. Buy the required texts immediately, preferably clean copies so you won't be distracted or confused by someone else's markings and comments which may not be consistent with yours.

2. Go to class regularly.

3. Read the assignment. Take brief notes — one sheet (with notes in two columns) per chapter is often sufficient. Review notes upon completion. Read notes aloud to reinforce learning.

4. As the instructor stresses and emphasizes certain points, mark your notes accordingly for test study later.

5. From collateral readings, extract only the essential and important points. Purchase your own copies of optional reading if possible, as it is often difficult to obtain them from the library in time for the test or report.

6. Reduce your test study to the reviewing of notes. Start this general review when the test is first announced, which is usually a week or so before the actual test date. Get a good night's sleep the night before the test. If you do not find it distracting, review your notes once again the morning of the test.

7. Take every test!

8. Meet all other assignments and requirements on time.

9. History instructors use many approaches; they vary in their points of view and emphasis; what is important to one instructor may not be to another. Determine what your instructor wants, what his approach is, and what his emphasis is. You should be able to tell within a week or so. Find out what your options are, and choose the class that best meets your needs and interests.

A history text is the work of a creative imagination. The author attempts to recreate the life, thoughts of, and events surrounding particular persons, or to trace the movement or development of ideas or events which have had significant effects. The selection of facts reflects the author's belief as to what happened. Establishing casual relationships between facts, the historian presents an account of why some event took place and the consequences of it. Not simply a reporter, he or she draws conclusions from a body of selected facts, develops opinions, and makes judgments on them. This demands close and careful reading on your part — questioning, analyzing, relating, synthesizing, and evaluating a subjective version of history.

B. Reading the text

When you first buy the text, spend some time looking it over from front cover to the back. Note title, author, publisher, copyright date. Study the table of contents, tracing the movement or organization of the material. Where does it begin? What does it cover? Where does it end? Read the *preface* or *foreword* and *introduction*. Here you will find what the author's position, emphasis, and intentions are. Notice the level of writing and its style. Is it easy to understand? Difficult? Impossible? Make arrangements to get help right away if you find the text difficult. Skim through the first chapter noting arrangement of the material. Are there headings to guide you? Are passages generally long or short? Longer passages demand more persistence. Note pictures and illustrations. Is the print easily readable?

Sample a few paragraphs. Where are the topic — main idea — sentences? Are the supporting sentences heavily modified with phrases and dependent clauses? What other aids do you notice that could help you get through the chapter? A summary? Questions at the end of the chapter? A glossary? Bibliography?

C. A few points on reading historical prose

1. If the sentence is long, difficult, or confusing, resort to good old grammar. What is the sentence about — its *subject*? What does the author say about the subject — its *predicate*? All else complements and modifies — adds, subtracts, limits or qualifies the subject and predicate in some way. Reason through these qualifying parts, and you'll come up with understanding.

2. Recognize and trace trends, developments, and movements of ideas or events. This is the underside of a large wave. The details represent the surface of the wave, which changes often. Keep in mind the more significant and larger design.

3. Visualize and dramatize events and personalities in your mind. Be your own movie director and direct the event as it happened. This may be an amusing way to get involved. It does develop a vivid impression on the mind.

4. Relate as much as you can to current events, personalities, and ideas.

5. For the chapter as a whole, for subparts, or for paragraphs, common patterns of historical prose are:

a. cause and effect — or implications, consequences. Every major event in history comes about as the result of some cause or set of causes. Sometimes the effect of one event becomes the cause of another event. The consequences or effects have political, social, or economic implications.

b. sequence or chronology of events.

c. detailed statements of facts.

d. comparisons, analogies, or contrasts.

6. Be open to many versions of history, even differences in point of view and approach among your instructors. You are richer for gaining more than one version.

7. If you are having difficulty with any portion of it, seek novels and biographies. Almost every phase of history has inspired some fictional efforts. You often get a better feel for the temper of the times, life of the times, and the event in story form. You also get the story of a political leader in more vivid and dramatic form.

8. Read always with a *questioning* mind and *search* for answers.

9. Study maps, charts, and other illustrations for the significant information inherent in the book.

D. Vocabulary

You will develop two vocabularies as you read your text. One will consist of common vocabulary words you may not have seen or mastered in other readings. The other will be a specialized vocabulary of historical terms and concepts.

