

**An Roinn Oideachais agus Scileanna**

**Department of Education and Skills**

**Subject Inspection of Physics  
REPORT**

**St Kilian's Deutsche Schule,  
Roebuck Road, Clonskeagh, Dublin 14  
Roll number: 60630W**

**Date of inspection: 6 October 2010**



**A N R O I N N | D E P A R T M E N T O F  
O I D E A C H A I S | E D U C A T I O N  
A G U S S C I L E A N N A | A N D S K I L L S**

**REPORT**  
**ON**  
**THE QUALITY OF LEARNING AND TEACHING IN PHYSICS**

---

**SUBJECT INSPECTION REPORT**

This report has been written following a subject inspection in St Kilian's Deutsche Schule, Dublin. It presents the findings of an evaluation of the quality of teaching and learning in Physics and makes recommendations for the further development of the teaching of this subject in the school. The evaluation was conducted over one day during which the inspector visited classrooms and observed teaching and learning. The inspector interacted with students and teachers, examined students' work, and had discussions with the teachers. The inspector reviewed school planning documentation and teachers' written preparation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal and subject teacher. The board of management was given an opportunity to comment in writing on the findings and recommendations of the report; a response was not received from the board.

**SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT**

Science is a core subject at St Kilian's Deutsche Schule. Class groups are of mixed ability for junior Science and senior Physics. At senior cycle, Physics, Chemistry and Biology are offered to students as part of the Leaving Certificate programme. The uptake of Physics is very good and has shown an increase in the current school year. Very few girls have chosen the subject in the current year, however, and senior management, together with the physics teacher, is urged to explore the possibilities of improving the gender balance for Physics uptake in the school. Time allocation to Science at junior cycle and to Physics at senior cycle is in accordance with syllabus recommendations. The distribution of physics lessons across the week is good.

Students are well supported in making an appropriate choice of science subjects at senior cycle. Parents are informed regarding subject choice through a parents' information evening. Subjects are sampled in TY and Physics, Chemistry and Biology are offered as half-yearly modules to TY students. The content of these modules is appropriate to the TY programme. The science specialists, guidance counselling service and senior management all play an active part in ensuring that students make an informed choice. Subject bands are created in such a way that students can study up to three senior cycle science subjects. This is very good practice.

There are three science laboratories in the school. A well equipped resource room with computers, books and videos adjoins the physics laboratory. This is a valuable addition to science facilities in the school. The laboratories are very well maintained. Access to laboratories is very good for practical lessons. School management provides the science department with an annual budget. Information and communications technology (ICT) provision in the laboratories is very good with computers, data-projectors, interactive whiteboard and internet access. These resources are well utilised in the delivery of science education in the school.

School management supports teachers' pursuit of continuous professional development (CPD) and science teachers are facilitated to attend in-service courses. School management also supports the school's affiliation to the Institute of Physics.

The school has a current health and safety statement. Health and safety equipment was present in the laboratories at the time of the evaluation. Very good classroom practice in this regard is commended. Laboratory safety rules were clearly on display in the science laboratories. Nevertheless, constant vigilance is required to ensure that school bags are stored safely while students are working in the laboratories.

Differentiated teaching is integrated well to facilitate students with additional learning needs. There is a focus on using a variety of appropriate resources. Students with English language needs are supported in many ways. These include the production of a special support booklet by the science and language departments and additional lessons may also be offered on science vocabulary. This is very good practice. Since the merging of St Kilian's Deutsche Schule with the Lyceé Francais d'Irlande (LFI) into a Eurocampus, the Junior Certificate year plans have been amended to accommodate the LFI curriculum, which serves to ease the transition back to France for some students.

Students have participated in many extra-curricular and out-of-school activities including the BT Young Scientist and Technology Exhibition, Science Week activities and SciFest. TY students are encouraged and supported to enter projects in national competitions having completed them as part of their coursework. This is very good practice.

#### **PLANNING AND PREPARATION**

Science is co-ordinated effectively in the school with very good delegation of duties. This position is currently assigned by school management to an individual teacher whose role includes the organisation of subject meetings, updating the science plan, submission of minutes to management and arranging for the ordering of materials. Consideration should be given to the creation of a voluntary rotating position for the co-ordination of Science. In this way, many teachers can gain experience at leading co-ordination and planning at subject department level.

Minuted meetings take place at least once per month and minutes of science department meetings show that discussions take place on many issues including planning, student language skills, equipment, practical work and extra curricular activities. The work of the science teachers in this regard is commended.

A very good and collaborative subject plan is in place for Science with an additional plan for Physics. Areas addressed in the plans include time allocation, grouping of students, access to the subject, planning for students with special needs, health and safety priorities and assessment objectives. The production of a revision booklet for physics students is highly commended, as it provides a valuable reference resource for students. In addition, the physics plan addresses some future developmental priorities for the science department. This well-thought-out section of the plan includes many valuable proposals including the development of the school website to support Science, plans to increase the effective use of ICT in the classroom, plans to monitor the uptake of senior science subjects and a proposal on updating teaching skills. This approach to planning is highly commended. It is recommended that future planning priorities should include the sharing of ICT resources across the school's computer network, a review of TY planning in line with Department guidelines and the linking of each physics topic in the scheme of work to assessment strategies, methodologies and resources. It is also important that review and evaluation become an integral part of this plan.

