

How to Read a Science Textbook |
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Scientific subjects such as environmental problems, the energy crisis, AIDS, medicine, engineering, space exploration, and terrorism have become front-page news. What we do about the problems existing on our planet and the way we react to new developments affects, like it or not, not only our personal lives but also the lives of the rest of humanity. With all the problems facing our planet and the fact that we can make a difference with our actions, it is imperative to be able to see beyond the smoke-screens, dissect the fake reports, acknowledge the facts, face the choices and solutions, and do something about them. Science seems to play an important role in all of this, and for us to be able to play a constructive part in the choice-making process, we must speak its language, at least in the most basic level. To do this requires us to read scientific literature.

How does one go about reading a science textbook? Nobody expects you to understand everything in the book by reading it only once. You will probably find many descriptions of phenomena that seem incomprehensible. Just as scientists learn by trial and error, experiments, and theoretical models, you improve your comprehension by developing your reading skills.

There are obviously different ways to read your assignments for maximum understanding. I recommend you do step #2 first (inspectional), then prior to class read the assignment using the elementary method, and after class, reread the assignment using the analytical method. However, do what's comfortable for you. Write down questions you have and ask them in class next time.

There are three levels of reading:

- 1) elementary - This first level requires only the skill of being able to recognize the words and understand the meaning when you read a paragraph.
- 2) inspectional - This level allows you to familiarize yourself with the book without worrying about the details and without stopping at difficult places. Discover what the book is all about and gain an overall view of the topics covered and their order. The most important thing at this level is to concentrate on the big points being made. How do you do all this?
 - a) Look at the table of contents to see what topics are covered and try to determine if there is a reason for their particular order.
 - b) Second, find out if the book includes some appendices and a glossary (a dictionary defining some of the terms often used in the jargon of each discipline) which you may find useful as you start reading the chapters. Some books also include in many chapters essays where a specific idea, loosely related to the main subject of the chapter, is expanded upon (e.g., on the chapter about the Earth, you may find an essay on the Ice Ages, and on the chapter about Asteroids, you may find an essay on Extinction of Dinosaurs).
 - c) Read the introduction and the summary of each chapter and get an idea of what the text is all about and what kind of reading is expected of you.
 - d) And again, the most important thing: concentrate on the overall picture and do not worry about the details.
- 3) Analytical - This level requires active reading. The more active your reading is, the more you will benefit and enjoy. A science textbook/magazine/article presents you with information about things you

are probably not very familiar, and it does not tell you what to do with this information. When you read a science textbook, if you find yourself asking the questions like, "What is this book about?" "What is being said in detail?" "Is what is being said true?" and "So what?", then you are on this third level of reading.

Your purpose here is to understand, to ask questions, to check the information and conclusions presented to you, and to convince yourself that they make sense. Discover the important points of each paragraph and how they are developed, find if they are significant and why, and again, make sure you are convinced by the information and the reasoning presented to you. If you are confused about something, or if you think you need more information, ask me.

The best way to work at the analytical reading level is with pencil in hand to write in and mark the text and express what you are reading in your own words. Find what connects the ideas presented in the different paragraphs and how they are in turn connected to the main point of the chapter, and write this down in your own words. As your various types of markings, you can use:

- underlining the main points of (but not all) the paragraph; using vertical lines or symbols (e.g., an asterisk *) in the margin to emphasize underlined statements or long, but important, passages;
- using numbers in the margin to mark a sequence of arguments or observations made to support a theory;
- making cross-references when you notice that the same point is made again later in the book (usually with more details) and thus finding connections across the whole book.

And again, the most important thing for you is to write important points in your own words. When you try to do that, you will find which ideas you do not understand. You can mark them and come back to them later, and at the end, you will be able to review the important aspects of a section by looking at your own notes instead of having to read the section all over again.

By following the suggestions presented here, you will be able to understand the subject matter, appreciate problems that exist, and with your knowledge be able to play a constructive role in the efforts for their solutions. As mentioned before, like it or not, our actions or inactions on some problems affect not only us but also everybody else on the planet. In that sense, it is our duty to make sure we understand the problems and take a part in the efforts to solve them. This begins by learning how to read science books and ask questions.