

IB Physics – Internal Assessment (IA)

INTRODUCTION –GENERAL ASSESSMENT IN IB PHYSICS

Assessment is an integral part of teaching and learning. The most important aims of assessment in the Diploma Programme are that it should support curricular goals and encourage appropriate student learning. Both external and internal assessments are used in the Diploma Programme. IB examiners mark work produced for external assessment, while work produced for internal assessment is marked by teachers and externally moderated by the IB. There are two types of assessment identified by the IB:

1. **Formative assessment** informs both teaching and learning. It is concerned with providing accurate and helpful feedback to students and teachers on the kind of learning taking place and the nature of students' strengths and weaknesses in order to help develop students' understanding and capabilities. Formative assessment can also help to improve teaching quality, as it can provide information to monitor progress towards meeting the course aims and objectives.
2. **Summative assessment** gives an overview of previous learning and is concerned with measuring student achievement.

The Diploma Programme primarily focuses on summative assessment designed to record student achievement at, or towards the end of, the course of study. However, many of the assessment instruments can also be used formatively during the course of teaching and learning, and teachers are encouraged to do this.

The approach to assessment used by the IB is criterion-related, not norm-referenced. This approach to assessment judges students' work by their performance in relation to identified levels of attainment, and not in relation to the work of other students.

There are two types of assessment in IB Physics:

1. **EXTERNAL ASSESSMENT** – IB Physics Exams Papers 1, 2, and 3. The method used to assess students is the use of detailed markschemes specific to each examination paper. External assessment can be considered as *summative*.
2. **INTERNAL ASSESSMENT** – A major project which is carried out by the student, assessed by the teacher, and submitted to the IB for moderation purposes. Internal assessment can be considered both *formative and summative*.

The main difference is that: internal assessment enables students to demonstrate the application of their skills and knowledge, and to pursue their personal interests, without the time limitations and other constraints that are associated with written examinations (external assessment). It is also more hands-on and inquiry-based (and more fun! ☺) You can think of the IA essentially as a *really big* design lab.

ASSESSMENT OBJECTIVES IN IB PHYSICS

1. **Demonstrate** knowledge and understanding of:
facts, concepts and terminology; methodologies and techniques; communicating scientific information.
2. **Apply:**
facts, concepts and terminology; methodologies and techniques; communicating scientific information.
3. **Formulate, analyse and evaluate:**
hypotheses, research questions and predictions; methodologies and techniques; primary and secondary data; scientific explanations.
4. **Demonstrate appropriate research, experimental, and personal skills** necessary to carry out insightful and ethical investigations.

**ASSESSMENT
OUTLINE FOR
STANDARD LEVEL IB
PHYSICS**

**TOTAL PRACTICAL
HOURS:**

20 hours of labs
10 hours of group 4
project
10 hours of IA

= 40 hours

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	3/4
Paper 2	40	20	20	1 1/4
Paper 3	20	10	10	1
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

**ASSESSMENT
OUTLINE FOR HIGHER
LEVEL IB PHYSICS**

**TOTAL PRACTICAL
HOURS:**

40 hours of labs
10 hours of group 4
project
10 hours of IA

= 60 hours

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	1
Paper 2	36	18	18	2 1/4
Paper 3	24	12	12	1 1/4
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

Note that the internal assessment requirements at SL and at HL are the same.

THE ROLE OF THE STUDENT AND THE ROLE OF THE TEACHER

The work submitted for internal assessment must be the student’s own work. However, it is not the intention that students should decide upon a title or topic and be left to work on the internal assessment component without any further support from the teacher. The teacher plays an important role during both the planning stage and the period when the student is working on the internally assessed work. It is the responsibility of the teacher to ensure that students are familiar with the requirements of the type of work to be internally assessed and the assessment criteria—students must understand that the work submitted for assessment must address these criteria effectively. All work connected with the investigation should be done ONLY by the student. Take ownership and take pride in your own work!

Teachers and students must discuss the internally assessed work. Students should be encouraged to initiate discussions with the teacher to obtain advice and information, and students must not be penalized for seeking guidance. As part of the learning process, teachers should read and give advice to students on **one draft** of the work. The teacher should provide oral or written advice on how the work could be improved, but **not edit the draft**. ***The next version handed to the teacher must be the final version for submission.***

It is the responsibility of students to adhere to academic honesty policies, especially authenticity and intellectual property. Teachers must ensure that all student work for assessment is prepared according to the requirements both of the IB and academic honesty. All work submitted to the IB for moderation or assessment must be authenticated by the teacher, and must not include any known instances of

suspected or confirmed academic misconduct. Each student must confirm that the work is his or her authentic work and constitutes the final version of that work. **Once a student has officially submitted the final version of the work it cannot be retracted, improved, or modified in any way.**

TIMING OF THE IB PHYSICS IA

A total of approximately 10 hours of teaching time for both SL and HL will be allocated to this project. This time includes:

- ✓ time for the teacher to explain to students the requirements of the internal assessment
- ✓ class time for students to work on the internal assessment component (carry out the investigation) and ask questions
- ✓ time for consultation between the teacher and each student
- ✓ time to review and monitor progress, and to check authenticity.

