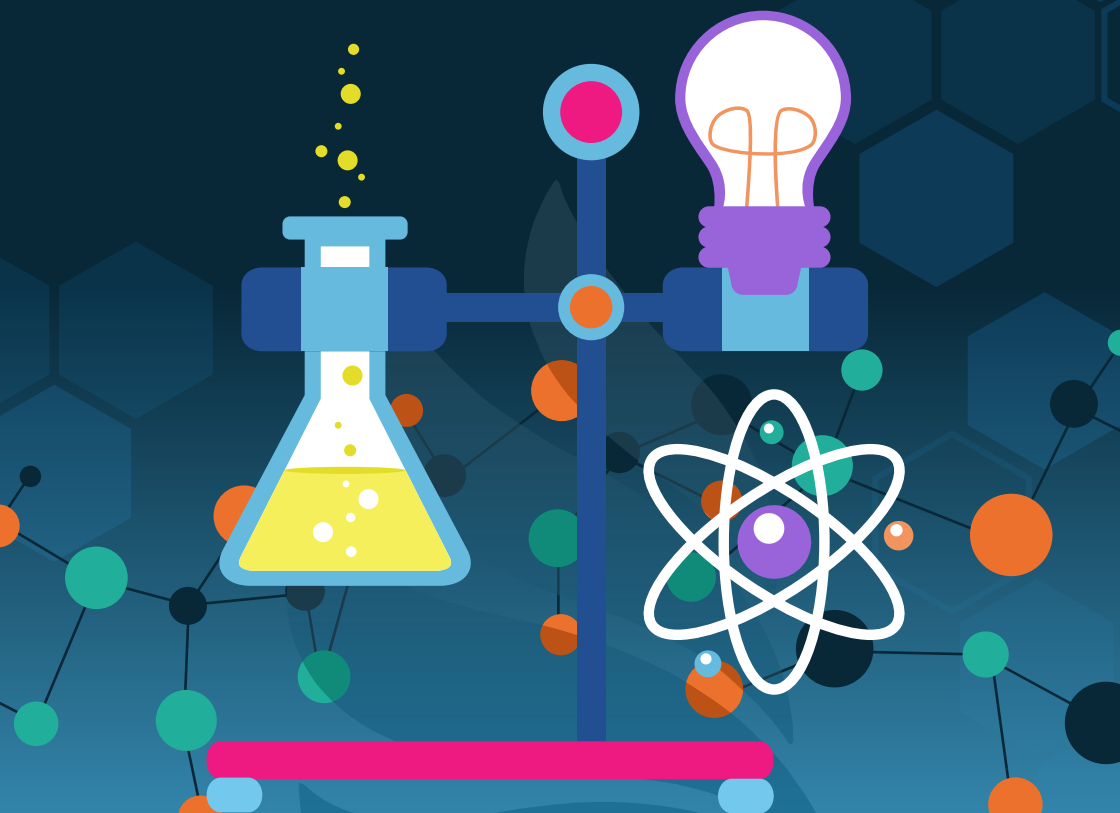


HOW TO REVISE IB CHEMISTRY



From the IB graduates at

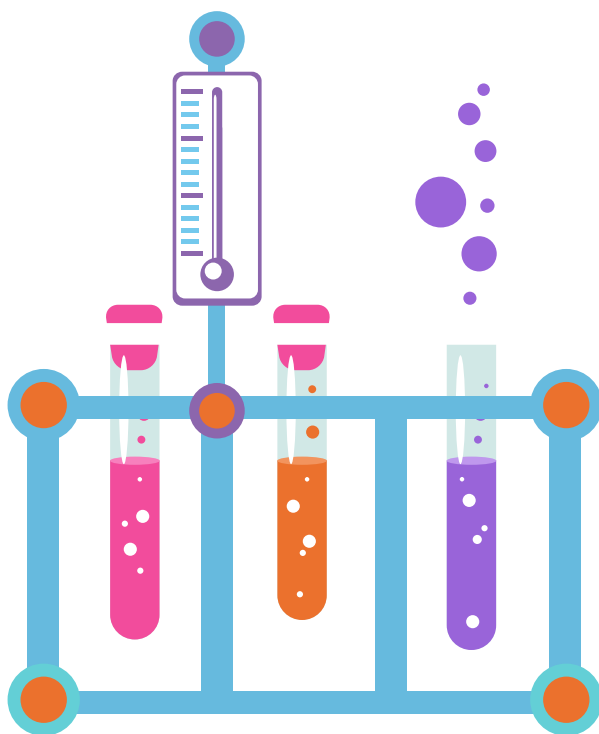


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Lanterna Chemistry Guide

Introduction:

