

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Science and Biology
REPORT**

**Loreto Secondary School
Balbriggan, County Dublin
Roll number: 60010P**

Date of inspection: 22 April 2010



**AN ROINN | DEPARTMENT OF
OIDEACHAIS | EDUCATION
AGUS SCILEANNA | AND SKILLS**

REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND BIOLOGY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Loreto Secondary School, Balbriggan. 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 teachers 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 principal. The board of management of the school was given an opportunity to comment on the findings and recommendations of the report; the board chose to accept the report without response.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

Loreto Secondary School, Balbriggan has a current enrolment of 1185 girls. Science is offered as an optional subject on the school's junior cycle curriculum. The number of students choosing the subject at this level is very high. In the senior cycle, Science forms part of the compulsory Transition Year programme (TY). Students have the option of choosing Biology, Chemistry and Physics for the Leaving Certificate. It is good that Biology is offered on every option line in senior cycle. The number of students choosing Biology for the Leaving Certificate is high.

The spread of timetabled class periods throughout the week for Science and Biology is good. Junior cycle classes are of mixed ability. Timetabled provision for Science and Biology is satisfactory. The class periods for these subjects are also well spread across the weekly timetable

Teachers are deployed in line with their qualifications and while continuity of teachers had been an issue in junior cycle Science in the past, it is good that this has been rectified in recent years. However, there is still one class group which is shared between two teachers and management should avoid this in future timetabling if at all possible.

Teachers' continuing professional development (CPD) is well supported by school management. In addition to whole-school in-service courses, science teachers have participated in a range of science related in-service courses. This is evidence of the science department's commitment to the development of the subject within the school.

There are five laboratories in the school. They are clean, bright and well maintained. Teachers have gone to considerable lengths to ensure the laboratories are stimulating learning environments with the provision of displays of student-generated work, commercial posters, newspaper clippings and plants. All laboratories have appropriate health and safety equipment including shut-off points for gas and electricity, first aid kits, fire extinguishers and fire blankets. Appropriate accident-reporting procedures are in place. A code of conduct for the laboratories

was displayed in each laboratory and this code is also given to parents to read and sign. Due to the high uptake of Science among students, access to the laboratories for some classes can be an issue. This is generally negotiated among the science team at the start of the year. The school has made application to the Department of Education and Skills for an extension to the school building. These plans include provision for another laboratory which should help improve laboratory access.

The laboratories have adjacent preparation areas and chemical stores. Since May 2006, the school has adopted the second level support service (SLSS) guidelines on the storage of chemicals. Appropriate cupboards for corrosives, flammables and toxics are in place. However, each chemical store should contain an extractor fan.

The science department has good access to information and communications technology (ICT) and has benefited from the participation of the school in a pilot scheme run by the Department of Energy and Communication. As a result of the scheme, a number of laboratories have been fitted with ceiling mounted data projectors. Currently, some laboratories have desktop computers and in a number of cases, the teachers use their own personal laptops. As part of the pilot scheme, further desktop computers and 100mb broadband will be allocated to the school in the near future. In addition to ICT equipment there is a wide range of resources and materials available for teaching and learning the sciences.

PLANNING AND PREPARATION

School management facilitates and supports the planning process through the provision of time for meetings of the science department. These meetings take place three times per year. In keeping with good practice, the minutes of these meetings should be kept within the science planning documentation. Science teachers also meet frequently on an informal basis to engage in professional discussion. Currently there is no co-ordinator of Science. Consideration should be given to appointing a co-ordinator of the science department and rotating the position amongst all members of the team. This would promote leadership and encourage each team member to take responsibility for the running of the science department on a yearly or two-yearly basis.

It was evident from the review of planning documentation that the science department has engaged with the subject planning process and progress has been made on drawing up plans for Science and Biology. Each plan opens with the aims and objectives of the subject department which focus on encouraging students to gain confidence in the subject and to develop an appreciation for Science and Biology. Plans are based on the school development planning initiative (SDPI) guidelines.

Both the biology and science plans contain programmes of work for each year group and level. These are syllabus-based and outline the learning outcomes for each unit of work. This is in keeping with very good planning practice. In order to build on this good work, consideration should be given to the inclusion of methodologies, an appropriate time frame and modes of assessment for each unit of work. Over time, this could facilitate a very worthwhile sharing of experience and expertise. In further developing the subject plan the science department should ensure that it accurately reflects the valuable approaches and methodologies that characterise the day-to-day work of the science teachers.

Planning documentation was also made available for TY Biology. The plan lists the topics to be completed. However, there is scope to expand each topic on the list to include the real life

materials, apparatus and active methodologies used in lessons. TY students complete two written assessments and a project. The plans should also reflect how these tasks are to be assessed. It is recommended that the TY plan for the sciences be reviewed using part two of the document *Writing the Transition Year Programme* for advice.

