Subject Inspection of Science and Chemistry

REPORT

Scoil Mhuire
Béal Átha an Ghaortha, Contae Chorcaí
Roll number: 70931T

Date of inspection: 16 September 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND CHEMISTRY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Scoil Mhuire, Béal Átha an Ghaorta. It presents the findings of an evaluation of the quality of teaching and learning in Science and in Chemistry, and makes recommendations for the further development of the teaching of these subjects in the school. The evaluation was conducted over one day during which the inspector visited the laboratory and observed teaching and learning. The inspector interacted with students and teachers, examined students’ work, and had discussions with the teachers. The inspector reviewed school planning documentation and teachers’ written preparation. 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

Scoil Mhuire is a small school with a warm friendly atmosphere where students are taught their subjects through the medium of Irish. It is clear that the sciences are in a strong position in the school. Junior Certificate Science and Leaving Certificate Biology are core subjects on the curriculum. Chemistry is an optional subject for Leaving Certificate. The commitment of management and the science department to the provision of the sciences is illustrated by the situation whereby small numbers, which are increasing, warrant the amalgamation of the fifth-year and sixth-year chemistry classes. Timetabling for the sciences supports the delivery of the curriculum.

Class groups are of mixed ability. An ethic to study science subjects to higher level is promoted among the student cohort and the uptake at the higher-level at both Junior Certificate and Leaving Certificate level is good. Decisions regarding the appropriate level for students in certificate examinations are taken in the spring of the examination year. The science teachers adopt a professional approach to their work and appropriate supports are in place to assists students with special educational needs.

The school has one laboratory with an adjoining preparation and storage area and this has a good level of teaching resources. The current laboratory causes difficulty for the completion of some aspects of the mandatory student practical work, particularly with larger class groups because there is an insufficient number of taps on the students’ benches. This should be addressed.

There is a good level of safety equipment in the laboratory. A significant amount of work has been done to ensure the safe storage of chemicals. Building on this good practice, it is recommended that a flame-resistant press be obtained to facilitate the safe storage of flammable
chemicals and the segregation of these from the oxidising chemicals. During the evaluation management raised a number of issues relating to the laboratory facilities. The school was strongly advised to attend to those relating to health and safety as a matter of urgency. Teachers have been facilitated in attending relevant science in-service education courses. One member of the science department is a member of the Irish Science Teachers’ Association and this facilitates sharing of good practice with teachers in other schools and awareness of innovative teaching and learning strategies.

School management supports the use of information and communication technology (ICT) as a teaching tool. A laptop computer and data projector are available for use by the science teachers and the computer room has internet access. Consideration should be given to the installation of a computer in the laboratory.

A good range of co-curricular and extracurricular activities are provided to enhance the scientific learning experiences of the students. These include fieldtrips and entries to the Lego Robot Building competition. Staff and students are working towards achieving a green flag environmental award for the school. A science club has been started recently to facilitate students in undertaking projects with a view to entering the BT Young Scientist and Technology Exhibition. The commitment of the staff to the provision of such activities which engender students’ interest in Science is praised.

PLANNING AND PREPARATION

A good level of co-operation exists among the members of the science department. Intermittent formal meetings are supplemented by ongoing informal collaboration. Currently, minutes of formal meetings are not compiled. It is therefore recommended that a record of the decisions made at these meetings be retained.

Good work has been achieved in the development of comprehensive subject plans in Science and Chemistry. The work outlined includes the aims and objectives of the syllabuses, the list of topics and sub-topics, assessment strategies and supports for students with special educational needs. It is recommended that the plans be broadened in time to include links between practical work and theory, resource requirements as well as continual revision work, when and where appropriate.

Lessons observed, as well as the planned programmes of work, were found to reflect syllabus requirements. Short-term planning was very good in the department and preparation for classes was noted as being at a very high standard. The very good level of advance planning facilitated seamless transitions from one phase of the lessons observed to the next. There was evidence of an impressive array of teacher-developed resources to support the teaching and leaning of the sciences through the medium of Irish.

TEACHING AND LEARNING

A good quality of teaching and learning was observed in the chemistry and science lessons. Classroom management was very good, and a pleasant and positive atmosphere prevailed, which
was conducive to teaching and learning. A very good teacher-student rapport was also evident. Student participation was warmly welcomed and encouraged, and responses were affirmed.

