

Guidance on the External Assessment

Tips for revision	2
Know the syllabus	2
Make learning notes	2
Make revision notes	3
Know what to expect for each exam	4
Use past papers to help you revise	5
Approaching the examinations	6
Suggestions on how to approach multiple-choice question papers	6
Introduction	6
Understanding multiple-choice questions	6
During the exam	6
Suggestions on how to approach papers with structured questions	7
Introduction	7
Tackling questions requiring extended answers	7
Advice on taking the exam	8
Skills needed to answer questions on all papers	9
Types of question	10
Calculation questions	10
Questions involving graphs	11
'Suggest' questions	11
Making comparisons	12
Drawing a diagram	12
Questions containing diagrams	12

TIPS FOR REVISION

Know the syllabus

The *International Baccalaureate* produces syllabuses for the Diploma Programme subjects. It is essential to familiarise yourself with what you are expected to know for the actual exams. Your class notes may contain extra background information to help you understand topics. Use the syllabus to extract the relevant points from class notes when you make **learning notes** (see below) and **revision notes**.

Syllabus sections are not all the same size. When planning your revision, allocate your revision time according to:

- the time allotted to that part of the syllabus by the syllabus guide
- the volume of learning
- how difficult each section has been for you.

Exam questions can present you with a situation in a new context. You will be able to tackle these questions more confidently if you can identify the relevant syllabus points that are being assessed. You will then need to apply your knowledge and understanding to answer the questions.

Make learning notes

Many students learn by repetition. As you learn, you can reduce your class notes:

class notes → **learning notes** → revision notes

Each time you complete a topic, it's helpful to go back through your class notes and organise them in a way that suits your style of learning, to make your learning notes. The topic could be part of an Understanding point or an Application. If you have found something particularly difficult, or it is a large section of the syllabus, you may need more notes than if you have found the concepts quite easy.

Learning notes are personal and specific to you. You can benefit from re-writing class notes using strategies that work for you – for example, using colours, flow diagrams, bullet points or concept maps.

To make learning notes:

- produce a shortened version of your class notes
- check your class notes against your coursebook
- leave out background, non-syllabus, information

- leave out, or reduce to a minimum, points that you know you will never forget; for example things you know from earlier courses
- avoid long, flowing sentences that contain many points; use bullet points or short sentences, each containing one or two points that are likely to gain marks in an exam – ‘mark points’
- use scientific terminology.

Many learning outcomes are linked to others within the syllabus. Your teacher may have covered topics in a different order from that in the published syllabus. This may also be a logical order for you. Make your learning notes for each topic on separate pieces of paper to put into your folder in your preferred order.

Making learning notes has benefits:

- repeating and reformatting class notes helps learning
- it is a first stage in revision for the exams
- notes are in your preferred style to optimise learning
- you can assess how well you understand each learning outcome.

Make revision notes

You will be trying to cope with other subjects as the exam time approaches, so a stack of learning notes that is as thick as a textbook is not helpful. You can reduce your notes further to make revision notes.

class notes → learning notes → **revision notes**

Be sensible in your approach:

- modify and reduce your learning notes – revision notes should contain only the detail necessary to get your very best grade
- assess for each topic how much you have increased your understanding and knowledge
- check whether you have changed your style of learning
- think about how you want to set out your revision notes
- think about whether there is a better method to use for revision notes than you have used before – you may get ideas from your friends
- incorporate your experience of past-paper practice questions and their mark schemes into your notes

- get revision notes ready for one topic area and then try them out to see if you can revise from them successfully.

Know what to expect for each exam

Before you enter the exam room, you should know what to expect in the exam paper. Exam papers have different types of questions, including multiple-choice, short-answer questions and extended-answer questions. It is important to know how long the exam lasts and how many questions you need to answer.