Common vocabulary:

Every author and instructor has a favorite body of verbs, nouns, adjectives, and adverbs you will read and hear frequently. At the onset, take time to master them.

Words have multiple meanings. Gather the meaning of words from the sentences in which they appear. Each sentence or verbal context fixes and limits the meaning intended and eliminates misunderstanding. If the meaning is not clear from the verbal context, look the word up. Be sure to choose the meaning that fits the context. Master these words immediately and more easily through vocabulary flash cards.

Historical terms and concepts:

For these, you will find an extended definition and elaboration through examples and analysis. Certainly the instructor will define it and expand on it. Check your understanding of the term or concept with the instructor's. As these are the building blocks of the text, they must be understood clearly.

How to study chemistry (preorganic chemistry study guide)

Karriem H. Ali

Stanford Medical School, 1986

Any time you spend on organic chemistry during the summer would probably best be spent on *structure*, *nomenclature*, and *stereoisomerism*, fundamentals of organic chemistry that will come up throughout the year.

A. Problems

Confronted by an array of unfamiliar and sometimes extremely difficult material, you will at times find yourself wondering how you are going to get anything out of it all; but the key to most of the problems in chemistry lies in the problems themselves. **The importance of problem-solving cannot be overemphasized.** Not only do the problems illustrate some of the facts and principles that are being presented but they also test your understanding. So work as many problems as you can find. You'll find this to be a rather effective method of acquiring what could be called *chemical intuition*. Also, study with a pencil in your hand, writing things down on paper helps to write them down in your mind; so waste some paper when you study.

1. Draw and name all *structural isomers* consistent with the molecular formula, C_8H_{18} (IUPAC rules for naming alkanes can be found in textbooks).

2. Draw and name all structural isomers of C_5H_{10} (with C-C single bonds only).

3. Write structures for the following compounds:
   a. 3, 5-diethyl-4-isopropyloctane
   b. *trans*-1, 3-dimethylcyclopentane
   c. 1, 4-dicyclopropylbutane
   d. 4-methyl-3, 3-diethyl-6-isopropyloctane
   e. 3, 4-dimethyl-4-ethylheptane
   f. 7, 7-dimethyl-2-tert-butyl-decane

4. Isomers having the same *constitution* (the same sequence and nature of bonding), but differing in the spatial arrangement of atoms are called *conformational isomers* if they *can* be interconverted by free rotation; they are called *configurational* isomers if they *cannot* be interconverted by free rotation. Using these definitions, what type of isomers are the following? What are the names of each of the structures?
   a)
   b)
   c)
   d)
   e)
   f)
   g)
   h)

   How are these related?

5. In question 1, you wrote all the structures (constitutions) of C_8H_{18}. Now write all the configurations corresponding to each constitution, noting those that are mirror images of each other.

6. Supply the missing charges in the following hypothetical compounds, assuming the central atom uses only L-shell electrons in forming covalent bonds. In each case, could you make a reasonable neutral molecule by removing protons or hydride ions (H^-)? Which of the neutral molecules can function as Lowry-Bronsted acids or bases? As Lewis acids or bases? BeH_4, BH_4, CH_4, NH_4, OH_4, FH_4

How to study physics

by Seville Chapman

A proper mental attitude toward the material to be studied is the primary requirement. Because learning physics takes work, resolutions alone will not help. There are no short cuts, but there are ways of learning to work effectively if you seriously want to learn. As a science student, you are expected to know the following:

- the facts of physics
- the principles of physics
- analytic methods of attacking problems
- laboratory techniques for attacking problems
- procedures for applying the preceding items to new problems

When you study or work in the physics lab, train yourself to ask yourself these basic questions:

1. What is the fact precisely? Don't be vague.

2. Why is it so? What is the evidence? (Important!)

3. How does it tie in with other ideas in physics?

4. What is a typical problem concerning it?

5. Have I only memorized it, or do I know what to do with it?

6. What was its importance when it was discovered, and how did it affect the development of physics?

7. What is its importance in relation to what is important now? How? Why?

Developing precise answers to these questions may be difficult and time-consuming, but this practice is a valuable part of your training in physics.

A. General study hints

1. Develop an interest in the subject by learning more about it through outside reading in magazines, newspapers, and so on. Try to relate it to other courses. Discuss the subject with other students.

