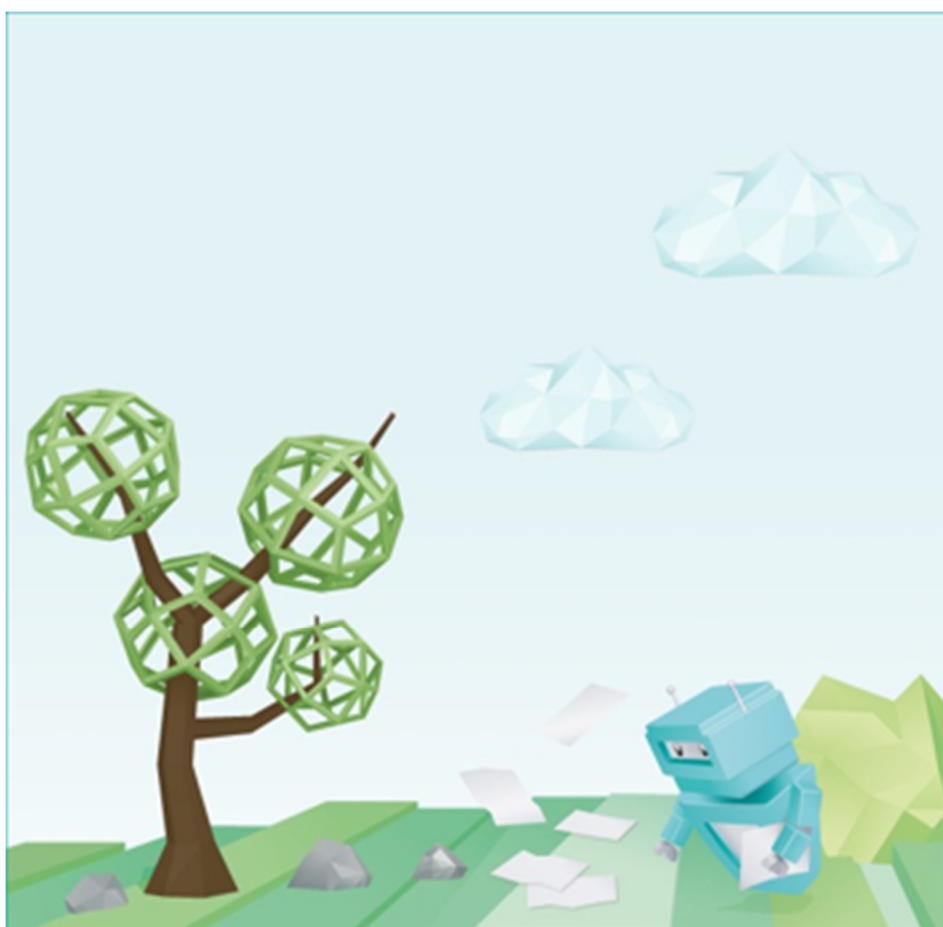


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Chemistry

How to get a H1 in the Leaving Cert
Chemistry Exam



by Elsa H.

Elsa got a H1 in her higher Leaving Cert Chemistry paper. She's now doing Medicine at Cardiff University. Here she shares what she learned.

The reasons for keeping on Chemistry tend to vary from student to student; some enjoyed aspects of the subject covered in Junior Cert Science, more need it as a requirement for their desired course and there is definitely a small minority who made up their mind after the 1st season of 'Breaking Bad'. Personally, I think I was a combination of all 3!

While it is a fascinating subject, it is by no means an easy one! Luckily for all of you Leaving Cert Chemistry students, it is a subject that will always, always reward dedication and hard work. Regardless of whether you have loved the subject since the beginning of 5th year or you're secretly counting down the days until you can throw away your textbook forever, a clever exam strategy and an efficient method of study will ensure that you can go into that exam knowing that a high grade is within your reach.