IB Chemistry is one of the most difficult sciences that the IB offers. That being said, the main difficulty in chemistry lies in the sheer size of the syllabus, not necessarily in the individual topics being mind-bogglingly difficult. As such, we strongly believe at Lanterna that with the proper preparation and well thought out revision period, anyone is capable of scoring great scores on your final exams. That's what we're here to help you with! Follow this comprehensive guide and we think you'll be in a great place to ace your chemistry exams. In this guide, we'll walk you through the following:

- What you can expect to see on each of the papers
- What to think about in different types of questions
- How to revise each topic in the syllabus





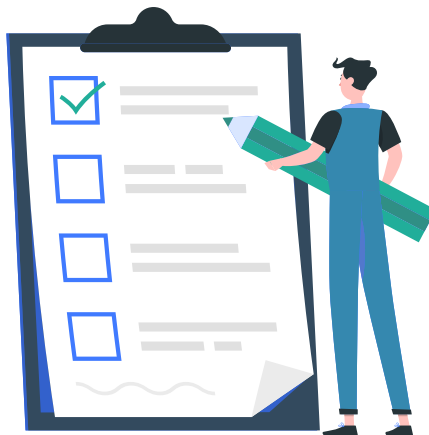
Paper 1: Multiple Choice

Facts about the Paper 1:

- It's worth 20% of your overall Chemistry grade
- No calculators allowed
- You are provided a periodic table
- You are given 45 minutes (SL) or 60 minutes (HL)

In the paper 1 you are given 30 (or 40 in HL) multiple choice questions. These multiple choice questions have 4 possible answers, of which 1 will be the correct answer. You gain 1 point for each correct answer and get no penalty for an incorrect answer. Thus,

the highest possible marks on a paper 1 is 30 (or 40) points. All core topics can be asked about in the paper 1, so there isn't any way to guess or predict what will be asked about on any given exam. So, how does one prepare for the paper 1 in the most effective way possible?



Tip #1: Know the Syllabus

The Syllabus should be your best friend as a chemistry student. As good as your teacher or a textbook may be, there will always be additional examples/information in their explanations that are not strictly relevant come your final exam. The syllabus, on the other hand, distills precisely what you can be expected to know on the exam, so it should be your first point of call when you start your studying for chemistry. By consulting the syllabus when doing your studying, you will make sure that every minute of your revision is on a topic that is probable to show up on the exam. So, how can we tailor our revision effectively with the use of the syllabus? Try the traffic light method.



Traffic light method:

At the start of your revision period, go through the syllabus with 3 highlighters in hand (green, yellow, and red). Comb through the syllabus bullet point by bullet point, highlighting the topics you are extremely comfortable with in green, the topics you struggle with in yellow, and the topics you've never seen before in red! This task might seem trivial, but in taking the time to go through the syllabus in this manner, you will achieve 2 vital things:

1. Identify the areas of the syllabus that you're struggling with or are unfamiliar with. These are the topics that you should start by revising. Try to make sure to get the entire syllabus to green/yellow.
2. Get an overview of the entire syllabus, clearly showing the examples you are expected to be familiar with, and which ones you can deprioritize in your revision.

Tip #2: Past Papers

When it comes to multiple choice questions doing past papers to review is the best possible practice. Although it may feel like there are too many topics to possibly know when you get down to the exam, you'll find that there are certain questions that the IB tends to ask in any given year. Our recommendation is that you take 5-10 past papers, and (once again) grab a set of highlighters. Go through each of the papers and highlight the questions, dividing them by topic. Highlight all stoichiometry questions in one colour, all atomic theory questions in another...

Instead of doing one past paper the whole way through, go through all past paper questions relating to one given topic in the syllabus. In this manner you will quickly notice similarities in the types of questions that the IB likes to ask on any given topic!

Tip #3: Eliminate Choices

The multiple choice questions in the chemistry exams are designed to make you think. As you are given 45 (or 60) minutes to answer 30 (or 40) questions, you should be expecting to spend 1.5-2 minutes on each question. This



implies that there are very few questions that you will be able to know the answer to straight away. Don't fret! Use the elimination method to logically whittle the 4 potential choices down! It's generally much easier to start by eliminating incorrect answers rather than choosing the correct one off the bat! Let us show you an example:

Which change has the greatest increase in entropy?