2. Be alert in class; make a serious effort to stay with the lecture.

3. Adopt a receptive, cooperative attitude. Perhaps sitting in one of the front rows may help.

4. *Reject interruptions.* Find a quiet place to study and keep work. The time you save will enable you to enjoy occasional social gatherings without feeling guilty about not studying.

5. Budget your time. Get enough sleep, some regular exercise, and some recreation. You will learn more physics by studying it for an hour a day than by studying for ten hours over the weekend. This enables you to keep up with your work and helps to make some assignments less overwhelming. Also regular practice reduces exam panic and anxiety.

6. Plan to study physics as soon after class as possible while the material from the lecture is still fresh.

7. When you study—*really* study, instead of day-dreaming or loafing. Keep personal worries off your mind when you plan to work on physics. If you have a problem, get some good advice, think it over, and make a decision. Do this before you study, if possible; if not, make the necessary arrangements, and put the problem out of your mind so you can concentrate on your work.

8. Spend a few minutes before class reading (or rereading) the main paragraph headings on the subject to be covered. Experiment to find out how much of your reading on a subject should be done before the lecture and how much after class.

9. Go over the assignment rapidly at first, taking in only the highlights. Then go over it more carefully, asking yourself the seven basic questions previously listed.

10. When you finish the assignment, plan an exam question, close the book, and answer the question in your own words. Frequent self-recitation is important and a valuable aid in taking an exam.

11. Review the day's work in the evening, the week's work on Friday, and the whole course once a month.

12. Ask your instructor to explain a difficult topic you still don't understand even after working on its analysis. Contrary to the popular student impression, professors are usually pleased when you ask about the course.

13. Pay special attention to definitions; aim for sufficient grasp of the idea to be able to use your own words as well as the text definition.

14. Work the numerical problems carefully with complete understanding of each process.

15. Go over your notes within a few hours of the lecture, correcting, clarifying, and completing them.

16. Regard the physics lab as a place for intellectual exploration. Study your manual in advance so you can plan to use your time efficiently. Establish an attitude of curiosity about the experiments. *Why* is a very important word to you.

Guide to successful study of physics

1. Proper mental attitude and proper procedures are necessary for effective study.

2. Develop a system of study that is best for *you*.

3. Put special emphasis on learning how to attack problems and how to apply what you know.

4. Ask yourself questions on the material while you study it.

5. Study regularly in a place as free from distractions as possible.

6. Get enough sleep, exercise, and recreation.

7. Get the overall view, as well as instructions.

8. Don't believe everything you read; see if it makes sense to you. Ask: "What is the evidence?"

9. Review material frequently; self-recite and discuss with other students.

10. *Overlearn*. If you do not understand this, get help in grasping the importance of this principle in the study of physics.

11. Pay close attention to definitions.

12. Include explanations in your notes.

13. Be sure your math skills are good. If not, review the mathematical fundamentals you need.

14. Prepare for lab experiments in advance.

15. Write lab reports in a clear, well-organized, concise style.

16. Review regularly.

17. Make up suitable exam questions based on lecture and lab material.

18. Think before you write exams so your ideas are clear in your mind.

19. Always review returned exams to see where you were weak, then clear up the deficiency.

20. Seek help from the library or a tutor if necessary.

VII. Health careers: something for everyone

The health field, perhaps more than any other career area, offers wide-ranging opportunities which can match almost any interest.

Do you like to work with your hands? Dental technicians, optical mechanics, biomedical equipment technicians, prosthetists and many other health professionals work with their hands.

Are you interested in working with machines? Respiratory therapists, electroencephalograph (EEG) technologists, and radiologic technologists are just a few professionals who work with patients through the aid of medical machines.

Are you fascinated by photography or the fine arts? Art, music, or dance therapist or biological photographer are among the health careers where you can use these talents.

Do you enjoy working with people? Nursing, medicine, dentistry, optometry, social work, rehabilitation, and mental health are some health career areas that will give you the opportunity to work with, and help, people of all ages.

These careers only scratch the surface of possibilities. Health careers offer something for everyone; but, too often, students say "no" to health careers simply because they don't have the real facts.

Could you fall into this trap? Let's see. Below are some common statements students make when talking about health careers.

"I couldn't work around sick people in a hospital. That's depressing. Besides, I can't stand the sight of blood."

A health career doesn't automatically mean a hospital job or care of the sick. Health careers have many facets. You can work in health care in research, health planning and administration, health education, disease prevention, environmental protection, and other important areas.

