Subject Inspection of Biology
REPORT

Salesian Secondary School
Fernbank, North Circular Road, Limerick
Roll number: 64280S

Date of inspection: 7 December 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN BIOLOGY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Salesian Secondary School. It presents the findings of an evaluation of the quality of teaching and learning in Biology, 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 the teachers, examined students’ work, and had discussions with the teachers. The inspector reviewed school planning documentation and the written preparation by the teacher. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal and subject teachers. 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

Science is an optional subject for Junior Certificate students in the school with classes arranged on a mixed ability basis. All students can choose to study Science with currently between half and two-thirds of the junior cycle cohort opting for this subject. The subject has a weekly time allocation of three single lessons and one double lesson in each year of junior cycle, which is very generous and exceeds the recommended time allocation in the syllabus document.

The Transition Year (TY) programme which follows Junior Certificate is also optional in the school. Approximately fifty percent of the students decide to opt for the TY programme. Biology is studied as part of the programme for half of the year. Three single lessons are allocated to the subject. The introduction of a double lesson to facilitate practical work should be considered in future timetabling for this subject.

In addition to Biology, Chemistry and Physics are offered as part of the established Leaving Certificate programme. The weekly time allocation of one double lesson and three single lessons are within curriculum guidelines. Option subject blocks are created based on student preferences. Biology is a popular science subject for Leaving Certificate with approximately half of all Leaving Certificate students studying it in the school, currently in a mixed setting.

The science facilities comprise two laboratories, with one preparation area and a separate storage area attached to each of the laboratories. The science department also has use of another classroom, room seventeen on the same corridor as the laboratories, which is used as a further science space. The laboratories are well maintained and this work is aided by the presence of a laboratory technician in the school. Recent years has seen some refurbishment of the laboratories. Further consideration should be given to the storage of materials in the laboratory and to how accessible equipment and materials are to students for use in practical work. In addition the storage of some materials in project boxes which can be transported easily to room seventeen ensures the usability of this room as an additional science area by
A four-member science-teaching team is involved in the delivery of the science programmes currently in the school, with two teachers involved in teaching Leaving Certificate Biology. No formal subject co-ordinator is appointed from this team. However, a collaborative arrangement exists between all the science staff and the laboratory technician. The team should consider the merits of appointing a subject co-ordinator and rotating this role amongst its members regularly. This would contribute to the professional development of all members of the team over time. Currently one formal meeting occurs annually with regular informal meetings. Additional formal meeting time should be considered with the recording of minutes a priority. A budget is assigned for the maintenance and enhancement of resources in the sciences. Decisions regarding purchases follow consultation between the science team and the laboratory technician.

Some visual materials were displayed in the laboratory and on notice boards on the corridor outside the laboratories. Display of work which is of student origin is to be encouraged. It is important to ensure that displayed materials reflect work being completed in class which will aid and enhance the students’ learning.

A data projector, laptop computer and printer are some of the permanent resources within the laboratory and this is positive. Continued use and development of such resources is recommended.

The school has a health and safety statement. Management stated that teachers were consulted in the preparation of this statement, which is good practice. The statement is reviewed as the need arises, with the last review occurring more than one year ago. There is a good level of safety equipment in the laboratories including fire extinguishers, safety blankets, safety glasses and laboratory coats.

Opportunities for continuing professional development (CPD) in Biology have been availed of and encouraged by management. Membership of professional organisations is encouraged and supported by the school. This is very positive.

**Planning and Preparation**

Planning documents outlining the course plan for all senior biology classes were viewed. The team has also included material in relation to cross-curricular planning, homework and assessment as part of the plan, which is valuable. Planning should now focus on the areas of teaching methodologies in Biology, further development and integration of keywords by topic, practical work and skills, the provision of differentiation and the inclusion of learning outcomes.

The use of information and communication technology (ICT) is acknowledged and further development of this area is to be encouraged. It is suggested that ICT be used to store material developed by the science team which can be accessed by the teachers for use in their lessons.

A TY Biology course plan with associated practical activities has also been developed. Field trips are also a component of TY, which sees students visit “Seed savers” in Scariff and a community farm in Cloughjordan. These trips are linked to modules of work completed by...
the students as part of their studies with all students studying this module. Strategies to help students who may not have completed junior Science and would like to study Biology for their Leaving Certificate are contained in the plan. This is good for the skill development of these students. Further development of the planning documents could see the inclusion of the desired learning outcomes for the students.

The lessons were structured to provide continuity with the previous lessons. Materials and resources required for each lesson were present. Records of assessments and work completed were recorded by the teachers and presented for each class observed.

**TEACHING AND LEARNING**

The observed lessons began with a roll call and the topics studied were the endocrine system and osmosis. Students sat in pre-assigned seats. When numbers are small reorganising students closer to the front of the laboratory should be considered as this will aid student engagement. A positive teacher-student rapport was evident in the lessons observed.

Homework was corrected orally through putting questions to named students. Probing techniques were used when required to develop and improve upon the students’ answers, which is very positive. The level of questioning varied. Recall was the main type used with some limited use of higher-order questions. The development and use of a variety of questioning techniques is recommended for all lessons. Student responses varied which indicated a good understanding and engagement by some, with other students being more passive in the learning. Direct targeting of questioning is required and recommended to ensure participation by all students in the lesson.