TEACHING AND LEARNING

A high standard of teaching and learning was evident in all of the eight lessons observed during the evaluation. All of the lessons had a clear focus, were well structured and progressed at a pace that was appropriate to the ability level of the students. In general, a good balance between teacher input and student activity was achieved as teachers were careful to vary the learning activity regularly throughout lessons. This is very good practice.

Teachers provided a comprehensive oral introduction to lessons. Some teachers wrote the learning objectives of the lesson on the board at the start and checked that they had been achieved at the end of lessons. These good practices ensure that students know what to expect from each lesson.

Classroom management was good and all learning activities were well managed. Students engaged well with the learning activities and showed enjoyment in the subject. Methodologies were appropriate to the students' abilities, needs and interests.

In all the lessons observed explanations and instructions were clear and accurate. Good use was made of the white board to clarify and reinforce the main points of the lesson. Great efforts were also made to present knowledge in a style that related to students' everyday lives and this proved very effective in stimulating interest and encouraging learners to engage with the lesson. There was some emphasis on reinforcing key terminology for the topics being taught. This practice helps students develop the necessary linguistic skills in preparation for the written examinations.

Teachers made very good use of questioning to assess learning and to engage and involve all students. In most cases, higher-order questions were used to help students explore ideas and concepts. In general, teachers provided opportunities for students to develop creativity in the application of learning. This was achieved by the use of open questioning strategies and allowing students plenty of time to formulate ideas, by discussing new and unfamiliar tasks. Students were asked to work in pairs to provide assistance for each other.

A number of teachers had prepared handouts or worksheets to complement the text book; in all cases these were well designed to support learning. It was clear that a very high level of care is provided for students who experience difficulty with the subjects.

Inspector interaction with students indicated that they generally had a good understanding of the topics being studied. In the practical lessons observed, they were competent in the handling of equipment and materials. Appropriate health and safety regulations were adhered to during the course of the practical work observed and students displayed good routines in setting up and clearing away apparatus. The development of such routines is good preparation for practical activities and aids in successful lesson time management. It is good that students were encouraged to write up their results in their own words at the end of a practical activity and good practice was observed where the teacher encouraged discussion of results, the suitability of the methodology and the process of fair testing.

The physical environment of the science laboratories is enhanced by a display of educational posters, plants and models. Interesting displays of students' work serves to promote a sense of ownership and responsibility for the creation of a stimulating learning environment.

The relationship between students and their teachers was observed to be very good. Students responded very well to the encouragement and affirmation that they received from their teachers. A caring learning environment existed in all of the classrooms visited. Every effort was made to ensure that students' experience of Science was positive and that they could develop confidence in the subject. Students contributed fully and freely to lessons and it was evident that they were enjoying the subject.

ASSESSMENT

All year groups, with the exception of TY are formally assessed at Christmas. Common examinations are held in May for first year, second year and fifth-year students. Students' progress is closely monitored by teacher observation and oral questioning in class. Tests are set at the end of each topic. Students preparing for the certificate examinations sit mock examinations in spring. Reports are sent home at Christmas and in May, while sixth-year students receive a report after their mock examination. Parent-teacher meetings are held annually.

The school has a homework policy. Homework is set regularly and is corrected as part of the following lesson. Students are provided with formative comments on their homework. It was evident from the review of students' copybooks that the standard of presentation of work is high in most instances. The majority of teachers routinely monitor students' work and this contributes to these high standards. Routine monitoring of copybooks and notebooks should be carried out by all members of the science team. Most teachers provide students with valuable feedback by including comments in the correction of tests and homework. It is recommended that the science team develop common correcting practices and put in place some procedure to encourage students to follow up on corrections and comments made in all notebooks. Good practices should be discussed at the next planning meeting with a view to developing an agreed assessment policy for Science.

Management carries out an analysis of students' performance in the certificate examinations compared to the national norms. This should be used by the science team to discuss students' achievements and influence future planning.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- There are five laboratories in the school which are clean, bright and well maintained.
- The science department has good access to information and communications technology.
- School management facilitates and supports the planning process through the provision of time for meetings of the science department.
- A high standard of teaching and learning was evident in all of the eight lessons observed during the evaluation.
- Students engaged well with the learning activities and showed enjoyment in the subject.

- Teachers made very good use of questioning to assess learning and to engage and involve students.
- Homework is set regularly and is corrected as part of the following lesson.
- The physical environment of the science laboratories is enhanced by a display of educational posters, plants, models and students' work.

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

- The TY plan for the sciences should be reviewed using part two of the document *Writing the Transition Year Programme* for advice.
- The science team should develop common correcting practices for homework and put in place some procedure to encourage students to follow up on corrections and comments made in all notebooks.
- The science team should use the analysis of students' performance in the certificate examinations to discuss achievement and influence future planning.

A post-evaluation meeting was held with the principal and deputy principal, at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.