

Studying Science

What is different about reading in the sciences?

- Readings contain a large number of facts and specific details. There must be an overall understanding of the concepts in order to be able to process the details.
- Placement of main ideas and details is usually straight forward (headings and subheadings).
- Organizational pattern is usually "relationships", i.e. ideas and details building upon previous information. A solid background of the basics in the discipline is necessary to understand and comprehend the information.
- Terminology is subject specific and must be understood to comprehend information presented.
 - **Note-cards are especially helpful!**
- Diagrams, figures, charts, and graphs are numerous.
 - **Know what is relevant and what is unnecessary.**
- Knowledge and comprehension of the readings and lectures must be taken to an "application " level, i.e., the ideas learned should be applied to new or different situations other than those presented in the texts or lectures.

Everything is about science! For example,

- Baking and cooking uses the knowledge of chemical reactions.
- Understanding how sound works uses the knowledge of compression waves.
- Any sort of movement or standing still incorporates the use of physics.
- Looking at the mountains or a canyon involves earth science.
- Research is an extension of information.
 - In order to read research and understand it, the basics of the discipline must be understood.
 - Think of research as taking an idea, analyzing, synthesizing and extending it.
- Difficulty of material often necessitates more than one reading for thorough understanding of information. Try paraphrasing the reading and reviewing how close you were.

How does one read the sciences?

BEFORE THE LECTURE:

- ✓ **Preview the chapter.** Briefly look over titles, introductions, subheadings, first few sentences beneath subheadings, figures, diagrams, italicized or boldfaced words and terms, and summaries. As you preview, ask yourself:

- **What is this about?**
- **What do I know about this ... and don't know or don't remember?**
- What is the organizational pattern (relationships, chronological, topics?)
- How does this fit into what we are learning in this course?
- Is there terminology that is unfamiliar or that I will need to review?
- How important is this information? Are there parts I could skim and get the main ideas?
- Where can I make logical breaks in the reading to divide up my study time?
- In what order might I read the information in the chapter? Would it be easier and more motivating to read the most interesting section first?

***** Write down specific questions to ask the professor during the lecture. Talk to peers.**

- ✓ **Skim the chapter** in more detail, but don't try to read it thoroughly yet. **Remember, this is only suggested for the first reading.** Additional reading is highly recommended.
 - Read first and last sentences of paragraphs.
 - Pull out some major ideas and details.
 - Examine charts and figures. Try annotating or evaluating as well.
 - **Try to understand the more important and frequently repeated terminology.**
 - Think about the overall organization of ideas.
- ✓ **Don't panic or become overwhelmed with the readings.** Ask people, and use the internet! They may be dense, but not unconquerable. By previewing and skimming the materials before the lecture, your brain will better process the new information.
- ✓ If the material is quite difficult and detailed, and if you have little background in the discipline, it might be useful to **review the fundamentals and basic terminology** in an introductory text in the field.

IN CLASS:

- ✓ Be prepared to anticipate information acquired from pre-skimming your textbook, and listen for clues during the lecture that will help you focus on an appropriate level of comprehension when you read the related chapter(s) after the lecture.

- ✓ Take notes!
- ✓ **Ask your professor if you are confused or have any questions.** The professor is here to teach and help you, make the most of it!

AFTER CLASS:

- ✓ Review and edit your notes taken from the lecture. Begin thinking about what additional information you'll need to add from the text and take notes on this!
- ✓ Read the related textbook material that you have previously skimmed.
 - Re-preview and break the reading into logical sub-sections to be tackled one at a time.
 - Plan far enough ahead of time that you'll be able to take a break and move away from the material at the end of each sub-section if you feel overwhelmed. Often, time is needed to allow the mind to gradually absorb complex ideas.
 - Read carefully and methodically, referring to figures and diagrams as appropriate. Be careful not to distract yourself.
 - After reading a sub-section, stop and recall what you've read:
 - Tell it to yourself in your own words
 - Take notes.
 - Draw your own diagrams or charts to summarize and translate information.
 - Review your notes and the reading periodically.
 - Information needs to be reviewed and used periodically for it to be stored in long term memory.
- ✓ Reflect upon the information in various ways:
 - Again, use the internet! Do independent research.
 - How are these functions related to each other?
 - How do they affect each other?
 - Apply ideas learned to other or new situations: What would happen to the body if one of these areas/functions/organs were damaged or destroyed? etc.
- ✓ Anticipate and practice responding to the kinds of test questions that might be asked.
 - Write a practice test for yourself and a few classmates.