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Exam Layout and Timing

- **Exam Layout:** There are 11 questions in total on the Leaving Cert Higher Level paper, of which **8** must be attempted.
 - The entire paper is worth 400 marks which results in each question being worth **50 marks**.
 - There are 2 sections to the paper:
 - **Section A** consists of 3 questions and relates to the 28 mandatory experiments covered on the course.
 - **Section B** contains questions 4-11 which are based on all other theoretical chapters.
 - It is vital to know that **at least two** of your questions must come from Section A
- **Timing** The exam lasts **3 hours** which gives you an estimated time of **20 minutes** per question. I personally found that this was a good time to stick to but as you start attempting exam papers you will realise that you can fly through some questions within 10 minutes while a weirdly phrased question or a difficult calculation may leave you spending 25 minutes on another. It is critical that you do not spend more than 25 minutes on any question as your other questions will definitely suffer. I'd advise moving on to the next question and making it a priority to go back to at the end if you have time.

Sticking to this time frame will of course leave **20 minutes to spare**. I strongly recommend that this time is divided into 10 minutes for the beginning and end of the exam. The first 10 minutes allows you to read the paper, get your head in the right space and narrow down the questions you are going to approach. The final 10 minutes should be spent reading through your script, ensuring you have not accidentally left out any questions or made small mistakes that you will be kicking yourself for after the exam.



Section A

As I already mentioned, Section A consists of **3 questions** that are based on the mandatory experiments on the curriculum. While 2 must be attempted, you have the option of doing all 3 questions. This makes spending time and concentration on the experiments very worthwhile as it can be worth up to 38% of your exam.

- **Question 1** is based on your **titrations and volumetric analysis**. It consists of a possible 9 titrations and as well as the preparation of the standard solutions. These come from the **acid base, oxidation reduction and water** chapters and all have their own associated calculations.

Question 1 is extremely popular because the general questions asked tend to be quite repetitive and with a bit of calculation practice it could end up being your best question.

The **general titration procedure** is an almost guaranteed short question and can often be worth up to 12 marks. A knowledge of how to prepare a pipette, burette etc. can be easy marks for everyone! The **calculations** have started to become less straightforward in recent years and that is why I'd advise doing some practise calculations from your textbook/ exam papers to make sure they're something that you can breeze through in minimal time on the day.

- **Question 2** is based on your 8 **Organic Experiments**. These experiments are a big part of Organic chemistry as a whole, so it would be a good idea to keep on top of them as you're going through them in class. It's very easy to start mixing up the parts to each experiment and that is why I found it useful to make notes for each one which included a rough guide of the procedure, chemicals, apparatus etc.

It is definitely not a question to rule out as the experiments themselves are actually fine once you process them all. They can also show up in later questions so having an understanding of the organic experiments will be to your advantage regardless.

- [Question 3](#) is based on the remaining mandatory experiments. There's a big variation in these experiments as they come from different chapters but that doesn't make them any more difficult. Most of them are straightforward and the exam papers tend to be quite repetitive. It tends to be a very approachable question if you have spent the time doing exam papers and feel you have a good understanding of what could be asked on each experiment.
- As there are so many possible experiments, it is tempting to narrow down and predict what experiments might possibly come up. I'll admit that in the weeks coming up to my leaving cert I did begin to look into what experiments seemed more likely to appear based on previous years, but I would never recommend completely boycotting certain experiments because you have a feeling they won't show up! The experiments are beginning to appear more and more as parts of Section B as well, making them an unavoidable part of your study.

On the following page, there is a list of the mandatory experiments divided into how they generally appear on the paper:



Question 1 – Titrations

Acid Base

1. To prepare a standard solution of Anhydrous Sodium Carbonate
2. To use a standard solution of sodium carbonate to standardise a given hydrochloric acid solution
3. To determine the concentration of ethanoic acid in vinegar
4. To determine the amount of water crystallisation in hydrated sodium carbonate

Oxidation-Reduction

5. To prepare a standard solution of Ammonium Iron (II) Sulfate and to use this solution to standardise a solution of potassium permanganate
6. To determine the amount of iron in an iron tablet
7. To prepare a solution of Sodium Thiosulfate and to standardise it by titration against a solution of iodine
8. To determine the percentage (w/v) of Sodium Hypochlorite in bleach