	Standard Level		
	Paper 1	Paper 2	Paper 3
Duration (h)	0.75	1.25	1.00
Proportion of total mark	20%	40%	20% *
Questions to be answered	All 30 multiple-choice questions on SL core	• short-answer and extended-response questions covering SL material	<ul style="list-style-type: none"> • short-answer questions on experimental work; one data-based question in section A • short-answer and extended-response questions from one option in section B

* remaining marks for the final assessment are derived from the internal assessment

	Higher Level		
	Paper 1	Paper 2	Paper 3
Duration (h)	1.00	2.25	1.25
Proportion of total mark	20%	36%	24% *
Questions to be answered	All 40 multiple-choice questions on core and AHL	• short-answer and extended-response questions covering SL and HL material	<ul style="list-style-type: none"> • short-answer questions on experimental work; one data-based question in section A • short-answer and extended-response questions from one option in section B

* remaining marks for the final assessment are derived from the internal assessment



Apart from multiple-choice questions, it is rare for questions to be worded as straightforward questions with question marks. They generally have 'command terms'.

A list with explanations of the most common command terms that you should understand is in the syllabus. Make sure you know exactly what is required for each command term.

Command terms that appear frequently in questions are:

- calculate
- compare
- describe
- discuss
- explain
- list
- outline
- state
- suggest.

Command verbs relate to the three assessment objectives:

1. Demonstrate knowledge and understanding
2. Apply
3. Formulate, analyse and evaluate

The objective determines the level of detail and depth expected in your answer. Learn the difference between the three levels of objectives. These are defined in the Glossary of command terms on p154–156 of the syllabus.

Use past papers to help you revise

You will find it helpful to look at or practise past exam papers. Your teachers may have copies of past papers and mark schemes. Note that the mark schemes for many questions contain more mark points than the total mark allocated. This is because mark schemes accommodate all the various ways a topic may be taught. You are not expected to be familiar with all the mark points. For each question, just check that you know enough of the points to do well.

APPROACHING THE EXAMINATIONS

Suggestions on how to approach multiple-choice question papers

Introduction

Points to note:

- some questions will be fairly straightforward and should not take much time, as they assess knowledge and understanding directly based on syllabus learning outcomes
- some questions may expect you to use your knowledge and understanding from a number of different learning outcomes, so keep an open mind
- you will need more time to concentrate on questions that require calculations, analysis, problem solving or application of knowledge
- no calculators are permitted for the multiple-choice paper.

Understanding multiple-choice questions

Each question may be posed on its own or may be preceded by some information. There are four answer options: **A**, **B**, **C** and **D**. You must choose which one is the correct answer or is the best answer of the four options.

Some questions have a simple construction in which the options **A**, **B**, **C** and **D** appear directly below the question. The options could be one or more sentences long. Other questions have a construction in which each option is a row in a headed table.

Some questions have a more complex construction, in which you are given a number of statements to read, usually marked as I, II, III, etc. Each of the options **A** to **D** then offers you a particular combination of the numbered statements, and you have to decide which combination is correct. Remember that according to the new syllabus, Paper 1 will contain objective 3 questions, i.e. questions requiring multiple-step calculations or arguments. This is a new feature of Paper 1.

During the exam

When tackling questions:

- read questions through more than once
- pay particular attention to the wording of the question – for example, are you being asked which of the four options is correct, or which is **not** correct?
- For questions that assess topics that you find difficult, try to recall the relevant section of your revision notes before looking at the options (**A**, **B**, **C** and **D**) available.
- never leave a gap on a multiple-choice answer grid – if you really do not know the answer just guess – there is no negative marking.



- never mark more than one answer for a particular question as correct – this will be marked wrong.

When choosing the correct answer:

- if the answer is not obvious, try to use a process of elimination to decrease your choices and increase your chance of success
- carefully read the wording in the options – on quick reading, a statement can appear to be correct, but with more analysis you may spot something that is incorrect
- stay confident when you have used correct reasoning to choose an option – do not let other options that appear to have impressive wording distract you
- if option **A** appears to be correct, read on and check the others before you confirm your choice
- do not look at the pattern of answers (**A, B, C** and **D**) on the answer sheet to predict the correct option – you cannot expect there to be an equal number of each option letter in the whole exam.

SUGGESTIONS ON HOW TO APPROACH PAPERS WITH STRUCTURED QUESTIONS

Introduction

During Papers 2 and 3 of the exam is not the time to work out your preferred strategy for coping with exam papers with structured questions. If you can, practise past papers beforehand and try different exam approaches to see what is best for you.