Jobs are not just in hospitals. Private doctors' offices, school, government, industry, and many other places need and employ health workers, too.

But don't judge hospital work until you try it — either as a hospital volunteer or as a part-time employee. You may discover by working there and observing trained health professionals, you, too, can learn to accept the less pleasant parts of helping people get well as a fact of life.

You'll also find that even in hospitals many jobs are "behind-the-scene" with little or no direct contact with patients.

"You need science and math for health careers. That's not for me."

Sure, science and math are required for some health care jobs but many don't require or emphasize these subjects. Health education, social services, and mental health are just a few areas where psychology, social studies, and other subjects are stressed. But even when science and math are needed, different levels of skills are required. Some career occupations like optometrists and scientists require in-depth knowledge while many other careers require just good basic skills and working knowledge of these subjects.

"Training takes too long."

Yes, some careers do take seven or more years preparation after high school. But most require only two- to four-years preparation — not a very big investment considering that most people work *over* 40 years in their lifetime. But two- to four-years is just an average. Some can be learned in *less* than two years' training, some even on the job.

"Training costs too much."

In one sense, costs are only relative. It must be balanced against what you can earn. Figures show that lifetime earnings generally increase with years of education. On the other hand, if you don't think you can afford training, you're not alone. Most students today need financial aid for training.

"The training is too hard."

Don't sell yourself short. Many students who felt the same way are now working as doctors, nurses, therapists, technologist, or as other health professionals. If you think training may be too hard for you, because you've not been doing well enough in school, then think twice. A change of attitude, a special remedial program, or additional study may be all you need to succeed. By trying, you might discover that health careers training is like learning anything new. It can be difficult at first but with time and effort, it is possible.

A. Exploring health careers

Career exploration is a real learning experience. You don't have to make any definite career decision. Instead you make new discoveries about yourself and the world of work.

While you're exploring, learn as much as possible about each health occupation. Find out: Where, how, and why the health worker performs this kind of work? What skills and knowledge does he or she need? What is the work setting like? Does the job involve working alone or with others? What are the minimum job requirements in this profession? Is licensure, professional certification, or registration a factor in gaining employment? How much does the job pay? What are the advancement possibilities? Finally, what is the job picture where you live and elsewhere in the country?

How do you start exploring health careers? That's easy. You've already started just by reading about health careers. But don't stop here. The information in this book is just the tip of the iceberg. Read more about health careers. Visit your school or public library. Write to the professional health organizations and to the schools that provide training for health occupations.

The information you'll get from books and pamphlets can be very helpful, but it's no substitute for your own firsthand investigation. This requires one special ingredient — you. You must now explore by *doing*. Investigate your health career potential by trying these activities:

Visit a hospital, laboratory, or other health facility. Most institutions welcome the opportunity to show their facilities to interested students and the community-at-large. Some may schedule regular guided tours; others may offer these by special appointment. A hospital tour, for example, will give you a good overall picture of the many different departments and jobs which are part of medical care. You'll also learn about the hospital's special services and programs and how it helps the community. You can arrange to visit a health facility by contacting the Director of Public Relations or the Office of the Administrator.

Visit health occupations schools. Like health facilities, most schools offer tours or hold open house days where you can meet teachers and students, find out more about the profession, what training involves, and the necessary entrance requirements. Some schools even permit prospective students to spend a day on campus, attend classes, and get a special preview of student life. The admissions office of the school should be contacted to make the necessary arrangements.

Talk to health professionals and students in health training. You'll receive a special outlook on the career and obtain information you won't find in any book. Ask them: How did they get interested in and choose their particular field? How difficult is the training? What happens during a typical school day or workday? What do they like most — and least — about their chosen profession? You can meet health professionals and students through exploring many of the activities described here. Your family doctor, school nurse, guidance counselor, or teacher may also be able to assist you.

Work in a health facility or agency. A part-time or summer job in a hospital, nursing home, laboratory, other health facility, or agency can give you intensive, first-hand experience. Generally, you will have an opportunity to observe trained health professionals in action and perform simple tasks. Start your job hunt by making a list of potential health employers, then contact the Director of Personnel of each facility or agency. Find out whether they hire part-time or summer-student help and, if so, how can you qualify. Summer jobs are often hard to obtain so it's important to contact potential employers *early* — several months before the summer season.