Water

9. Estimation of total hardness of a water sample
10. Estimation of dissolved oxygen by redox titration



Question 2 - Organic

1. Preparation and properties of ethane
2. Preparation and properties of ethane
3. A. To extract clove oil from cloves by steam distillation
B. To isolate eugenol from an emulsion of clove oil and water by solvent extraction
4. To prepare a sample of soap
5. A. Properties of ethanol
B. Properties of ethanoic acid
6. Preparation of Benzoic acid from phenyl methanol
7. Recrystallise Benzoic Acid and determine its melting point
8. To separate a mixture of indicators or coloured substances

Using paper/ thin layer/ column chromatography



Question 3 - Mixed

1. Flame Tests
2. Test for Anions
3. To measure the relative molecular mass of a volatile liquid
4. Oxidation-Reduction reactions:
 - A. Halogens as oxidising agents
 - B. Displacement reactions of metals
5. Determination of the heat of reaction of hydrochloric acid and Sodium hydroxide
6. Measuring the rate of production of oxygen from hydrogen Peroxide
7. To study the effect on reaction rate of concentration and temperature
8. Equilibrium experiments to illustrate Le Chatlier's principle
9. Determination of the concentration of free chlorine in swimming pool water or bleach
10. Determination in water of total suspended solids, total dissolved solids and pH



Section B

Section B is broken down into **8 questions**; Question 4-11. These questions aim to cover all aspects of the course and are perhaps less predictable than the experiments. That said, some of the questions tend to follow a general pattern as to which chapters might appear.

If you answered all 3 of the questions from Section A then you will only have to choose 5 from B, otherwise you will have to attempt 6.

- **Question 4** consists of 11 short questions, of which 8 must be answered. The majority of these questions won't take long to answer so I'd advise to attempt all 11 if possible and you'll receive marks for your best 8. You have room to make one or two small mistakes and for this reason it is a popular question that tends to be answered quite well. These short questions are generally based on the whole course which may seem daunting but once you start flicking through exam papers you'll realise that the nature of the questions tend to be quite repetitive.
- **Question 5** is likely to be based on the first few chapters you covered in 5th year Chemistry. These include Atomic Theory, the Periodic Table, Radioactivity and Chemical Bonding. I consider these chapters to be the foundation of the Chemistry course; it's hard to progress onto the likes of organic or rates of reaction without a good understanding of the principle chapters. That's why the topics above should be very familiar to you by the time the exam comes around, making question 5 a very approachable question at the best of times.
- **Question 6** is generally based on the Fuels and Thermochemistry section of Organic Chemistry but can also include other aspects of the organic chapters. I personally found these questions to be quite repetitive going through them, but that said, you definitely need to know your



stuff if you plan on attempting this question! I found the fuels and heats of reaction a worthwhile one to focus on as I wanted it as an option on the day but it's a long chapter that definitely can't be bluffed in the exam. Put some extra time into it when you're doing it in class and you'll be grateful once June comes around.

- [Question 7, 8, 9](#) are less predictable when it comes to what chapters might come up. An **organic question** tends to appear in one of 7, 8 or 9 which again makes it an extremely worthwhile part of your study. Other topics that tend to feature include Water, Acid-base Theory, pH, Rates of Reaction or Equilibrium. They may appear as full questions or as a section of a long question.
- [Question 10 & 11](#) both contain a built-in choice where two parts out of A, B or C must be answered. The topics covered in A and B can vary while Q11(c) features **the option**. I would have always found the 25 mark sections in 10 or 11 very approachable as it is never going to be a full 50-mark question on one topic alone.

If time allows, many teachers decide to cover **optional chapters** which allows you to attempt Q11 c. Luckily, we studied Option 1 in class, which consists of industrial and atmospheric chemistry. It was definitely one of the easier chapters and once again, the general questions asked show little variation. If you are fortunate enough to cover it with your teacher, I wouldn't rule it out as a possible question; minimal study for a guaranteed question might be your saviour if the other questions don't suit you on the day!