Lesson pace was in the main satisfactory. A balance between students’ activity and participation and whole-class teaching and questioning needs to be maintained. In addition sufficient time needs to be assigned to the assessment of learning during and at the end of the lesson. Students should also record key points of the lesson at appropriate times during the lesson. Homework was assigned in the lessons observed, which was designed to assist the students in learning and retaining the topic content. This is good practice.

Both theory-based and practical lessons were observed. The sharing of learning outcomes with the students was observed which is good practice. These learning outcomes should be the foundation of all lessons. As part of the summation of the lesson a return to the learning outcomes is recommended. This would assist in developing the lesson summary well as providing evidence for both the teacher and students of the actual learning which has occurred in the whole lesson. The use of a learning check during a lesson to assist in the assessment of student learning is good practice and should be used where possible in all lessons.

ICT was also used to provide visual images of the topics for the students and some subject-specific keywords were outlined in the presentation. This is good practice. The transfer of these words to a more permanent position, for example, the board should be considered in order that students are able to see them during the whole class. These terms could then form the basis for evaluating student learning during the lesson and could also be recorded by the student as part of their glossary of terms. The clarity and size of some text presented to the students must be checked to ensure visibility and learning is not compromised. In some instances the use of models, specimens and handouts were used to support the material presented electronically. This enhanced and in some instances was critical to the learning experience for the students. The use of such resources should be incorporated into lessons where possible.
In the main, students were able to complete the tasks and practical activities assigned by the teacher with assistance provided when required. Practical activities were conducted in groups of two students. Students’ abilities to write up the practical activity unaided and based solely on their experience varied. The development of this skill needs to be addressed. It should be an objective for the whole science department and should have its origin in Science at junior cycle. In the main students recorded their findings and constructed conclusions with the aid of the teacher and the text book. Examination of a sample of student practical note copies showed evidence of previous practical activities completed. In addition it was observed that these were monitored by the teacher with items for correction outlined to the student. The completion of the required corrections by the students should also be followed up by the teacher.

**ASSessment**

The school has prepared formal homework and assessment policies, which are awaiting ratification by the board of management. All teachers monitor the implementation of these policies on a daily basis.

Student progress is monitored on an ongoing basis. Formal tests are held at Christmas and at the end of the year. Certificate examination classes also sit pre-examinations in the spring of their examination year. Reports are sent to parents after all formal testing. There is an annual parent-teacher meeting for all classes. The work of all concerned is recognised and praised.

The school journal is also used to communicate information to parents in relation to student progress in the subject. School management analyses the results of the certificate examinations and the outcomes of the analysis are made known to the board of management and the teachers.

Informal assessment of students’ learning is achieved through various types of classroom activities, such as the correction of homework and oral questioning at the start of, and during, the lessons. These activities were observed during the evaluation. On completion of a unit of work or a topic, class tests are administered by the teacher. Results of all assessments are recorded and retained by the teacher. Students receive oral and or written feedback after class assessments. This is an important practice in helping students improve their performance.

Teacher folders housed a series of assessment papers including end-of-year and in-class examinations. The majority of these assessment papers reflect the style and layout of the past certificate examination papers. This is praised, as well as being further encouraged.

As part of future planning, the science team could decide on a minimum number of assessments required for each year group in a given time frame. This could then contribute to the grade of the student at formal examination time. Consideration should also be given to awarding all students marks for their practical copies as part of their overall grade in the subject. This could have the effect of providing the students with further motivation for engagement with the practical elements of the course.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- There was a good teacher-student rapport in evidence in the lessons observed.
- There was advanced preparation of the required resource material for the lessons observed.
- The time allocation for Biology is in line with the recommended timeframes in the syllabus, though the inclusion of a double lesson as part of the TY biology programme should be considered.
- Continuing professional development opportunities in Biology have been availed of by relevant staff.
- ICT is available and is being integrated into the teaching of Biology.
- A planning document has been developed for Biology.
- The science facilities that support the teaching of Biology and the other sciences have been recently refurbished.

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

- All future subject planning should include planning for the use of learning outcomes and active methodologies in the classroom.
- Consideration should be given to awarding all students of Biology marks for their practical copies as part of their overall grade in the subject.
- Further development of ICT in the teaching and learning of the sciences is recommended.

Post-evaluation meetings were held with the teachers of Biology and with the 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

The Board of Management would like to thank the Department of Education and Skills for the recent Biology inspection. The school has a long tradition of promoting Science and the Board sees this report as a mean of building this profile. The Board of Management would also like to note the annual Science Student of the year Award which is presented to the student in 6th year who has achieved the highest academic success in science at Leaving Cert level. This prestigious award is much sought after and is a means of promoting the sciences and of encouraging students to study science at senior level.

Furthermore the Board is delighted to see that the hard work and commitment of the Science department along with the level of rapport between students and teachers is commended by this inspection.

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

Future subject planning will include the recommendations of this inspection and a subject co-coordinator will be appointed to record minutes of meetings.

The practice of assessing practical copies as a component of house exams will be addressed by staff.

Exploration of the use of ICT is on-going.