Exam papers aren't long enough to test your knowledge and understanding of all the learning outcomes. Ensure that you have revised well and are prepared for your less favourite topics to turn up in the exam. In both of the papers, each main question can assess topics from more than one syllabus section.

Tackling questions requiring extended answers

In Paper 2 and section B of Paper 3 you need to decide when and how to tackle the questions that require an extended answer. Think about the following statements and how they can help you to decide your strategy to choose and answer the extended-response question.

'I have revised well but if I do structured questions first, I am the sort of person who may forget the topic areas assessed in the extended-response question.'

- Consider doing the extended-response questions first.

- Alternatively, write out a plan for the extended-response questions first, to remind you of the main points later after you have completed the other questions.

'I want to settle into the exam before I write an extended response, as I find these more difficult.'

- Do the short-answer and/or data questions first so that you know you have already built up marks, and then you can work with more confidence on the extended-response questions.

Advice on taking the exam

During the 5 minutes reading time:

- look through the exam paper and decide if you should tackle the questions in order
- check the mark allocation for each main question and allocate the appropriate number of minutes to complete that question.

In the last few minutes at the end of the exam:

- take two or three minutes to check through your answers to each question
- check that you have not left any part-questions blank.

If you are running out of time, aim to gain as many marks as possible in the time left. Choose those part-questions that involve one or more of the following:

- less reading and information to assimilate
- a larger allocation of marks
- a topic that you have revised well.

When writing a response:

- make sure that every word can be read easily by the examiner
- refer back continually to the question to stop yourself straying
- use concise sentences, either in continuous prose or in bullet points
- do not waste time by repeating the question in your answer – go directly to the answer
- make each sentence a different mark-worthy point
- check the mark allocation – one long sentence about one point may only earn one mark, but if two or three marks have been allocated you need to think of other relevant points
- remember that the level of the command verb determines the detail in your answer

- unless you have large handwriting, there is enough room to answer on the lines provided and get full marks – extending beyond the printed lines may mean you are spending too long on your answer
- answers must be written within the boxes provided. The papers are scanned and anything outside the boxes will not be seen. If you need more space, ask for additional sheets of paper.
- state the most obvious points, briefly, if you think that you need to set the scene
- build up your response so that you answer the question fully
- always use scientific terminology
- do not write or draw outside the area which is indicated on the exam paper
- read your answer – does it match up to the actual question?
- be careful with lists. For instance, if a question requires you to name two things for two marks and you give a list of five things hoping that two are correct, you could end up with no marks. If all the five things are correct you will get the two marks but you will probably lose a mark for every member of your list that is incorrect up to a maximum of two marks. Therefore if you write down three things that are correct and two that are wrong, you may get no marks.
- be careful not to write one thing in the first part of an answer then contradict yourself later – this will cancel the mark that you scored earlier.

Skills needed to answer questions on all papers

Remember that each question can assess one or more of the skills outlined in the following table, which supports the Assessment objectives detailed in the syllabus.

Skill	Can you ...
knowledge and understanding of one or more syllabus learning outcomes	<ul style="list-style-type: none"> • recognise and remember what you have learned? • write a response that puts together what you have learned in an organised and meaningful way? • show that you know the correct scientific terms to use? • show that you know about scientific methods and techniques?
application of knowledge and understanding	<ul style="list-style-type: none"> • demonstrate all of the above? • cope with questions set in a different context?

	<ul style="list-style-type: none"> • use your current knowledge and understanding to give a reasoned response to the question? • show that you know which scientific methods and techniques can be used in a given situation?
ability to use information and transfer information from one form to another	<ul style="list-style-type: none"> • formulate research questions and make predictions? • evaluate whether a scientific method is appropriate, or has been successfully applied, in a given situation? • extract and describe information (data), both words and numbers, from diagrams, photographs, tables, graphs and charts? • identify the units on the axes? A time axis may have units of milliseconds, not seconds. • analyse data, identify and describe trends and patterns? • draw flow charts, diagrams and complete charts and tables using information provided? • identify and explain potential uncertainties and errors in data? • suggest scientific explanations for phenomena that you may not have seen before?

