

How to Study for Science Exams



1. Leave Yourself Time to Prepare



The time you require to study and do well on an exam varies per person and depends on subject matter. When I was an undergraduate student, it took me at least 10 hours of preparation in order to get an A. This may seem like a long time and it may take you longer on some subjects than others. However, if you break this time up over 3 to 5 days, it is not so bad.



2. Consolidate, Condense and Recopy your Notes.

You can do this in the form of pages of notes or cards. The recopying out of your notes will help you to memorize them. Also, consolidating all your notes into one place saves you the time of having to locate and jump between the text, notebook, handout, Powerpoint presentation etc. When everything is in a single set of notebook pages or cards you will not forget material that was jotted down in the corner, on the back of a Powerpoint handout for example. Go over all the different kinds of problems you learned and make sure you still know how to do them, especially those from early in the semester. The textbook, which you should be reading is very good for this.

Make your consolidated notes easy to memorize from. Condense notes down to essentials only, no filler. Definitions should only contain essential words. For example, from the text *Chemistry Structures of Life*, the definition of Mitochondria is: Contain structures for the synthesis of ATP from energy producing reactions. Your condensed version may be something like: Mitochondria – energy producing reactions make ATP.

Draw simple pictures to help you understand and memorize not only visually based things but other concepts. The hardest things to memorize are long lists of text where everything looks the same. Adding little diagrams and pictures help you remember complex processes, such as the path of blood through the heart for example. Understanding and memorizing this is probably more easily done by drawing a simple diagram, rather than a list of pathways. Acronyms also help in memorization of lists. Eg. LEO goes GER means lose electrons oxidation / gain electrons reduction.

Make sure you know all the variants of a problem. For example, density problems can ask you to calculate three different things not just density! A problem may ask you to find the mass of an object, given its density and volume. It could also ask you to find volume given density and mass. You may also need to find volume by displacement. This will help you to avoid “I didn’t know he/she was going to gives us that”. Also, using examples of the problems that are more detailed and require more steps can be used to prepare for the simpler problems that are like them.

Practice using new problems to make sure you know how to do them. If you need to, jot down short notes on how to do more difficult problems. For word problems, make sure you know the clues that tell you how to assign numbers to variables, for instance: the phrase “after the pressure is changed to 2.6 atmospheres” in a Boyles Law problem indicates that $P_2 = 2.6 \text{ Atm}$. When taking an exam you don’t have time to spend refiguring out how to do a problem! It will be like trying to land the space shuttle with the instruction manual in your lap!

While doing this you should also take this time to make your notes neater, as well as correct and clarify errors and vague writing.

Study groups work very well for this part of exam preparation!

3. Memorize and Test Yourself



Ideally, this step should be done by yourself in a quiet place with no distractions. This will reduce the time it takes for material to be memorized. Also spending about 30 minutes after each class going over your notes will substantially increase your retention and decrease the amount of time needed to prepare for exams.

Both the understanding and memorization are required to do well. Start by getting the concepts down first, this will help you remember the details. When you are memorizing problems, do not just read them to yourself, DO them in your head.

Test Yourself - Many times students do not do well because they stop memorizing their notes when they get tired, and never test themselves to see if they actually can remember all of the material. Once you have rewritten and condensed your notes, you can start to memorize them.

- Start by reading over your whole stack of cards or notes.
- When you finish cover up the first page/card and see if you can remember everything that is on it. Describe or recite the content to yourself as you do this.
- Check the note page or card. If everything is accounted for move onto the next page or card. Do this until the stack is completed.
- Make sure you can remember everything the day before or several hours prior to the exam. It also helps to do this just before you go to sleep
- Just before the exam refresh yourself by going over your notes again. This is another check to see if you remember everything.