

**An Roinn Oideachais agus Scileanna**

**Department of Education and Skills**

**Subject Inspection of Science and Biology  
REPORT**

**Cross and Passion College  
Kilcullen, Co. Kildare**

**Roll number: 61690W**

**Date of inspection: 28 April 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 SCIENCE AND BIOLOGY**

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**SUBJECT INSPECTION REPORT**

This report has been written following a subject inspection in Cross and Passion College, Kilcullen. It presents the findings of an evaluation of the quality of teaching and learning in Science and Biology and makes recommendations for the further development of the teaching of these subjects in the school. The evaluation was conducted over two days during which the inspector visited classrooms and observed teaching and learning. The inspector interacted with students and examined students' work. The inspector reviewed school planning documentation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the deputy principal. The board of management of the school was given an opportunity to comment in writing on the findings and recommendations of the report, and the response of the board will be found in the appendix of this report.

**SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT**

There is very good provision and whole-school support for the study of Science and Biology in Cross and Passion College. Science is a core subject for all junior cycle students. Science is also well provided for in the compulsory Transition Year (TY) and Biology, Chemistry and Physics are all offered as optional subjects for students following the Leaving Certificate programme.

The allocation of time to Science and Biology classes is very good. Junior cycle classes are allocated one double and two single periods for Science each week. Students are given an open choice of subjects when entering fifth year and are well supported in making their choices. The number choosing Biology is very encouraging. Biology classes are allocated one double and three single periods each week. Time allocations are within syllabus guidelines. All science and biology classes are mixed ability and class periods are well distributed across the week.

The sciences are well provided for in TY. Students all follow three ten-week modules in Chemistry, Physics and Crime Scene Investigation (CSI) respectively, for which they are allocated a double period each week. In addition, those who choose to follow the year-long biology module receive an additional double period each week.

Facilities for the teaching of science are very good and include three laboratories, designated Biology, Chemistry and Physics and a tiered demonstration room. The laboratories and associated preparation and storage areas are well organised and maintained to a good standard. It is recommended that the storage of chemicals, using a colour-coded method, be updated to ensure that all chemicals currently on site are appropriately classified and stored. Information and communications technology (ICT) resources are very good and each laboratory has a ceiling-mounted data projector. The learning environment in the laboratories and demonstration room is enhanced by a display of appropriate charts and posters, including some student-prepared material. Student access to these facilities is very good and all class groups have weekly access for a double period at a minimum.

As all science-teaching facilities are located in the same section of the school buildings, it is recommended that the corridors of this area are used to publicise and promote the sciences. Student project work could be displayed along with notices of upcoming events in the sciences, courses and careers information, topical articles from newspapers and magazines and photographs of relevant student activities and outings.

The science teachers are all qualified and appropriately deployed. Teachers remain with the same class groups from first to third year and from fifth to sixth year. This ensures continuity in both teaching and learning and facilitates long-term planning. There are currently five qualified teachers of Science and Biology in the school. It was evident from the outset of the inspection that biology teachers are keen to promote positive attitudes towards their subject and to encourage students to achieve to the best of their abilities. Teachers' attendance at relevant continuing professional development (CPD) courses is supported by school management and, in addition, whole-school professional development, in the recent past, has focussed on the topic of differentiated learning.

Teachers and management support the provision of a range of extracurricular and co-curricular activities including inviting guest speakers to address students on science-related topics, science quizzes, field trips and visits to out-of-school sites, and involvement in the Young Scientist exhibition.

Good attention to health and safety issues was observed during the inspection. Safety equipment available in the laboratories included first aid kits, fire extinguishers and fire blankets. It is recommended that, in order to enhance health and safety provision, simplified safety notices be displayed in a prominent manner in the laboratories. The school has a health and safety statement which was drawn up with appropriate consultation. It is recommended that this statement be reviewed annually, in keeping with best practice.

## **PLANNING AND PREPARATION**

Subject department planning is well established and an active teaching team manages the day-to-day issues and planning functions of the department. A good level of collegiality was in evidence amongst the members of the department. One of the science teachers, on a rotating basis, leads and co-ordinates the work of the department. The responsibilities of the co-ordinator include setting budgets, chairing meetings and liaising with school management. Formal meetings are held regularly and the minutes of these are recorded and shared with school management. Frequent informal and casual meetings also occur to deal with housekeeping arrangements and ongoing issues.

