

## Study Techniques for Premedical Students

If you have been admitted to Johns Hopkins, you have been academically successful in the past. You likely have preferred and effective methods for studying, but some of those techniques might not transfer easily to studying science. You might have to adjust and refine your studying techniques to meet the rigors of science course work at the college level. As you begin to study science and then eventually prepare to take the MCAT, we want to stress a few key points and offer some study techniques that may help you in your transition to studying science and serve as supplements to your current methods.

Successful scientific endeavor requires a **tremendous attention to and command of detail**. Trying to master the sciences without memorizing any formulas or reactions is like trying to master a language without learning any vocabulary (remember: you will not have an equation sheet to refer to when you take the MCAT!). You need more than just the “big picture” to succeed. You will be asked to assimilate and retain vast quantities of information. As a result, **time management** and **attention to detail** will become extremely important skills, both now and in medical school. The strategies listed below have been effective for premedical students in the past, and you may wish to consider trying them.

Many premedical courses are taught in large lecture-style presentations, using textbooks to reinforce material. **The most important and relevant material is usually that which is explicitly covered and/or hinted at during the lecture.** An exam cannot include all of the material presented in class or available to you in the textbook. Your job is to determine, isolate, and focus on the most pertinent information. **Active learning** involves being able to relate information across contexts: to use class notes to guide the reading of the textbook in order to extract relevant and supportive material, and to integrate that material into the class notes while reading.

Please note that the list of suggestions below should not be taken as a set of concrete rules that will work for any course; subjects and professors’ teaching and testing styles can vary significantly. However, these suggestions may prove to be helpful across a range of subjects. You must learn, of course, to adapt your studying methods to the circumstances at hand.

Here are some techniques that you might find helpful:

**Previewing/pre-reading** are efficient ways to prepare to understand new information. By skimming the material that will be covered in lecture ahead of time, you will develop some familiarity with new terms, equations, and concepts. This can make lecture much more understandable and, thus, enjoyable. It is also easier to take notes if you pre-read lecture material. **Pay particular attention to the charts, tables, and figures in the textbook.** Here are specific techniques to use:

- Check the syllabus to anticipate the sections of the textbook that will be covered in the upcoming class.
- Skim the chapter(s) and/or relevant textbook material to familiarize yourself with the material and the language/terms/formulas introduced. Focus on highlighted words, diagrams, charts and graphs (as noted above), and introductory and closing statements in paragraphs.

### **Lectures and Note-Taking**

- Take the very best notes possible during the lecture. Record the professor’s **main points** in your own words--don’t try to write down everything that’s said. Do, however, attempt to write down the important details of the lecture, such as specific examples that will help you

to understand and remember concepts later on when studying. If you pay attention and take good notes, you should get a sense of the most relevant points made by the professor.

- Try to get a sense of the outline or sequence of topics in a lecture; attempt to reflect this in your note taking. For example, make headings and sub-headings to organize and group concepts. If the lecture goes too fast for you to organize your notes during the lecture, you may have to rewrite them later (see below).
- Leave plenty of blank space in your notes that can later be used to add supplementary material. There are several ways of doing this: (a) write only on the right-hand sheet; (b) write only on 2/3 of the page and leave the other third blank; (c) leave 2- to 3-inch gaps of space between major points that the professor makes during a lecture.
- Use as few words as possible--devise symbols or use abbreviations (this is especially helpful in science courses). **The less time it takes you to write down material from the board and lecture, the more time you have to watch the professor's demonstrations and listen carefully to explanations**, which will help you later on in understanding and visualizing concepts.

### Reviewing Class Notes

**It is very important to review class notes** to help reinforce material and should be done in close proximity to the day's lecture to be most effective. This doesn't take that long (20 to 30 minutes at the most) but can be very effective in using short-term memory to both reinforce and clarify concepts. Here are some helpful tips:

- Review your notes for a class on the **same day** that you took them.
- With a pencil or a different-colored pen, react and add to the class notes; this will aid in the review process.
- Note particular points from the lecture that were unclear; recall from your short-term memory additional details that you were not able to record during lecture, and add them to your notes.
- If necessary, rewrite your notes (see below) to get greater clarity.

### Rewriting Notes

**Rewriting notes** can *sometimes* help you organize material into a clear, logical progression—if your notes are illegible or disorganized. At times, professors may jump from topic to topic in class, and your notes may reflect this. In studying for tests, it is much easier to review a clearly organized set of notes than a jumbled mishmash of important facts. If you take class notes on the right side of a bound notebook, you can rewrite them in a more organized fashion on the left side of the notebook. Some students have found it helpful to rewrite their notes into a word processor, inserting helpful images from the internet when needed (try an image search for any topic using Google). Another advantage of rewriting class notes is that it forces you to re-examine and absorb newly acquired material. One word of caution: you need to be careful about over-focusing on rewriting notes and avoiding practice problems or other useful study strategies.

### Informed/Interactive Reading of the Textbook

- After attending the lecture and reviewing your notes, carefully read the assigned textbook material. (This might not work for every class--some professors expect students to have read the assigned material for that lecture, and will ask questions about it in class. Get a feel for your professor's expectations and then determine the best time and an appropriate strategy to read the text.)

- While going through a detailed reading of the text, simultaneously consult your lecture notes pertaining to that material. This will help you to focus on the most important points contained in the text, using clues gathered from the lecture and class notes.
- Reading the textbook should be an **interactive process**: class notes will guide you in determining which parts of a chapter you should study in detail and which you can skim or skip.
- **Examine charts, graphs, and illustrations**--these can prove to be some of the most valuable parts of a chapter, and can be very important in understanding material and preparing for exams.
- When appropriate, copy into your notes detailed explanations from the text that supplement or clarify points made in the lecture. Now is the time to use the blank spaces you left on each notebook page during lecture.

Students in science classes must also consider the following:

**Solving Problems** is more applicable to general chemistry, physics, and organic chemistry than biology. Working through problems based on the concepts you learn in lecture and in the texts provides a definitive test of your understanding. **This is especially important in physics.** If you can solve several randomly chosen exercises, then you have reason to feel confident in your understanding of the material.

**Using Flashcards** is an effective way to memorize equations and other bits of necessary information. It takes time to make the cards themselves, but again, you are reviewing the material even as you create a new study tool. The convenience of flashcards is unsurpassed: you can take a handful with you and use them in between classes, during free time, etc.

**Studying with your classmates** is a very effective way to draw upon the collective understanding of your peers. You will find that your classmates are one of the best resources available to you, as they can often assist you in solving difficult problems. **A few caveats:** do not depend on your classmates unnecessarily; make sure that you understand the material thoroughly yourself, and have the confidence to go into a test and tackle the material on your own. Also, some people may find it more time efficient to study alone, and work with a group just to reinforce concepts.

**Getting Help:** In the event that you find yourself struggling with any course, do not hesitate to approach the teaching assistant or any of the professors for help. **One of the hallmarks of a good physician is having the ability to recognize and deal appropriately with one's own limitations.** Seek out the support of the TAs and/or get help through tutoring offered through Academic Advising. Studying science is cumulative and you cannot fall behind; thus **it is imperative that you get help when you need it.**

We are dedicated to making your time at Johns Hopkins as rewarding and enjoyable as possible. We sincerely hope that the tips offered above assist you in your transition to premedical coursework.

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# The Study/Review Cycle

