

10 tips for success in A-level Chemistry

A-level Chemistry can be tough. It's also what can be classified as a 'step subject', which means that although it may be packaged up as differently themed topics, content in the earlier units underpins that in the latter ones. This is why atomic structure and quantitative chemistry (mole calculations, etc.) often come right at the start of the course – you're not going to be able to calculate the yield of an organic synthesis without understanding what atoms and moles are!

This means that you need to approach your course in the right manner from the get-go, and here are some tips to help.

1. The specification is your friend

Do you know what an A-level specification is or how to find it? If not, you want to find out pronto (okay, just look on your exam board's website – it's no secret!). The specification is where your exam board details the content that you must learn. Take a moment to digest this: although the questions in the exams may ask you to apply the content in unfamiliar scenarios, they can't ask you about topics that aren't on the specification. Now, don't get me wrong, you should expose yourself to as much chemistry as you can throughout your A-level course, as this will make you a better chemist, but you should be ruthless in your knowledge of what is and isn't on the specification, firstly to ensure that you have covered everything you need to know, and secondly to get inside the examiner's head when it comes to answering questions. POV: *What's the topic being tested here and what am I supposed to know about it? Oh, yeah, funny they've asked it like that, but that must be the answer...*

Remember the revision guides you had at GCSE? Well, they were just the specification written in colour with some fancy pictures. If you don't believe me, look up the specification and compare it to your GCSE revision guide – I bet it's exactly the same wording!

Which takes me onto my second point...

2. Do not rely on revision guides: speak your own language

Your school may have done you a wrong-un here, as at GCSE you were probably not encouraged to keep a revision-ready set of notes and relied on revision guides to do the hard work for you. I'm not criticising your school, as they were only trying to help, but this is going to make A-level Chemistry a whole load harder! Fact: the revision guides at A-level may get you a C grade. To achieve higher than this, you need to speak your own language. In the exam, you're going to have to use the technical language your exam board dictates, but everyone conceptualises scientific concepts slightly differently in their mind – your view of a covalent bond

being formed will look very different to how mine does, and that's okay! What you need to do is to capture your conceptual view and what makes sense to you in your own set of notes. You cannot use a revision guide (or someone else's notes) as a substitute. Once you've seen what sort of hand-outs your teacher will be giving you, you need to decide how you are going to organise your notes into a form that you can revise from. By the way, you want to do this straight away after a lesson, as it will help to digest the content, and it speeds up revision later on. In fact, when I ran a Sixth Form, I put 'revision' on the dirty word list. The very notion of revision suggests that you should delay learning for when you need to remember it for the exam. But you can't promote long-term learning this way, and you can't develop the skills you need to develop if you do this the day before the exam. If your teacher says you need to know your solubility rules for the exam, learn them that night!

3. Know your synoptic topics, and give them the respect they deserve

Ask your teacher if there any topics that they feel are examined in a particularly synoptic way (incorporate learning across the whole course). This is where students often fall down. You want to be making a separate set of revision notes for these topics – one that grows over time, adding on content as you cover it throughout the course.

The best example of this is organic reactions. By the end of the course, you will have met 20-30 different organic conversions, and you will likely have organic synthesis questions that ask you how to convert one unfamiliar molecule into another, drawing upon this toolkit of organic reactions. You also need to know all of the reagents and conditions for the reactions. For the average student, these questions are tough; for the A* student, who has been creating a reaction map of all of the organic reactions as they meet them throughout the course, this is a piece of cake. [Compound Interest](#) has a great example of the type of reaction map I'm talking about here.

4. It's all about application

And not re-writing notes! This is the very worst way to learn, and if you do it, stop! You need to be practising questions to develop the skills needed for the exam – and also just to fully understand a topic. Even the simplest form of practice, active recall, promotes long-term learning better than re-reading re-writing notes.

Now, you'll need a bank of questions, preferably sorted by topic, where you can go to get examples to practice, and when you make mistakes, you'll want to do even more of those type of questions. Your teachers will know where to get these, and they may even subscribe to a service where they can search for questions by keyword. Ask them – they'll love a student being proactive and taking charge of their own learning!

And while you're at it...

5. Learn the language of mark schemes

At the start of a mark scheme for an exam, there is a list of symbols and explanations for marking. Spend some time reviewing these terms so that you don't confuse them. 'Ignore', for instance, doesn't mean that the answer is wrong, it's just that it doesn't relate closely enough to the question to be mark-worthy.