Some Final Tips

- ✓ **Understand the Curriculum:** While questions can be repeated and a high percentage of marks often goes towards formulas and definitions, Chemistry is by no means a subject that can be rote learned. There will always be questions thrown in to distinguish between an A or a B student and developing an understanding of the topics covered in class is important to ensure you are prepared for any curveballs thrown at you in the exam.

I'm not saying that you have to start reading university papers or watching chemistry documentaries to get a good grade; I would just avoid learning off an A4 page of notes with no understanding of the underlying concept. I found that just by listening to my teacher's explanation in class, followed by an occasional read through my textbook allowed me to comprehend the wider principles before focusing on the key points in my notes.

- ✓ **Participate in Class:** Like any subject, by actually listening in your classes and making an effort to understand the notes as you're taking them down will save you half the time when it comes to trying to learn them at home. It is inevitable that you'll find some parts difficult and things are going to go over your head but don't be afraid to start asking relevant questions as they come to mind; the reality is that half your class is probably wondering the same thing!

Your teacher should know the course inside out so they can essentially be your best resource if you have any confusion. It's a lot quicker to ask a question as your covering it in class as opposed to spending time trawling through a textbook or google a week later trying to find the same answer.



- ✓ **Experiments:** All you have to do is read through the break-down of the exam to understand the importance of the experiments. I didn't really cop on to the fact that they could make up at least 38% of your exam until the start of 6th year; straight away I started putting together an experiments folder which included a photocopy from my textbook or ReviseWise, highlighting the main method, diagrams apparatus/chemicals etc.

While the experiments are separated into different chapters, I found it handy to keep them all together in one big folder, allowing me to study them as a whole. It does take some time to get your head around all of them but if you just spend half an hour or so on each one as it's covered in class it'll honestly make revising them for your class test (never mind say your mocks or your actual Leaving Cert) much easier!

- ✓ **Practise Calculations:** From chemical equilibrium to stoichiometry, calculations are going to make up a large part of your exam and that is why it is important to give them the time they deserve when studying. Once you have tried and understood all of the questions from past exam papers I'd even recommend looking at worked examples in your textbook or even trying a few from the workbook so that you are completely comfortable in the exam.

It is so important to present your calculations in an organised manner on your script; this makes it easier for you to answer the question and rectify any mistakes, while also making it easier for the examiner to correct it and identify where you may have possibly gone wrong. By including all of your calculations and keeping your figures to 3 decimal places this will maximise the amount of marks you can be awarded even if your final answer isn't correct.

- ✓ **Key Definitions and Terms:** These can honestly be such easy marks for even the struggling Chemistry students. Random definitions and principles simply need to be regurgitated in



seconds once you recognise the terms on the paper and require no form of lateral thinking. Yet, they still manage to horrify most students and can be brushed under the carpet until the weeks coming up to the exam.

The easiest way to learn all of the definitions, terms, formulas is to simply add them all to a small folder or highlight them in your notes in some way and just get it into your head quickly after you did it in class! It might take writing it out once or twice or repeating it in your head before you know them off by heart or write them without even thinking, but you'll surprise yourself with how easily you can remember them if you learn one or two at a time and revise them every so often.

- ✓ **Use Exam Papers:** You might know the course off by heart and can recite every page of your notes but, like most other subjects, studying past papers and their marking schemes is essentially where you're going to pick up the majority of your marks. This is where Studyclix is going to come in handy!

Once I learned my notes and felt confident with a chapter, I would then choose that topic on Studyclix and go through every question that's come up in relation to that chapter. The convenient drop down marking scheme allowed me to see where I might lose marks and what to include into my notes for future study.

You should become familiar with how different questions are marked by looking at key words such as 'name', 'explain' etc., so you know how much to write for each question in the exam. The exam questions relating to each topic should be fully understood by the time your Leaving Cert comes around as it usually demonstrates a good understanding of the course and means you will be able to easily answer the majority of the paper on the day.





Finally, I wish you all the very best of luck and I can guarantee that with a bit of work over the next few months, your dream grade is well within your reach.