At a specified date, a draft of your 6-12 page paper will be due. At a later date, I will sit down with you and give you formal feedback on the paper. I am not allowed to mark your draft but I can give you detailed comments. The next version of the paper you give me, if you choose to incorporate my suggestions, will be the FINAL version. No amendments to your paper will be allowed after that final submission.

A FEW OTHER THINGS ABOUT THE PHYSICS IA

- ✓ The IA work cannot be repeated or used for Extended Essay (EE) work.
- ✓ The IA is NOT required or expected to go beyond the syllabus in terms of topics. However, if you want to do a Physics extension beyond what we normally do, go for it!
- ✓ It MUST be between 6 and 12 pages (the student is penalized if it goes beyond 12 pages!)
- ✓ It is to be graded by your teacher but moderated by the IB. Moderation ensures that all IB Physics teachers and students around the world are producing comparable work that is assessed in a common fashion and standards according to the IBO.
- ✓ It stresses the combination of research and experimental work (a very holistic scientific approach).
- ✓ Students can do an IA based upon a lab we did in class, as an extension, but it MUST be different and clearly an extension. There MUST be a different element to it that is large enough to be suitable for an IA.
- ✓ The IA is 20% of your total IB grade at the end of grade 12. It is important!
- ✓ There is no prescribed format, but logical structure required. We will go through many examples in class.
- ✓ It is a good idea to bullet and divide entire document in a logical fashion.
- ✓ The structure of the IA should model scientific journals and their style (we will look at examples in class).
- ✓ You can use first person, third person, or whatever you want, but you should definitely write in the past tense.
- ✓ The internal assessment requirements are the same for biology, chemistry and physics.

ASSESSMENT OF THE PHYSICS IA

The IA task produced should be complex and commensurate with the level of the course. It should require a purposeful research question and the scientific rationale for it. The assessment will be rigorous.

Some possible tasks include:

- ✓ a hands-on laboratory investigation
- ✓ using a spreadsheet for analysis and modelling
- ✓ extracting data from a database and analysing it graphically
- ✓ producing a hybrid of spreadsheet/database work with a traditional hands-on investigation
- ✓ using a simulation, provided it is interactive and open-ended

Some tasks may consist of relevant and appropriate qualitative work combined with quantitative work.

The task will have the same assessment criteria for SL and HL. The five assessment criteria are: **personal engagement, exploration, analysis, evaluation and communication.**

Personal engagement	Exploration	Analysis	Evaluation	Communication	Total
2 (8%)	6 (25%)	6 (25%)	6 (25%)	4 (17%)	24 (100%)

Teachers must judge the internally assessed work at SL and at HL against the criteria using the level descriptors.

A few crucial things from the IB Physics guide:

- *For each criterion, the mark awarded should be one that most fairly reflects the balance of achievement against the criterion.*
- *When assessing a student's work, teachers should read the level descriptors for each criterion until they reach a descriptor that most appropriately describes the level of the work being assessed. If a piece of work seems to fall between two descriptors, both descriptors should be read again and the one that more appropriately describes the student's work should be chosen.*
- *Only whole numbers should be recorded; partial marks (fractions and decimals) are not acceptable.*
- *Teachers should not think in terms of a pass or fail boundary, but should concentrate on identifying the appropriate descriptor for each assessment criterion.*
- *The highest level descriptors do not imply faultless performance but should be achievable by a student. Teachers should not hesitate to use the extremes if they are appropriate descriptions of the work being assessed.*
- *A student who attains a high achievement level in relation to one criterion will not necessarily attain high achievement levels in relation to the other criteria. Similarly, a student who attains a low achievement level for one criterion will not necessarily attain low achievement levels for the other criteria. Teachers should not assume that the overall assessment of the students will produce any particular distribution of marks.*
- *It is recommended that the assessment criteria be made available to students.*

The detailed rubric will be provided to you separately.

GOOD LUCK AND HAVE FUN!

