



Office of Learning Resources

University of Pennsylvania
Suite 300, Stouffer Commons
3702 Spruce Street
57-EXCEL (3-9235)
lrcmail@pobox.upenn.edu
<http://www.vpul.upenn.edu/lrc>

Studying Biology: I thought I knew everything (but I still got a bad grade)

Many students encounter the same problem: they study intensely for days or even weeks before the test, but their grade doesn't reflect their effort. The reason may lie in the *kind* of effort—the “how” of studying, as opposed to “how much.” Basic biology courses at Penn involve lectures and readings that include a great deal of factual material. However, rote memorization of all the facts will not produce a thorough understanding, nor will it produce a good grade on a test. You will need to be able to think about the material and synthesize various concepts and facts in order to do well on the exams.

First, **keep up** with class lectures and reading assignments. Learn how to take effective class notes and review your notes within 24 hours of each lecture. Also, it is crucial to quickly become familiar with and adapt to your professor's teaching style. For example, for some professors your class notes can serve as a guide to what you need to know in the textbook.

Second, to read most effectively, you should first skim a chapter and/or read the “key concepts” sections at the end of the chapters before you do your more careful reading. This “pre-reading” will give you an **overview** of the topics and will provide a **context** for understanding the many specific facts, definitions, and examples in a given chapter.

Third, attend to the optional, **weekly** faculty-led or student-led **discussions** on a regular basis. These discussion sections provide an excellent opportunity to ask questions, hear clarifications of difficult points, discuss interesting topics in greater depth, and discuss previous exam questions.

Finally, **evaluate** the **methods** you are using to **study**. A Learning Instructor can help you identify your current study habits and decide which of these are helpful and which can be improved. To get you started, read the following suggestions and see which ones you already use and which ones might be helpful for you to try.

1. **Do you synthesize all your notes—from the lectures and your text?** You may want to make one easily accessible study sheet. This study sheet shouldn't be packed corner to corner, but should have key ideas and pictures to jog your

memory. In designing your study sheet, focus on the information you have yet to fully master.

2. **While studying, can you provide a summary of the lecture or chapter in words and pictures without looking at your notes or the text?** Redraw pictures or graphs from memory. Try to explain out loud each part of the picture or graph, and then explain how they relate to the other parts. Explain how one picture relates to another, and so on, until you can pull the whole lecture or chapter together.
3. **Do you create your own flow charts or concept maps to organize large quantities of information?** Get a set of colored pencils or pens and get creative! A Learning Instructor can help you practice this technique, using your own class notes and textbook.
4. **Do you study with a small group of dedicated students?** It is helpful to get different perspectives. Have each member bring five practice questions to each study session to quiz each other. Try to write questions in the same format(s) that your professor uses. If you don't feel comfortable with an answer, take your sample problem and answer to the professor, discussion group leader, or TA. They will be impressed by your efforts to master the topic!
5. **Do you attend review sessions?** Bring specific, well-thought out questions about topics or areas you are still trying to master. Ask a member of your study group to join you; compare notes afterward.
6. **Do you review the various topics or practice questions in random order?** This is important to do when studying so that your mind can become accustomed to jumping from topic to topic on the test. Old exams are useful for this purpose.
7. **Do you analyze your previous tests?** This is a powerful study tool. Examine each question. Look at what you got right and ask yourself why you got it right. Do the same for the questions you got wrong. Make a thoughtful and well-considered comparison between your answers and the answers in the key and ask yourself what you would have needed to do differently to get the question right. Eventually, you should be able to see patterns in the professor's style of questions, your way of thinking through problems, and your test preparation. Then you can use these insights to plan how you will study in the future.

[Dr. Ingrid Waldron's contribution to this self-help is gratefully acknowledged.]