Volunteer in a health facility or agency. It's not always possible to get a job but almost everyone can volunteer. Generally, the only requirements are that you have some free time (3 or 4 hours per week) and are interested in helping others. Hospitals, nursing homes, social service agencies, correctional institutions, and day care or senior citizen centers are among the places where volunteers can be found. Unlike a job where specific work is assigned, volunteer positions are flexible. Every effort is made to assign volunteers to areas of their choice. In general, volunteers provide services which support or complement those of the paid staff. They do not substitute for regular workers.

What exactly does a volunteer do? That depends on the policy of the individual institution. In hospitals, volunteers assist patients and staff by providing those special extras for which regular staff may not have time. Some examples of volunteer positions are:

- Patient escort: Help transport patients from one area of a hospital to another
- Friendly visitor: Spend time talking to patients, making them feel more at home, perhaps reading to them or writing letters for them
- Messenger: Carry messages for staff from one department to another
- Department aide: Help staff wherever assistance is needed. On a nursing floor this may mean answering a patient call light and relaying the patient's needs to the nurse in charge. In the Recreation Department, a volunteer might organize and lead a small patient group in a game or other activity.

Volunteers do these tasks and more. New work assignments in both patient and nonpatient areas are constantly being developed to meet the hospitals' needs and the individual interests of their volunteers.

If you'd like to become a volunteer, contact the Director of Volunteer Services of the health facility or agency in which you're interested. He or she can tell you what volunteers generally do at the institution and if there are special requirements. Don't be afraid to let the Volunteer Director know which health careers you're interested in exploring. With this information the director can make a good assignment for you.

Join health career clubs or programs. Many schools and community organizations sponsor activities which allow you to explore health occupations. The Girl Scouts, Boy Scouts, and Explorers all have special health career programs. Many secondary and post-secondary schools have a career club. If your school doesn't, you can help start one. Some high schools have prevocational health occupations programs. There is even a national student organization for students enrolled in these programs called the Health Occupations Students of America (HOSA).

To find out whether any of the above activities are going on in your school or community, check with the guidance department, the school nurse, or student health service.

While you're exploring, keep an open mind. Investigate many careers, not only those with which you're familiar. Remember the more information you get now, the better your career decisions will be later.

Each year many interested and qualified students give up on a health career simply because they have not explored alternate choices when their first career choice isn't possible. A prime example is the aspiring medical student who is not admitted to a medical school and drops the health field entirely.

The health field is vast; in it you'll find many related careers where you can contribute and find personal satisfaction. The health field doesn't want to lose your talents, so have other options ready.

B. Preparing for a health career

Whether you realize it or not, you are preparing for your health career right now. Your training in high school and college provides the foundation upon which your later health-occupation training will build.

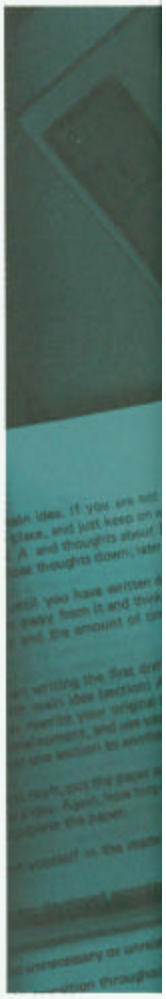
Even if you haven't chosen a particular career yet, you can still prepare. You can't go wrong taking courses which will improve communication skills like English and writing and courses which will build reading speed and comprehension. If you're considering a science-oriented or patient-care career, take laboratory sciences and mathematics courses, too. These subjects are routinely required in these areas.

Depending on the profession(s) you are considering, a high school diploma, some college, or a college degree will be needed before you begin your training. But regardless of how much preprofessional education is required, the same rules apply: Contact the schools which offer programs for your health profession early. Most health professions organizations can provide you with a school list. Find out what specific courses are required for admission; then take those courses.

If you are still in high school and are considering a career where graduate school education is necessary, it's still important to contact the professional schools early. This information will help you choose high school courses that will give you a good foundation for your undergraduate education. It will also guide you in later selecting a preprofessional curriculum in college.

Competition for admission to most health careers training is keen. Grades definitely count. Good grades now in all your courses, but particularly in those required for admission will pay off later — when you face that competition.

Health Careers Guidebook. US Dept. of Labor/US Dept. of Health & Human Services.



Planning for
California's Health Care Future

OSHPD

OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT