

IB Physics Practical Lab-work

Practical work is a vital and integral part of group 4 science courses, providing students with experience of investigative and experimental activities within and outside the classroom. It enables them to develop a wide range of skills such as investigation, design, manipulative skills, data processing and analysis, evaluation, teamwork and communication. The opportunity to undertake investigations and hands-on experimentation allows them to engage in many of the processes encountered by scientists, and to appreciate the nature of scientific thought and investigation.

Teachers will develop a practical scheme of work (PSOW) for each class that will be recorded on *Form 4/PSOW*. For an SL only class or an HL only class, only one 4/PSOW is required, but for a mixed SL/HL class, separate 4/PSOW forms are required for SL and HL. This will provide a record of all practical work completed, including prescribed practicals, the group 4 project, internal assessment work and all other activities that cover the breadth of the programme, including the options. Teachers will be required to indicate on the form where the ICT skills have been used in the PSOW and also record the time allocated to the practical work done.

Included in the “Applications and skills” section of the guide is a series of practicals that students must cover either in a laboratory environment or as a simulation. The skills and general techniques associated with these common practicals may be assessed as part of the external assessment. The list of required practicals for physics is shown in the table below.

- Topic 2.1 Determining the acceleration of free-fall
- Topic 3.1 Applying the calorimetric techniques of specific heat capacity or specific latent heat
- Topic 3.2 Investigating at least one gas law
- Topic 4.2 Investigating the speed of sound
- Topic 4.4 Determining refractive index
- Topic 5.2 Investigating one or more of the factors that affect resistance
- Topic 5.3 Determining internal resistance
- Topic 7.1 Investigating half-life
- Topic 9.3 Investigating Young’s double-slit (HL only)
- Topic 11.2 Investigating a diode bridge rectification (HL only)

The table shows that each of the prescribed practicals covers an area of investigative work that can be approached in a variety of ways, depending on individual circumstances and needs. For example, in topic 7.1, investigating half-life can be carried out as a hands-on practical or as a simulation or using coins, dice or sweets (candies), depending on resources available and national regulations regarding the use of radioactive substances in schools. The core material can be assessed by finding the half-life from the decay curve, but HL students should be able to use semi-log graphs to determine the decay constant λ and then the half-life of the substance investigated.

Additional practical work

The entire practical programme of work will take a minimum of 40 hours for SL courses and 60 hours for HL. Included in this time allocation are 10 hours for the group 4 project and 10 hours for the completion of the internal assessment task as well as the prescribed practicals and other practical activities.

As part of an inquiry-based learning programme, teachers will be able to incorporate other practical tasks that enhance learning into their teaching. These might include simulations, computer-based modelling and investigations, as well as more traditional types of activities such as demonstrations.