Types of question

Calculation questions

Read the syllabus information about the mathematical knowledge that you should have, as you can be asked to make calculations using this knowledge.

Read each question carefully.

- Always give your answers to the appropriate number of significant figures.
- Does it tell you what units to give in your answer?
- Does it ask you to use units appropriate to the answer?
- In some cases you will be asked to show a given numerical answer to a particular quantity. In that case, your calculations must show one more significant digit than the given answer.

As a general rule, you should always show your working in a calculation question. Try to make the working clear and easy to follow so that, even if you do not get the final answer correct, you could score some marks. It is often helpful to have some explanation in the working as well, again to help the examiner follow what you have done.

As a check, estimate what the answer is likely to be before using your calculator.

Make sure you have given your answer to a sensible number of significant figures based on the number of significant figures in the question.

Questions involving graphs

Know the difference between 'describe' and 'explain'.

When asked to 'describe', you might include:

- the general trend
- precise details within the overall trend
- the way in which altering the variable plotted on the x-axis affects the variable plotted on the y-axis
- extraction of values, often requiring both x and y readings
- calculations, for example rates, percentage increase or decrease.

When asked to 'explain', your answer you:

- will require knowledge and understanding
- should account for the results obtained
- may include extraction of values to support an answer.

When describing graphs that do not have a time element, avoid using terms such as 'fast', 'slow', 'faster', 'slower', 'rapidly', 'slowly', and so on.

Use a ruler to read across to or from the y-axis, and vertically to or from the x-axis, to take readings from a graph – don't rely on 'by eye' judgements.

Give the units stated on the axes when stating values from the graph in your response.

'Suggest' questions

Questions that ask you to 'suggest' a response:

- are not directly based upon the learning outcomes
- require you to apply your knowledge and understanding to answer the question

- are often easier if you have good background knowledge – you may know the answer!
- may assess your ability to think about a problem and come up with a sensible suggestion; you do not always have to come up with a ‘right’ answer to gain marks.

Making comparisons

When asked for **similarities** between two things, make it clear which features they both have in common.

When asked for **differences**, a particular approach may be required.

- Choose a feature that both things possess and give a comparative sentence, using terms such as *on the other hand* or *whereas* to link the statements about the two examples that you are comparing.
- Think of a feature possessed by one of the two but is absent in the other.
- If there are a number of differences, consider whether constructing a table will make your answer clearer.

When asked to **compare**, this may require you to give both similarities and differences.

Remember to give a full comparative answer using comparative terms and mention both items you are being asked to compare. For example ‘A is larger than B’ may get you the marks, but stating ‘A is big’ probably will not.

Drawing a diagram

In some questions, drawing a diagram is requested or hinted at, in which case there will be a blank space allocated for your use. If a diagram is not requested, you might still want to use one in your answer. Bear the following points in mind:

- A diagram is not necessary if you have given the same mark points in writing.
- A diagram may save time or make it easier to get your ideas across.
- A diagram may require labelling and/or annotating to explain what it shows.
- You may want to draw a diagram just to help you plan your written answer and save time overall.

Questions containing diagrams

Some questions contain references to diagrams; for example, ‘In Figure 1 ...’.

- These diagrams can either be essential for you to answer the question or are there as a stimulus to jog your memory and help you plan your answer.



- Spend time and make sure you understand fully what the diagram is showing you, read the question and refer again to the diagram before responding.
- If there is an instruction to refer to a particular diagram, don't ignore it – make it clear that you are using the diagram in your response.
- Carefully read the instruction to see if you need to add to the diagram; for example, you may be asked to add labels or label lines, write names of structures, or fill in blank boxes on the diagram.
- If it will help, add ideas to diagrams to prepare your answer.
- If you add labels or annotations to a printed diagram as part of your response, refer to this fact in your answer.
- You will be often asked to draw a best-fit line. Remember that this means that the line can be straight or curved.
- Never join points on a graph. Draw a smooth line through them.
- You must be able to find the gradient (slope) of a straight line and estimate its uncertainty by drawing lines of maximum and minimum gradient taking into account all error bars not just those of the first and last data points.
- You must be able to find the rate of change of a quantity by finding the gradient of the tangent line at a particular point on the graph.