Individual planning was very good. Practical equipment, ICT and teaching resources were ready in advance of lessons observed. The content and delivery of lessons were very well planned as evidenced in the course of the evaluation.

## **TEACHING AND LEARNING**

As a result of the very good planning, lessons observed were very well structured and paced. Learning objectives were shared in some lessons and this practice should be extended to other lessons. There was a very good atmosphere of learning created in all lessons with positive student-teacher and student-student rapport. Students were affirmed in their work and in their responses to questions and this contributed to very successful learning outcomes. Students were motivated to learn and showed a keen interest in the theme of each lesson. Questioning, when used as a teaching strategy, was probing and sufficiently challenging. Students were confident at answering questions on their work and many demonstrated good problem-solving skills during the course of the evaluation.

Methodologies observed in the course of the evaluation were varied and this enhanced student learning. The board was used to collate material from students and to highlight key words, concepts or fundamental mathematical formulas and equations. Demonstrations were effectively employed to reinforce abstract concepts. During a lesson on the theme of static electricity, various methodologies contributed to effective student learning. A short video stimulated initial interest in the theme of the lesson. Students were active in discovering and exploring the build-up of charges on a balloon. Focused questioning of students ensured that the pace of the lesson was appropriate and the use of well designed slides focused students' attention on the topic. A well-planned demonstration using the Van de Graff generator, followed by an appropriate animation, consolidated the theme of the lesson. To further consolidate learning, it is recommended that a focused worksheet on the theme of the lesson be given to students as an assignment.

Student practical work formed the core part of some lessons. During one lesson visited, students were assigned the task of measuring the focal length of a converging lens. They were encouraged to take an approximate measurement followed by a series of accurate measurements. Group work was well organised and was effective. Students' observation and measurement skills were developed throughout. Students' confidence was reinforced by teacher affirmation of their ability to answer examination questions correctly on this theme. Critical analysis skills were developed through the investigative process and there was very good emphasis on precautions, experimental error and units. It is suggested that more suitable seating arrangements be used during the introduction to practical activities. In addition, some students require further support with their graph-drawing skills and this should form part of future planning. It is also suggested that a discussion on possible errors and precaution in advance of the practical activity be introduced.

Practical demonstrations were used very effectively in all lessons visited. For example, in one lesson, the electroscope was well utilised to show the properties of charges. This demonstration was effectively used to consolidate learning and students were asked to predict the outcomes in advance. This methodology was very successful in achieving successful learning outcomes. It is suggested that it be used with an overhead projector to ease full class observation of the demonstration.

The uptake of higher-level Physics by students is very good, with a very large proportion of students achieving a higher level grade and with improving trends in recent years.

## **ASSESSMENT**

There is ongoing continuous assessment. Students sit four German style 'Klassenarbeiten' examinations per year and the overall average grade is calculated. Third-year and sixth-year classes sit 'mock' examinations in February. Formal examinations take place at Christmas and summer for other class groups. TY students are continually assessed through their ongoing project and practical work. Parents are made aware of students' progress in many ways, including the annual parent-teacher meeting and the student journal. An October mid-term report is sent home containing grades and comments. In addition, two further school reports are sent to parents at Christmas and summer. Certificate examination results are analysed by subject teachers and are well utilised in planning for the future.

Homework procedures are outlined in the science and physics plans and homework was assigned at the conclusion of all lessons observed. These assignments consolidated the classroom learning experience. Records of students' practical work were maintained to a good overall standard. Further monitoring is necessary to ensure that suggestions for improvement are taken on board by individual students. This formative assessment strategy should further improve student outcomes.

## **SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- Science is a core subject and science subjects at senior cycle are well catered for with Physics, Chemistry and Biology offered to students.
- The uptake of Physics is very good and has increased over recent years.
- A very good and comprehensive subject plan is in place for Physics and Science.
- There was a very good atmosphere of learning created in all lessons with positive student-teacher and student-student rapport.
- Students were affirmed in their work and in their responses to questions and were motivated to learn.
- Lessons were very well planned and structured.
- Methodologies observed in the course of the evaluation were varied. The use of ICT, the board and demonstrations were effectively employed to reinforce abstract concepts.
- Assessment practices are very good.
- The uptake of higher-level Physics by students is very good, with a very large proportion of students achieving a higher-level grade.

As a means of building on these strengths and to address areas for development, the following key recommendations are made:

- The school should proceed to develop improved chemical storage facilities in line with best practice and Department guidelines.
- Future science planning should include target setting for the development of Science over coming years.
- The schemes of work for Physics should be developed to link each topic to its appropriate assessment strategy, methodologies and resources utilised.
- The TY plan for the science subjects should be written and developed using Department guidelines.

Post-evaluation meetings were held with the teacher of Physics, together with the principal at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

*Published April 2011*