

Tips for Success in Biology

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1. Attend class! Participate. Don't just sit there and think to yourself "I'll get it later. I'll study later." Mentally engage.
2. Take notes. Write down what the professor SAYS, not just what he/she writes on the board or slides.
3. Read your class notes within 24-48 hours of attending the lecture. Over 70% of the lecture is lost to you a week after you attend if you don't review it again. Just sneak in a few minutes to read them over. It can be over coffee, over lunch, or while waiting for your next class to begin.
4. Read the text but don't treat it like a novel. There is no plot, no heroine, no villain. You could probably rewrite it in an intriguing story format but as is, it won't read that way. The trick is not to get overwhelmed and lost in the detail. Here's what you do:
 - a. Look at all the pretty pictures first! We're human. If you are fortunate enough to have the gift of sight, your brain is probably pretty good at remembering pictures. It isn't going to take pictures of text that you can recall any where near as well as it will take pictures of pictures you can think back to later so take advantage of this human trait. Look at all the figures and read the figure legends. If you don't understand what is going on in the picture/figure, look at the figure legend number and find the corresponding part of the text. Read that section to try to get a better grasp on the subject matter. For every major concept in the text, there is usually going to be a figure to go with it.
 - b. Read the text with your class notes next to you. I recommend you print the powerpoint slides 3 to a page so that you have room to write. You can add important key words and points from the text directly onto the relevant powerpoint slides as you read. Writing things down will help you remember them. Notice I said WRITE. I did not say TYPE. We don't know why but studies have shown that typing information is not as effective as handwriting information out in terms of transferring the information into our long term memories. Typing may be prettier but it is not as effective as a study tool.
 - c. As you read, turn the headings into questions. For example, if the heading is "Photosynthesis converts light energy to the chemical energy of food", then my question might be "**How** does photosynthesis convert light energy to the chemical energy of food". By reading for an answer rather than just reading, your mind is focused. You can more easily pick out the main points and concepts without getting lost in the detail. Your mind will also be more engaged. When you get to

the end of the section, go back and ask yourself if you can answer the heading question. If not, skim back through the text for the answer.

- d. Do the Concept Check questions at the end of sections. These are great questions. You need ways to test both your understanding and your recall ability on the material. The answers are in the back of the text. Do the questions first before checking the answers. Memorizing the answers to questions is not an effective way to study for biology. That only works if the professor only asks the exact same questions for which you memorized answers. By attempting to answer the question yourself you discover whether you really know and understand the material or if you need to study some more.
 - e. Do the questions at the end of the chapter. See d. The same logic applies.
5. Test yourself. I cannot stress this enough. Understanding biology when listening to the professor in class or looking at the book does not automatically equate to a passing grade. You need to understand and be able to RECALL the material when the book/notes/professor is not standing in front of you. This is what you will have to do on the exam. You will need to practice the RECALL part. Here are some strategies:
- a. Pick a subtopic or chapter section. Take out a blank piece of paper. Write down (notice it's WRITE again and not TYPE) everything you know about that topic. You can make a list or an outline or a paragraph. Whatever you like so long as you force yourself to write down what you know. Look back at your class notes and the text. Did you leave out any important points? Did you get stuck and need to go back to the book to complete the exercise? This tells you what you need to study a little more. Flip the page over. Do it again. Recall and repetition.
 - b. Make a concept map. See last page for an example from a student in the BIOL1361 Intro Biology class. This student picked her topic to review (biological molecules) and sat down with her notes and wrote in everything she thought she might need to know for an exam. What does she get out of this activity? Repetition. She is engaging with the material and the book. Notice I said engaging. The material is not just passing by her eyeballs. She is organizing it. The structure doesn't really matter. It's her study sheet. There are no organizational rules that you must adhere to. She can then take the map, turn it over and see if she can replicate it on another sheet of paper. What did she forget? Hmmmm....review it (more repetition). Repeat the exercise.
 - c. Sketch diagrams of processes. For example, cellular respiration is a process. Can you go from glucose (the initial input) all the way through to ATP synthase and the production of ATP? Do you know all the steps? Do you know the inputs and outputs?

- d. Use the Art for Students feature of Mastering Biology. You can print unlabeled versions of your textbook figures. Can you label them yourself. Can you put in the inputs and outputs of a process such as cellular respiration (c above)?
- e. You can use the “Tell it to Grandma” approach. If you can explain a section of material to your grandma, sibling, roommate, sorority sister, study buddy, etc., then you own the material. If you can’t find a willing volunteer, just shut the door and verbalize the material to yourself. If you get stuck somewhere or aren’t quite sure about something, you’ve now highlighted for yourself where you need to go back and review material. Be sure to check your notes to be sure you didn’t miss anything important in your explanation. A study partner from the same class can be very useful for this purpose because they might catch what you missed.

6. Use the Study Tool section of Mastering Biology. You are paying a lot for this tool. Your professors did not just chose this textbook and software package so they could assign you homework. They selected this material because it has the study tools section to help you structure your study time and practice your understanding and recall of the material. You paid for it. Use it. The animations and Bioflix films are great reinforcement of key concepts. The self-quiz and practice test provide a lot of opportunities to test your understanding.

7. Why did you get the wrong answer on the exam or Mastering Practice test? Knowing why an answer is wrong is as important to mastering the material as knowing which answer was correct. It provides depth of learning. When reviewing your exams (and you should visit your professor during office hours or make an appointment to do this), check and see what you missed and why. There are usually a number of reasons a student gets an answer wrong:

- a. You simply didn’t study enough and didn’t have a clue. This can be fixed by following the advice on this sheet. You must put effort in to get good grades out. Remember, professors don’t “give” grades. You earn them. You earn them by studying.
- b. You second guessed yourself out of the right answer. If you are prone to this, spend more time studying so you are more confident in your answers. Secondly, go with your gut instinct! You need to go back and look at your exam to see if this problem applies to you. If you know you suffer from test anxiety, you should definitely check your exams and see if you are falling into this category. Know your tendencies.
- c. You didn’t answer the question that was actually asked. You spotted a few key words and then selected an answer based on your mental idea of what answer should match those key words. This can be fixed by reading carefully and asking yourself if your answer actually matches the question. Ask yourself why the other answers are incorrect. Asking yourself why the other choices are incorrect will sometimes cause you to realize you aren’t answering the question that was ask so you can “save yourself” and go after the right answer. Read carefully.

You've read your shampoo bottle, right? The directions say to wash, rinse, repeat. In biology this equals review, recite, repeat! I was once told by my College of Education professors that it takes 12 repetitions of the material for it to get permanently stuck in long term memory. It may not take you 12 repetitions, but it will take a few to truly be prepared for the test and to retain the information for the cumulative final. For those of you that are majors in the life science, you need to retain it permanently. This stuff will definitely come back to haunt you!