- A. $\text{CO}_2(\text{s}) \rightarrow \text{CO}_2(\text{g})$
- B. $\text{CO}_2(\text{g}) \rightarrow \text{CO}_2(\text{l})$
- C. $\text{CO}_2(\text{g}) \rightarrow \text{CO}_2(\text{s})$
- D. $\text{CO}_2(\text{l}) \rightarrow \text{CO}_2(\text{s})$

If you're familiar with the concept of entropy, you'll know that it describes the randomness and disorder of molecules. Naturally gases have the highest entropy, followed by liquids, followed by solids. As such, a transition from solid to liquid, liquid to gas, or solid to gas will represent large increases in entropy. State transitions going the other way would represent decreases in entropy.

Based on this understanding of entropy, we can easily eliminate option B as when going from a gas to liquid the atoms are becoming less disordered. Similarly, with option C, a transition from gas to solid, the atoms are also becoming less disordered. Last, option D, as the atoms are going from liquid to solid, the atoms are once again becoming less disordered. In fact, option A is the only answer that leads to an increase in entropy and is thus naturally the correct answer.





Paper 2: Short Answer and Extended-Response Questions

Facts about the Paper 2:

- It's worth 36% of your overall Chemistry grade if you're an HL student, and 40% if you're an SL student.
- Calculators are allowed
- You are provided a data booklet
- You are given 75 minutes (SL) or 135 minutes (HL)

In the paper 2 you are asked several questions and are required to answer ALL of the questions. Each question is broken down into many parts and subparts. For example, question 1 may have 1a, 1b, 1c, 1d. Each of these parts may be broken down further into questions 1a i), 1a ii), 1a iii) etc. Each question is worth anywhere from 1 to 3 marks. Similarly to the paper 1, you can be asked about any section of the syllabus on the paper 2, so there is no way of guessing what will appear on any given exam. As such, our tips will focus on strategies for answering the questions to give yourself the best possible chance at getting the grade you deserve!

Tip #1: Check the Marks

For each question you'll be shown how many marks you can potentially get on the question. Having a look at the marks that any question carries is crucial in your response to the question. The number of marks that a question is worth gives you an indication of how much (or how little) you're expected to write to pick up the maximum marks. A 1 mark question will likely only require a 1 sentence answer as the examiners will be looking for you to make 1 specific point. A 2 mark question, on the other hand, will often require you to make 2 distinct points and as such we recommend writing 2 sentences as a response.

Rule of thumb, in your answer to any question in paper 2, write as many sentences as the question is worth!

For example:

Question: Rhenium, Re, was the last element with a stable isotope to be isolated. The stable isotope of rhenium contains 110 neutrons. Before its



isolation, scientists predicted the existence of rhenium and some of its properties. Suggest the basis of these predictions. [2]

Answer: Scientists could predict the existence of rhenium and some of its properties as previously the element with atomic number 75 was unknown, which would have led to a gap in the periodic table. Since the periodic table shows regular/periodic trends in properties we can deduce the properties of Rhenium.

As you can see, since the question is worth 2 marks, we made sure to write 2 sentences making 2 separate points. Although this may not be strictly necessary to pick up all points, it is a good safeguard, making sure that you never under-answer a question!

Tip #2: Read the Full Question (RTFQ)

Too many chemistry students lose silly marks due to not answering the full question! As you can see in our example in the first tip, the questions asked about both the existence of Rhenium as well as some of its properties. A lot of students would disregard one of these points and focus their answer on just the existence, or just its properties. No matter the quality of your answer, if you didn't RTFQ you are giving away points that you could easily be picking up! Although you may feel stressed during the exam and feel like you don't have enough time to spend on every question, do yourself a favour and RTFQ before trying to answer it.

Tip #3: Move on if You're Stuck

Unlike many other IB exams, the questions in a chemistry paper 2 exam don't get progressively more difficult. You'll find easy and difficult questions scattered throughout the whole exam. As such, if you find yourself stuck on a particular question, don't fret! Move on to the next question which will undoubtedly be easier. Pick up the easy points on the exam before trying to tackle the most difficult question that you find yourself stuck on. Many students fail to get through the entire exam because of time constraints, leaving points on the table that they would have been able to pick up if they would have the time. Don't let this be you! Move on and pick up all easy points!



Tip #4: Make the Data Booklet your Best Friend

Sometimes it's difficult to know where to start with a question and that's where you can benefit from using the data booklet. Suppose you take the time to go back to a question that you were previously stuck on, try flipping through the data booklet to see if you can find something related to the question at hand! Perhaps a light bulb will go off, or just by writing down a related formula or equation you may pick up a point on a question even if you have no clue what's going on. Don't be afraid to use the resources given to you!





