

Study Tips for Chemistry Students

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Whether you're planning to become a nuclear scientist or a poet, high school success requires that you do well in your chemistry class. So when test time rolls around, chemistry had better not seem like a foreign language. Read on for a few tips on dealing with the challenges of chemistry...

Chemistry and Math

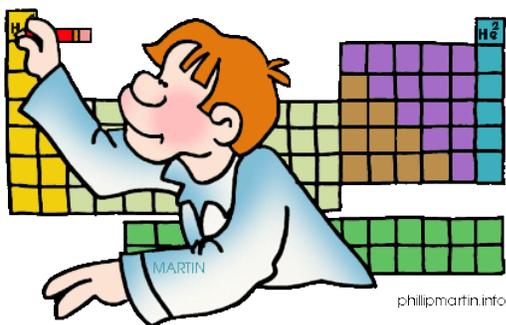
Nearly all high school chemistry classes require students to know some basic math. If you are asked to find the equilibrium constant of a reaction, you'll need to know basic algebra and how to divide fractions and calculate exponential numbers. If you're given the concentration of hydrogen ions in an aqueous solution and are asked to find the pH, you'll need to know logarithms.

To succeed in chemistry, you need to make sure you understand the underlying mathematical principles.

Your calculator will churn out the correct answers only if you plug the correct numbers into the correct equations.

If your math skills are shaky, it will be worth your time to meet with a tutor or visit your teacher for extra help.

Ignoring the mathematical demands of chemistry is not a viable option if you want to succeed in the class.



Constant Effort

If you ask graduates about the most difficult course they took in high school, many will say chemistry. This isn't surprising—most chemistry courses require students to master difficult concepts and chemical equations, specialized terminology, applied mathematics and demanding laboratory work. Even students who did well in biology class often find that their chemistry course covers more material in less time, provides less hand-holding and demands far more discipline and self-motivation.

Because of the demands of the course, successful chemistry students don't wait until exam time to begin studying. Instead, they **consistently follow the rule that every hour spent in class requires two to three hours of effort outside of class.**

As an example, let's say you've just been assigned reading on Lewis diagrams. Don't let a day go by without learning how to write and interpret Lewis diagrams. Future work will most likely use these bonding diagrams, and they are likely to reappear in homework, quizzes and exams. Procrastination doesn't simply mean that you won't understand Lewis diagrams—you'll also be lost for every subsequent reading and class that employs these diagrams.

Procrastination in a chemistry course can quickly prove disastrous—failure to learn basic principles can make all future material seem nearly incomprehensible.

Study Tips for Chemistry Students

Read With the Test in Mind

The best students put their effort into learning, not worrying, about tests. Nevertheless, if you continually ask yourself as you read what material is likely to be on the test, you'll find that your reading becomes more focused and productive.

It's easy to let your eyes glaze over and your brain shut down as you read your chemistry textbook. Let's face it; science books make rather poor beach reading. And if you find that you're moving your eyes over the page without absorbing any information, you're not reading. You're wasting time.

To read effectively, you need to be an *active* reader. That is, you need to engage the ideas in the book, not just passively move your eyes over the words. To read actively, heed this advice:

Constantly ask questions. What terms are important? What equations are essential for solving problems? What are the central ideas in this chapter? What other forms might this equation take? What types of problems can be solved with this equation? The results are measured in what units? Which variables are known and which are unknown? How does this material relate to what I learned earlier in the marking period?

Take good reading notes. Don't simply scan your book. Write out important terms and definitions. Create a study outline of essential concepts, equations and reactions.

Work through all the problems presented in the textbook. Problem solving is what you'll be doing at exam time, so it is what you should be practicing when reading.

Discuss the reading. Talk through the material with a classmate—you'll remember it far better if you talk about it than if you simply read it.

Identify points of confusion. If something in the book doesn't make sense to you, mark it. Raise your questions in class or during your teacher's office hours.

Develop Your Problem-Solving Skills

Chemistry is all about problem solving. Given limited information, you need to determine how a reaction will progress, how much product will be created, what a solution's temperature or pH will be, what conditions will create equilibrium, or how much of a chemical is needed to get a desired result. You need to know what will react with what and why.

The surest way to develop your problem-solving skills is to solve lots of problems. Work through every problem in your textbook, homework assignments and study guides. Use the **ACE** method: **A**nalyze, **C**alculate, **E**valuate. Rework the problems your teacher puts on the board—you'll learn the material by doing it, not by watching someone else do it. If your teacher provides practice materials, use them to test yourself. If you can get your hands on other chemistry books, work the problems presented there.

Finally, **make sure you solve problems productively.** Your goal is to be able to work through a chemistry question without any assistance. If you are constantly turning to answer sheets or seeking help prematurely, you'll be unprepared for the exam when that help isn't available to you.



Study Tips for Chemistry Students

Memorize

Chemistry, especially organic, requires lots of memorization. When test time rolls around, you don't want to be confusing amides with amines or imides. You'll also want to make sure you know specialized terms like stoichiometry, coefficient and molarity.

Here are several tips for locking important information into your long-term memory:

- Whenever you are reading the textbook or taking notes in lecture, **write down and highlight unfamiliar terms**. Review these terms frequently.
- **Create a set of flashcards** that have equations, reactions, terms or compounds on one side and a description on the other. Use these cards to test yourself regularly.
- **Learn important prefixes and suffixes**. You'll quickly be able to identify and diagram compounds once you learn characteristic groups such as -amine, -one, oxy- and hydroxy-.
- **Develop mnemonics** to help you remember. For example, **N**ick the **C**amel ate a **C**lam for **S**upper in **P**hoenix is a mnemonic for remembering the formulas for the ions nitrate, carbonate, chlorate, sulfate, and phosphate. This mnemonic also gives the charge on the ions.
- **Speak and live chemistry**. If you can use chemistry concepts and terminology in your day-to-day routine, you will quickly internalize and remember the material.

Ten Tips for Chemistry Success

1. **Think electrons**. How many electrons are there? What are they doing and why? Once you can think on a molecular level, the reactions you study will make more sense and you'll be less dependent on memorization.
2. **Keep up with the reading**. If you've done the reading before lecture, the classroom experience will reinforce what you learned from the textbook.
3. **Go to every class and lab**. A missed class is a missed opportunity to hear difficult concepts explained, see demonstrations of chemical processes and learn what material your teacher thinks is most important.
4. **Rework your notes after class**. Explain things in your own words and use the textbook to fill in any gaps.
5. **Study daily**. Create flashcards and study outlines that you can use during free moments to learn equations, master terminology, identify compounds and test your knowledge.
6. **Practice, practice, practice**. Work all the problems in your textbook and homework assignments. Work through exams from previous years if they are available.
7. **Get answers to your questions**. If you've spent some time with a problem and are still confused, seek help from a classmate, tutor or your teacher. If you start to lose your grasp of the material, your chemistry class can quickly spiral out of control.
8. **Don't work in isolation**. Chemistry is a challenge for nearly everyone. Form a study group with some classmates. Studying will be more fun, and members of the group will help motivate each other.
9. **Make your learning active**. Talk through a problem. Write it on the board. Get together with a friend and quiz each other. Create diagrams or mnemonics to help you remember material. Use a three-dimensional model to help you visualize a molecule.
10. **Eat and sleep well before an exam**. You want to make sure the biochemical processes in your brain are working well.