Lessons were well structured and the pace was appropriate. In particular, the structure and organisation of the lesson in which there were two class groups, was very good. Both independent and teacher-directed learning was separately facilitated for each class group. Clear explanations facilitated student learning.

The intended learning outcomes were clearly outlined at the start of the lessons observed. This is very good practice. It is recommended that these be used as a means of assessing student learning during the recapitulation phase of the lesson. The teachers should also explore the use of a range of other strategies when reviewing student learning. For example, students could be asked to devise their own questions and answers and put these to their peers. If a PowerPoint presentation is used at this stage of the lesson, it is suggested that questioning of students to ascertain their learning would occur prior to displaying the main points of the topic under consideration.

The effective use of the questioning stimulated student engagement throughout the lessons. Questioning was used successfully to evaluate students’ prior learning. Students’ responses indicated a good understanding and knowledge. Questioning was also successfully used to draw on students’ previous knowledge of a topic and to aid the introduction of and subsequent broadening of that topic. This is a good strategy and should be used to a greater extent.

Good use was made of the white board and the data projector to outline the main points and to provide visual images related to the topic. The latter also assisted students in developing an understanding of the concept under consideration.

In one lesson, students performed their practical work in an independent and safe manner and their practical skills were good. Students were observed to share their views and solutions readily, and to contribute confidently and supportively throughout group practical work. A plenary session was employed on completion of the practical activity to reinforce students’ learning of the underlying concepts of the experimental work undertaken. This is very good practice.

The good quality teaching reflected significant learning in the lessons observed. Students engaged readily with the classroom activities and they were purposeful in their work. They were encouraged to work independently and collaboratively. Students displayed a competence in their scientific and chemistry skills, and an understanding of concepts appropriate to their level of study.

ASSESSMENT

Assessment, for all classes, is carried out on an ongoing basis by questioning in class and by means of assigned homework. An examination of students’ copies revealed that consolidation of in-class learning is facilitated through written homework in many instances. This was monitored by students in the main. It is recommended that teacher-monitoring of homework be used judiciously in addition to student monitoring. It is recommended that teachers annotate students’ work with comments on areas where they need to improve, thus incorporating one of the strategies of Assessment for Learning (AfL)
Students have laboratory practical books in which they record their investigative work. These practical books are of a fine standard in the main. In one instance, a percentage of the marks for end-of-term assessments is awarded for students’ practical notebooks. This is good practice and should be extended across the department.

Assessment methods at the school reflect normal procedures. Formal tests are held for non-certificate examination classes at Christmas, Easter and summer. Certificate examination classes sit examinations at Christmas and have their pre-examinations in the spring. Following the formal examinations, a report is issued to parents. Parents are also informed of students’ progress at the annual parent-teacher meeting.

Currently the school does not conduct an analysis of the certificate examination results. It is therefore recommended that management and staff conduct such an analysis and that the results of this work are used to inform subject planning.

**SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- Junior Certificate Science and Leaving Certificate Biology are core subjects on the curriculum.
- School management and the science teachers are committed to providing as many science subjects as possible to Leaving Certificate higher level.
- Subject plans are well developed.
- The quality of teaching and learning in Science and in Chemistry is good.
- Teachers’ expectations for their students are high.

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

- Any issues relating to health and safety should be addressed as a matter of priority.
- A flame resistant press should be installed to facilitate safe storage of flammable chemicals.
- The intended learning outcomes set out at the opening of lessons should also be used when reviewing students’ learning at the end of lessons.
- It is recommended that teachers annotate students’ work with comments on areas where they need to improve.

Post-evaluation meetings were held with the teachers of Science and Chemistry 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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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 welcomes the report by the Inspectorate acknowledging the work of the Science Department.

We are very pleased that the high level of planning by the Science Department and the high quality of teaching and learning has been acknowledged.

The Board would also like to thank the Inspectorate for the professional and positive manner displayed during the 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

The Management and the Science Department procured a fire proof cabinet to store the flammable chemicals immediately after the Inspection.

To address the issues of Health & Safety in the Science Laboratory the Management (under guidance of CCVEC) applied to have the Laboratory refurbished under the SWS 2011.

It is a cause of great dismay for us that this application was not successful and, even though remedial steps have been taken to safeguard the health and safety of students in the laboratory, the laboratory should be refurbished in its entirety as soon as possible. The Management is appealing the decision at the moment.