Subject Inspection of Biology
REPORT

Cistercian College
Roscrea, County Tipperary
Roll number: 65410K

Date of inspection: 22 November 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN BIOLOGY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Cistercian College. 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 teacher, examined students’ work, and had discussions with the teacher. 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 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

Students study Science as a core subject for Junior Certificate with classes arranged on a mixed-ability basis. The subject has a weekly time allocation of three single lessons in first year and four single lessons in both second and third year. The syllabus states that a time allocation of one double lesson and two single lessons for each year of Junior Certificate is required. The implementation of this time is recommended.

An optional Transition Year (TY) programme follows Junior Certificate, where students study Biology as one of their subjects, with three single lessons allocated for this purpose. The introduction of a double lesson to facilitate practical work should be considered in future timetabling for this subject. Four science subjects are offered as part of the established Leaving Certificate programme. These are Biology, Chemistry, Physics and Agricultural Science. 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. Currently approximately half of years one and two of Leaving Certificate students study Biology and class groups are mixed ability in nature. The school operates teacher-based rooms and as a result all biology lessons occur in the laboratory. Some mathematics lessons also occur in the laboratory. While acknowledging that the teacher is a science teacher, nevertheless it is recommended in the Departmental publication Safety in School Science published in 1996 and subsequently amended in 2001 that subjects other than science subjects should not be taught in the laboratory. Therefore the school should adopt this policy to the greatest extent possible.

The science facilities comprise three laboratories and one preparation and storage area. The science facilities have undergone a recent refurbishment. The science team is in the process of reorganising the science facilities. Each of the laboratories is designated for a Leaving Certificate science subject with Junior Science occurring in all the laboratories. In completing the organisation of materials and equipment all laboratories should be set up for junior
Science in the first instance. The preparation area is still to be organised after the recent works. It is important to complete this work in a timely fashion to ensure its usability. The safe removal of the old damaged steel cabinet in this area should occur when its use is no longer required. As part of the organisation process, all chemicals should also be colour coded in accordance with Departmental guidelines. Information on the storage of chemicals can be obtained on the chemistry section of Professional Development Service for Teachers (PDST) website, [www.pdst.ie](http://www.pdst.ie).

A four-member science-teaching team is involved in the delivery of the science programmes on offer in the school, with one teacher involved in the delivery of the Leaving Certificate biology programme. No formal subject co-ordinator is appointed from this team. The team should consider the merits of appointing a co-ordinator and rotating this role amongst its members. This would contribute to the professional development of all members over time. Both formal and informal meetings are held and minutes recorded. No set budget is provided but management facilitates requests made by the team. The team should audit what equipment and resources are present and plan what will be required to allow for both the maintenance of resources and the further development of the sciences.

Some posters were displayed in the laboratory. This material needs to reflect work being completed in class and therefore be of use as an aid to enhance the students’ learning. Work which is of student origin is also to be encouraged. A television, overhead projector, data projector and laptop computer are some of the permanent resources within the laboratory. 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. This is good practice. The current statement is reviewed annually. There is a good level of safety equipment in the laboratories including fire extinguishers, safety blankets and safety glasses.

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 use of information and communication technology (ICT) should be considered in the preparation of these documents. Development into areas of teaching methodologies in Biology, keywords in Biology by topic, extracurricular links in Biology, and assessment and homework in Biology should be included in the planning documents. The networked ICT facilities should also be used to store all material developed by the science team. This could then be accessed by the teachers for use in teaching the sciences. A separate plan for TY students has also been devised. More specific details under the course content headings should be included in this plan, which would show differences between topics covered in TY and for certificate examination purposes. In addition the inclusion of the desired learning outcomes for the students should also be outlined in all planning documents.

Written plans were presented for the observed lessons. The lessons were structured to provide continuity with the previous lessons. Records of work and assessments completed to date with each class were presented. In addition, there was prior preparation of the variety of resources required for all lessons observed. Furthermore, revision plans had been developed for the examination class to aid their study of Biology.
TEACHING AND LEARNING

Students sat in pre-assigned seats on entry to the laboratory. The two observed lessons began with a roll call and the topics studied were classification of organisms and plant reproduction. Effective classroom management was evident, with a good teacher-student rapport observed during the lessons. Homework was corrected orally through questioning to named students. Feedback was given to students on the quality of their answer with probing techniques used when required to develop and improve upon individual student’s answer. This is very positive.

The lessons observed were theory-based with some follow up to practical work that had been completed. The pace of the lessons in the main suited the students’ level and abilities. Student learning was aided through a review of previous work at the start of the lessons. This is very important especially for students who were absent due to involvement in other school activities. Linkages were made to other topics previously studied which were also helpful for student learning. Consideration should be given to outlining to students the expected learning outcomes at the start of the lesson. Students’ would then know what is expected of them and could use it to self-evaluate learning. In addition, nearing completion of any lesson a return to the learning outcomes is recommended. This would assist in developing the lesson summary, note development of the topic as well as providing evidence for both the teacher and students of the actual learning which has occurred in the whole lesson.

Students’ engagement, learning and achievement were aided by a range of methodologies. Questioning was in the main directed at named students with mainly recall and some higher-order questions employed. A variety of student responses were observed which indicated a good understanding by some students, with other students more passive and not as actively engaged in the question and answer session. Attention to the quality and targeting of questioning is recommended.

In the main, students were able to complete the tasks assigned by the teacher. Help was provided by the teacher when required but it is also important that monitoring of the students’ work during task completion and outlining of inaccuracies also occurs, to ensure student learning. ICT was also used, which helped the visualisation of the topics for the students. The development of subject-specific keyword lists needs to be explored. Important terms could be put on the board, computer and overhead projector. Students would then be able to visualise them and these words could form the basis of revision of work completed during the lesson and recorded by the student as part of their glossary of terms.

Follow up to practical activities was observed in the lessons. Students’ ability to write up the practical activity unaided and based solely on their experience varied. The development of this skill needs to be addressed and should be an objective for the whole science department. In the main students recorded their findings and constructed conclusions with the aid of the teacher. Examination of a sample of student practical-note copies showed evidence of previous practical activities completed. 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.

Students were assigned learning and worksheet completion as homework at the completion of the lessons observed. In the main, this homework was designed to assist the students in learning and retaining the topic. This is good practice.
ASSESSMENT

The school has a formal homework and assessment policy. Teachers monitor the implementation of these policies on a daily basis. 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, assessment occurs, with class tests administered by the teacher. Results of all assessments are recorded and retained by the teacher. 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. This initiative could also be adopted by the science team as part of the science department’s assessment policy.

Formal student assessment occurs through tests at Christmas and summer. Certificate examination classes also sit pre-examinations in the spring of their examination year. Formal reports are issued on completion of all these assessments. Parent-teacher meetings are held for all classes annually. 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 with the outcomes of the analysis made known to the board of management and the teachers. The outcomes help in the further development of the subject in the school.

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.
- 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:

- It is recommended that junior cycle science classes have a time allocation of one double lesson and two single lessons per week for each of the three years, as recommended in the syllabus for Junior Certificate Science.
- Future planning should identify learning outcomes and active methodologies for use in the classroom.
• The depth and breadth of information in the TY plan under course content needs to be expanded.
• The inclusion of a double lesson as part of the TY biology programme is recommended.
• The awarding of some credits to the students for practical activities completed as part of their assessment schedule is recommended.
• ICT should be further developed and integrated into the planning and teaching of the sciences.
• The preparation area should be re-organised without delay to facilitate its effective use.

Post-evaluation meetings were held with the teacher of Biology and 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.

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