An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Biology
REPORT

Presentation College
Mardyke, Cork
Roll number: 62570R

Date of inspection: 29 September 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN BIOLOGY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Presentation 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 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

Science is a core subject for Junior Certificate students in the school. Students are assigned to classes on a mixed ability basis. A weekly time allocation of one single lesson and one double lesson in first year rises to two single lessons and one double lesson in second and third year for this subject. The syllabus for Junior Certificate Science recommends the latter arrangement for each of the three years of the junior cycle. Efforts should be made to implement this level of provision for all year groups.

Following Junior Certificate, students enter the compulsory Transition Year (TY) programme. Students study Biology as part of their TY science programme. On completion of TY students enter the established Leaving Certificate programme. Biology, Chemistry and Physics are the three optional science subjects offered to the students in the school. Option subject blocks are created based on student preferences. Currently approximately one third of years one and two of Leaving Certificate students study Biology. The arrangement of class groups for senior science subjects is mixed ability in nature. The school has a time allocation for all senior science subjects of one double lesson and three single lessons weekly in each year. This allocation is within curriculum guidelines.

The science facilities comprise four laboratories and one demonstration room. These facilities are well maintained and organised. The school employs a laboratory technician who supports the teaching of the science subjects in the school. Appropriately equipped preparation and storage areas adjoin the laboratories. The biology laboratory has its own storage area. The school operates teacher-based rooms. As a result all biology lessons occur in the laboratory.
A five-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. A subject co-ordinator is appointed from this team, a position which is currently part of a post of responsibility. The team should consider the merits of 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 or by individual teachers. The team should continue the ongoing development of the facilities as well as the maintenance of resources for the sciences.

A range of posters is displayed on the walls of the biology laboratory. Some of this work is of student origin, which is to be encouraged. All material displayed should reflect work being completed in class and therefore aid and enhance the students’ learning. A DVD player, data projector and laptop computer are some of the permanent resources within the biology 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 current statement was reviewed more than a year ago. There is a good level of safety equipment in the laboratories including fire extinguishers, safety blankets and safety glasses. The guidelines on safety: *Safety in School Science and Safety in the School Laboratory* published by the Department of Education and Skills are also available.

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.

Recommendations previously outlined in a science and chemistry subject inspection report completed in 2005 have, in the main, been acted upon and implemented. The science department and management are to be commended in this regard.

**Planning and Preparation**

Curriculum planning for Biology is well advanced. Planning documents for all senior biology classes were viewed. In addition to the course plan, other areas have been included in the subject plan. These include cross-curricular links in Biology, teaching methodologies in Biology, extracurricular links in Biology, and assessment and homework in Biology. This is good practice. TY students have a separate programme, which the teacher modifies when required to meet the needs, interests and abilities of the student cohorts. This is good practice. 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 could also be outlined. Years one and two of Leaving Certificate follow the same programme of work. Care must be taken in devising the plan when operating this approach to ensure students’ knowledge is being built upon during their course of study. Review and evaluation of all plans should be undertaken regularly to ensure their continued effectiveness.
The lessons observed were planned and 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.

TEACHING AND LEARNING

Students sat in pre-assigned seats on entry to the laboratory. The three observed lessons began with a roll call and the topics studied were classification of organisms, the amoeba and microbiology. Students set down to work quickly and were well behaved. Effective classroom management was evident throughout the lessons. This was aided in most cases by the teacher circulating the room regularly, asking questions or observing students completing their work. This also helped to build a good teacher-student rapport during the lesson.

The lessons observed were theory-based. The pace of the lessons in the main suited the students’ level and ability. Student learning was aided through a review of previous work at the start of most lessons. In addition, linkages were made to other topics which also helped student learning. In one instance the students were asked to brainstorm a particular topic. This was very successful and resulted in modifications to the planned work, taking account of the students’ knowledge, which is good practice.

Lesson objectives were outlined to the students in the observed lessons. 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. This could be used in conjunction with the established learning check by the teacher already occurring during some lessons. This methodology helped both the teacher and students evaluate the learning and address the difficulties experienced. In addition, nearing completion of any lesson a return to the learning outcomes is recommended. This would assist in developing the lesson summary as well as providing evidence for both the teacher and students of the actual learning which has occurred in the whole lesson.

A range of teacher-led methodologies was employed during the lessons observed to aid students’ engagement, learning and achievement. It is recommended that a balance between students’ activity and participation and whole-class teaching and questioning is achieved and maintained during all lesson types. Questioning was generally directed at named students. Both recall and higher-order questions were employed, which is good practice. Some student replies indicated a good understanding which, in turn, was positively affirmed by the teacher. However, in some lessons a core group of students were more passive and not as actively engaged in the question and answer session. Attention to the quality and targeting of questioning is recommended to engage such students.

The use of visual materials was evident in all lessons. PowerPoint presentations, over-head projections, charts and the white board were used to engage students and to develop learning points. The size and clarity of text and picture illustrations on occasions could have been larger to ensure students’ visualisation was not compromised. In some instances, key diagrams which were located in students’ textbooks and key points placed on the whiteboard were used to good effect to illustrate and develop learning and understanding.
Homework was given at the completion of most classes observed. Students were assigned learning, diagram completion or questions from their textbook. In the main, the homework assigned was designed to assist the students in learning and retaining what had been covered during the lesson. This is good practice.

No practical activities were observed in the lessons. An examination of a sample of student practical note copies showed evidence of previous practical activities completed. It was clear that these had been monitored by the teacher. This is good practice. The size of the TY biology class observed is greater than that which can allow completion of meaningful student-centred practical work in the biology laboratory in a safe manner. It is recommended that the size of the TY biology class be monitored by management to ensure students’ experience of the practical element of the subject is safe, positive and worthwhile for all.

**ASSESSMENT**

The school has no formal homework and assessment policy. As stated earlier planning documents for Biology have been developed and have procedures in place for these two areas.

Informal assessment of students’ learning occurs daily. This is achieved through various types of classroom activities such as the correction of homework, oral questioning at the start of and during the lessons, project-work assessment and practical activities. Some of these activities were observed in the lessons viewed. Continuous assessment also occurs with class tests being administered by the teacher on completion of a unit of work or a topic and or at mid-term. In addition students and their parents sign up to fifteen minutes’ study of Biology theory nightly. This is checked regularly by short-term tests in class which are peer-corrected. These like all tests are sent home for parents’ signature and comment. The teacher retains all assessment results. This is good practice.

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 these assessments. Parent-teacher meetings are held for all classes annually. The student journal and comments on homework are used to inform parents of student progress. The certificate examination results are analysed by school management. Laboratory copies when written up are checked by the subject teacher and a grade is awarded. This grade forms between ten and twenty percent of the total year grade for the subject. This is good practice particularly as it helps provide 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.
• Continuing professional development opportunities in Biology have been availed of by relevant staff.
• A good level of ICT is available and is being well integrated into the teaching of Biology.
• A planning document has been developed for Biology.
• The science facilities that support the teaching of Biology are well maintained and organised.

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

• The size of the Transition Year biology class needs to be monitored to ensure that practical work can be conducted in a safe and meaningful way.
• In keeping with the syllabus recommendations for Junior Certificate Science, four class periods per week should be provided to those students taking Science in each of the three junior cycle years; this allocation should include one double period.
• Future planning should include learning outcomes and active methodologies for use in the classroom.
• The depth and breadth of information on course content in the Transition Year biology plan needs to be expanded.

Post-evaluation meetings were held with the teacher 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.

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