The science department folders show evidence of detailed ongoing planning work for the variety of subjects and courses taught by the members of the science department. The plans have not been written to an overall common template and all have significant strengths and some weaknesses. The Junior Certificate science plan lists the topics to be taught each year, in terms of the learning outcomes described in the syllabus document. It is recommended that the schedule be tightened to cover each term of the three-year course. This will facilitate more frequent common assessment of students and will improve continuity. Commendably, the Leaving Certificate biology plan contains a schedule for content delivery on a monthly basis and includes a schedule of all mandatory student activities, thus facilitating the provision of necessary resources. It is recommended that both documents be enhanced by the inclusion of references to teaching and learning methodologies, in particular those that are most useful in mixed-ability classes where

strategies to support differentiated teaching and learning are most important. In addition, it is recommended that more detailed consideration be given to assessment, in order that assessment methods and criteria are more closely linked to stated learning outcomes. The plans for the three ten-week TY modules in Chemistry, Physics and Crime Scene Investigation (CSI), and for the full-year biology module, demonstrate a commitment to the provision of alternative, activity-centred courses, in keeping with the ethos of TY.

It is recommended that the contents of the science department folder be copied onto the school's ICT network, to facilitate the sharing of the resources it contains, to enable ongoing modification and updating of materials and to promote the dissemination of good practice.

Individual teacher lesson planning was mostly very good and lesson plans were presented to the inspector in a number of instances. The teachers were well prepared for class and, in almost all cases, due cognisance was given to the needs and abilities of students in preparing and delivering lessons. Such preparation resulted in good quality lessons. Required resources were prepared in advance, including electronic resources, and the apparatus required for demonstration and student-centred investigative work.

#### **TEACHING AND LEARNING**

In the majority of the lessons observed, good quality teaching and learning was observed with some very good practice in evidence in some instances. Teachers worked hard to create good learning environments and to provide quality learning opportunities for students. The best lessons were those where established routines were in place and teachers had high expectations of students.

The quality of rapport between teachers and students was very good. Students were challenged by their teachers and they responded well. In some of the lessons observed, it was noted that students maintained good notebooks in which they recorded important points of theory during the course of lessons. This is good practice and these notebooks serve as valuable revision aids to students. The level of individual attention given to students facilitated a differentiated approach to teaching. This was evidenced by the manner in which, in most instances, teachers moved around the classrooms assessing students' learning and understanding, assisting and supporting them where necessary, and encouraging them to perform to the best of their abilities.

Lesson structure was good in most instances. Best practice was observed in those lessons where lesson objectives, in the form of learning outcomes, were outlined to students at the start of the lesson and where these objectives were revisited at the close of the lesson, in order to review progress, consolidate learning and provide a basis for the assignment of homework. It is recommended that teachers consistently apply this practice of sharing and reviewing lesson objectives. The balance between teacher-led and student-centred phases in lessons was mostly good. However, in a small number of instances, a tendency towards prolonged periods of teacher input should be avoided. In these situations, more frequent pauses for review and consolidation of learning should be introduced, and active student participation should be planned for.

The topics addressed during the lessons included energy, plant physiology, reflection of light, ecology, microbiology, photosynthesis atomic structure. A variety of appropriate and well-chosen methodologies and active teaching strategies were put into practice to encourage student participation and facilitate learning. These included the use of ICT, teacher explanations, demonstrations, discussion, student writing, the use of worksheets and handouts, and questioning

of students. The use of subject-specific terminology was generally good. Good continuity with prior learning was always apparent and content was well linked to students' experiences. Lessons were appropriately paced.

Questioning of students was used extensively and effectively in most instances and students generally responded knowledgably and with confidence. The use of questions to establish levels of prior knowledge, to assess the quality of learning on an ongoing basis and to assist in the exposition of new material was evident. Questions ranged from simple, lower-order, recall-type questions to more difficult higher-order questions which encouraged students to think at a deeper level. A good mix of global and directed questioning techniques was used. When using directed questioning, it is important that students are given time to think and compose their answers before a respondent is chosen. In addition, care should be taken to ensure that all students are included.

Good use was made of ICT in a number of lessons to illustrate and explain the content. In one particular lesson observed, a PowerPoint presentation was expertly combined with questioning of students and the use of discussion to generate a stimulating and interesting lesson which was designed to address a variety of learning styles. The level and quality of interaction between teacher and students was excellent, with students being encouraged to think at a high level and to ask questions. This approach provided the teacher with opportunities to apply a differentiated approach and to provide for the individual needs of all students. Students responded with enthusiasm and worked very hard to meet the high expectations that had been set for them. Such excellent integration of methodologies, which engaged students and encouraged them to perform at a very high level, should be shared amongst the members of the science department.