Paper 3: Data-Based and Short-Answer Questions + Option

Facts about the Paper 3:

- It's worth 24% of your overall Chemistry grade if you're an HL student, and 20% if you're an SL student.
- Calculators are allowed
- You are provided a data booklet
- You are given 75 minutes (SL) or 135 minutes (HL)
- You are tested on both the core of the syllabus as well as your option

Paper 3 is broken up into 2 sections: Section A and Section B. Section A is a data-based question and several short-answer question while Section B focuses on short-answer and extended-response questions based on the option. You must answer all questions in Section A and all questions relating to one of the options in Section B. The paper 3 is often mistakenly thought of students as the 'option' paper, completely forgetting about or disregarding section A, which is unrelated to the option. Section A is worth 33% of your paper 3 mark, so it is not one to be forgotten about! So how do you prepare for section A?

Tip #1: How to Approach Data-Based Questions

This may be the most difficult part of the entire chemistry exam to prepare for. Why? The examiners have free reigns to give you data and ask you to interpret topics from any part of the syllabus. You will most likely have to interpret some tabular or graphical data, so make sure to become comfortable with interpreting data presented in this way. Since the syllabus changed in 2016, there's been a common trend that the IB likes to ask about environmental question when it comes to the data-based question. This is not guaranteed, though, so don't take this as hard fact.

Here are some general guidelines to follow when it comes to interpreting data:

1. Similarly to Paper 2, make sure to RTFQ (Read the Full Question). Don't give away any silly marks because you neglected to answer all aspects of the question.
2. Make note of the axes labels, column headings etc. so that you are fully aware of what data you are truly interpreting.



3. Don't overthink the data. If there is a clear trend, state it. Don't try to force a trend or correlation between sets of data if it's not clearly visible in the graph/table.
4. Read all questions before starting the first one. All too many times students give the answers to parts b) or c) in question a). This is a waste of time as you'll have to rewrite your answer! Make sure you're aware of where the questions are leading you, and answer only the question you are asked!

The biggest note of all when it comes to the paper 3 is being familiar with the IB science command terms. The command terms are a list of words indicating the depth of answer required for any question. The command terms are broken up into AO1 (most surface level), AO2 (more in-depth), AO3 (most in-depth).

AO1	AO2	AO3
Classify	Annotate	Analyse
Define	Apply	Comment
Draw	Calculate	Compare
Label	Describe	Compare and Contrast
List	Distinguish	Construct
Measure	Estimate	Deduce
State	Formulate	Demonstrate
	Identify	Derive
	Outline	Design
		Determine
		Discuss
		Evaluate
		Examine
		Explain
		Explore
		Interpret
		Justify
		Predict
		Show
		Sketch
		Solve
		Suggest



Often students lose points by answering a slightly different question from the one posed. Describing a trend is very different to explaining one. Describing a trend just consists of observing a trend and its characteristics, while an explanation may give reasons behind the existence for the trend. Knowing this distinction can be key in picking up the full points to a question. How do you study for this? Go to the chemistry syllabus where you'll find the full list of command terms as well as their definitions. Make sure you're familiar with each one, and could classify each of them as AO1, AO2, or AO3!

Tip #2: Prepare for the Option

Many students get quite nervous or scared for the option. The main reason behind this fear lies in the lack of preparation that many schools provide for the option, telling you to self-study the option instead. Whilst this may seem like an impossible task, self-studying the option is fully possible. In fact, it may be the easiest part of your final exams to prepare for. Why? The option represents quite a small amount of information, yet you are asked questions amounting to a full 30 marks on the option. As such, it's relatively easy to predict what will show up on the exam, and you can be almost certain that all major topics in the option will be asked about on the final exam. So, how does one prepare optimally for the option? Past papers.

Past papers will give you an indication of the types of questions that the IB likes to ask about the option, but the reason we love using past papers as a way to prepare for the option is that you'll notice that the IB recycles questions when it comes to the option! As there isn't too much material to ask about, the questions tend to become quite similar year in and year out. Go through the past few years of papers and you will be fully familiar with the questions you can expect before even starting the exam!



Conclusion

So there you have it! Our top tips on how to get ready for the IB Chemistry exam! Follow our guidelines and make sure to put the hours into getting familiar with the key concepts and there should be no reason that you can't smash that final exam. If you're struggling with comprehending any specific topics in the syllabus, or the entire chemistry syllabus still feels like a great mystery, then you might want to consider checking out some online private tuition! Get an elite IB tutor from Lanterna who can walk you through any difficulties you have as well as providing you with mountains of study materials that will make your life so much easier as you gear up for final exams. Don't miss out on this opportunity!



Online Private Tuition

Receive one-on-one support from the comfort of your own home. Support whenever and wherever you need!



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Questions? Email us at info@lanternaeducation.com