6. And learn mark-worthy points from mark schemes

I hate myself for including this, as it should be all about the chemistry, but you would be well advised to take a very close look at what mark-worthy points the exam board credits, especially for longer answer (e.g. 6 mark) questions that are mainly factual recall. For example, you'll probably have to know how to describe the process of recrystallisation for purifying an organic solid. Now, there are a lot of points you can make, but the exam board will have its favourite points that it wants you to write to gain marks. Learn these and highlight them in your notes.

7. Use Chemguide as a second textbook

You will likely have been given an exam board-specific textbook, and be careful to use the technical language they have used. For instance, the same intermolecular force that involves temporary dipoles in one molecule inducing dipoles in neighbouring molecules can be known as instantaneous-dipole induced-dipole bonds, dispersion forces, London forces and van der Waals forces, depending on which exam board you are using. However, limiting yourself to one textbook limits understanding. You want to read several explanations of a concept to really understand it, and maybe one will resonate far stronger with you. So which extra textbook, I hear you ask! Luckily, you don't need to pay for one: use www.chemguide.co.uk. Jim Clark has done such a fantastic job translating his extensive teaching experience into one website, where he ensures that he covers all explanations for all exam boards, and even points out where there are differences. He also goes into more depth when the A-level course leaves you hanging. This is a must-use resource. To confirm, I have no affiliation with Jim, but in using his site for over a decade, I have never been disappointed or even found a single mistake! If you do, tell him: he'll be grateful!

8. Examiners are lazy: check out other exam boards

If you've looked at any past papers for your exam board, you'll find certain questions tend to repeat themselves. This is because it is hard to think of novel questions for content that's been the same for years! So where do examiners get inspiration from? Well, one source is other examiners! As you get closer to the exam and start to exhaust sources of questions from your exam board, check out other exam boards. This will give you exposure to differently worded questions, which will be more challenging, but critically, it will help you develop strong reasoning skills that will be crucial for answering the differentiator questions that your exam board sets that are aimed at higher ability students.

And on that note...

9. Enter the Chemistry Olympiad

Well, don't just enter it, practice for it. If your school doesn't have preparatory sessions, get together with similarly minded students and set one up. Try a question as a group each week one lunchtime – your chemical reasoning will go through the roof. Very helpfully, the Royal Society for Chemistry provide resources online for training, including worked solutions. Access them [here](#).

Ask your teacher if your school enters students. It's free to enter, but they will need a couple of hours to mark the Round 1 test.

10. And finally, revise smart...

With over 15 years of teaching chemistry, I've seen good and bad revision. What I've tried to distil here (yes, the pun was intended!) is the 'perfect' (if there is one) revision procedure for A-level Chemistry (but it probably works for at least all other Science A-level subjects, and probably many others).

Here we go...

- Nearing the time that you will start formal revision, read over all of the notes and hand-outs that you have in your beautifully presented folder.
- For each topic, take a sheet of A3 paper, and in the centre, stick an A5 version of the specification for that topic (you'll need to chop it up).
- Go through the specification point by point, and try to write notes for each specification point. Check you've covered the key points by referring to your notes, and amend as appropriate. For specification points where you were far less sure, go and learn these properly using your textbook, own notes, etc., and then demonstrate your understanding by adding notes to your revision sheet without any help. Repeat this learning process until you can do this confidently.
- Now go through your class notes and look for work and tests where you received feedback on things you got wrong or could have done better (use your Learning Points sheets). Add these points to the relevant specification points, perhaps in a different colour.
- Now you're ready to try some past paper questions. Use the mark schemes to check your answers. If there's anything you learn here, add this to the relevant point(s) on the specification on your revision sheet. Again, using a different colour might help.

As I see it, there are several advantages to this approach over ploughing through your class notes or textbook from beginning to end.

- It ensures that you cover everything you need to know and nothing else, since you won't be tested on things not on the specification.
- It allows you to review what you do know and not waste time revising areas of strength.

- The focus on the specification should allow you to get into the examiner's head (see above)
- It forces you to learn from your mistakes, be that through the course of the year or at the end of revision when doing past papers.
- You end up summarising a whole unit on a couple of sheets of A3 paper, which is a personalised, pared-down summary that hopefully can be learnt in the time available to you.

Good luck!