Student practical activity, which was well managed and was carried out efficiently and safely, was a feature of some of the lessons observed. These activities provided opportunities for student-centred learning, particularly with regard to the development of practical skills. Students were confident and able to complete the tasks involved in a competent manner. It is commendable that, in most instances, an investigative approach was taken to this work. Best practice was seen where whole-class teaching, prior to the practical work, was used to ensure that students were familiar with the tasks to be performed and where students were given an opportunity to review their work and rationalise their findings, in a similar whole-class setting, following the practical activity. It is recommended that, in order to encourage an investigative approach to practical work, students be encouraged to complete their practical reports only when the relevant activities have been completed.

Homework was given at the conclusion of most lessons. The homework was appropriate to the lesson content in all instances and was designed to assist students in learning and understanding the topic in question.

## **ASSESSMENT**

Good quality learning was evident, in most instances, from level and quality of students' interactions with their teachers, the questions they asked and the quality of their answers during in-class questioning, their overall level of engagement and the quality of their written work. Students successfully carried out the different tasks assigned to them during the lessons observed and they displayed a good level of knowledge and understanding during interaction with the inspector.

Teachers used questioning, examination of homework and general observation of students, to assess students' performance on an ongoing basis. Teachers were affirming of students' efforts during class. The quality of students' laboratory notebooks was very good in some cases. However, overall, the quality was uneven and the level of monitoring was not consistent. It is important that students' written work is affirmed and that their copybooks and laboratory notebooks are regularly monitored and feedback provided in order to encourage improvement. It is recommended that teachers agree common standards for students' written work and implement a common approach to monitoring and correcting this work and to providing quality feedback to students.

A good system of formal assessment is in place in Cross and Passion College. Students in first, second and fifth year are assessed at Christmas and, using common examinations, at the end of the school year. Reports are issued following these assessments. Certificate examination classes are assessed at Halloween and by means of mock examinations in February. Reports are issued on both occasions. Additional testing is at the discretion of individual teachers. Contact with parents is maintained through annual parent-teacher meetings, held after the Halloween examinations for the certificate examination classes, and through use of the students' journals.

Outcomes in the certificate examinations are generally good. However, it is recommended that an annual analysis of results, coupled with ongoing planning for improvement, be carried out. This will help to ensure that students are appropriately challenged and that they are given the best possible advice in choosing the level at which they wish to sit their examinations.

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

The following are the main strengths identified in the evaluation:

- There is good provision and whole-school support for the study of Science and Biology in Cross and Passion College. The facilities available for the teaching of science are good and the provision of ICT resources is very good.
- The learning environment in the laboratories and demonstration room has been enhanced by a display of appropriate charts and posters, including some student-prepared material.
- Subject department planning is well established and an active teaching team manages the day-to-day issues and planning functions of the department.
- The science department folders show evidence of detailed ongoing planning work for the variety of subjects and courses taught by the members of the science department.
- In the majority of the lessons observed, good quality teaching and learning was noted with some very good practice in evidence in some instances. Lessons were well structured, classroom management was good and there was a good rapport between students and teachers.
- Some excellent use of ICT in combination with other methodologies was observed.
- Students were challenged by their teachers and they responded well. They engaged well in the learning process.
- A good regime of formal and informal assessing and monitoring of students' progress and achievement is in place and parents are kept informed of students' progress on a regular basis.

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

- It is recommended that the storage of chemicals, using a colour-coded method, be updated to ensure that all chemicals currently on site are appropriately classified and stored.
- It is recommended that the corridors of the science area of the school be used to publicise and promote the sciences.
- It is recommended that simplified safety notices be displayed in a prominent manner in the laboratories and that the health and safety statement be reviewed annually.
- It is recommended that the schedule in the Junior Certificate science plan be tightened to cover each term of the three-year course, that planning documents be enhanced by the inclusion of references to teaching and learning methodologies and assessment, and that the contents of the science department folder be copied onto the school's ICT network.
- It is recommended that an occasional tendency towards prolonged periods of teacher input in lessons should be avoided and that active student participation should be planned for.
- It is recommended that teachers agree common standards for students' written work and implement a common approach to monitoring and correcting this work and to providing quality feedback to students.

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

# **Appendix**

**SCHOOL RESPONSE TO THE REPORT**

**Submitted by the Board of Management**

**Area 1 Observations on the content of the inspection report**

We wish to thank you for the report with which we are very pleased and we concur with your recommendations.

**Area 2 Follow-up actions planned or undertaken since the completion of the inspection activity to implement the findings and recommendations of the inspection.**

Steps on the first three recommendations are already being taken and follow up on the other three are in the planning stage.