Subject Inspection of Science and Chemistry
REPORT

Saint Mary’s Secondary School
Convent of Mercy, Charleville, County Cork
Roll number: 62450H

Date of inspection: 22 October 2009
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND CHEMISTRY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection as part of a whole-school evaluation in St Mary’s Secondary School, Charleville, County Cork. It presents the findings of an evaluation of the quality of teaching and learning in Science and Chemistry and makes recommendations for the further development of the teaching of these subjects in the school. The evaluation was conducted over three days during which the inspector visited classrooms 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.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

There is good support by the school for the study of the sciences as all students study Junior Certificate Science and at Leaving Certificate level Biology, Chemistry, and Physics are available to students. In addition, Transition Year (TY) students study modules of the Leaving Certificate science subjects during their TY programme. There is evidence of positive attitudes among students to studying Science as the uptake of higher-level Science is good and the level of uptake of Biology at senior cycle is very good and that of Chemistry and of Physics is satisfactory. Furthermore, students’ outcomes in the State examinations are generally very good.

The timetabling arrangements for Science are wholly appropriate and meet with the syllabus requirements. The time allocated for Chemistry meets with the total time required by the syllabus. However, an exceptional situation arose this year due to timetabling constraints whereby Leaving Certificate year one chemistry students do not have a weekly double lesson period. The school management is cognisant of the need to provide a weekly double lesson period for all senior-cycle science subjects and discussions with the principal revealed that this matter will be addressed in future timetabling arrangements.

All class groups are of mixed ability. They retain the same science teacher at junior cycle and the same chemistry teacher throughout their studies at senior cycle. This is good practice as it supports the continuity of students’ learning.

There are very good structures in place to support students in making their choices for the senior cycle. These include advice from teachers and the guidance counsellor, information evenings for parents, the use of a best-fit model to maximise the number of students getting their subject preferences, and the information gleaned by students by studying modules of the senior-cycle science subjects as part of the TY programme.
The science laboratories and the preparation rooms are clean, bright, well maintained, well organised and in very good repair. The science laboratories benefit from a good level of information and communication technology (ICT) equipment. There is a strong sense of the laboratories being a scientific learning space and this atmosphere is supported by the displays of students’ work, posters, charts, and scientific glassware and equipment. The science teachers are currently completing the reclassification of chemicals in accordance with best safety practice and Department of Education and Science guidelines and this is but one example of their diligent work.

The science staff supports the students in participating in a wide range of science-related extracurricular activities such as quizzes, the Young Scientist and Technology Exhibition, lectures by visiting speakers and trips to various science events. Students’ participation in such activities helps to support their interest in the sciences and gives them a broader appreciation of scientific knowledge and its application. The work done by the science staff in enabling and supporting students’ participation in such events is to be commended.

**Planning and Preparation**

There are good structures in place in this school to support subject planning. These structures include the position of a subject co-ordinator, which is a position that rotates among the science staff. This good practice enables all the staff to experience the full range of responsibilities associated with subject planning and co-ordination of the subject department. There are frequent formal and informal meetings among the science staff and minutes are kept of the formal meetings.

It was evident that the science teachers work very well together. They operate in a collegial and collaborative manner and this supports their work in planning. Provision is in place for a common programme of work to be followed and this is to be commended.

Written plans for Science, for Chemistry, and for TY Chemistry were viewed. The documents are generally informative and are well considered. Especially noteworthy in each plan was the section detailing the strategies that could be used with students with special educational needs. In building on the good work done in planning it is advised that the TY plan be extended to provide further detail of the topics being studied and the learning activities associated with them. Given the prominent status that the Transition Year has in the school this plan could form part of an information pack that could be given to parents and students prior to a student enrolling in the TY programme.

From an examination of the minutes of subject department meetings it was evident that operational matters and subject content are the main focus for planning. While much informal discussion takes place among the science teachers concerning all aspects of teaching and learning there is scope during subject meetings for the science teachers to share with each other the successful teaching methodologies that they use. It is recommended that future subject meetings focus on further developing the range of teaching and learning strategies that encourage students’ independence and an open-ended investigative approach to the sciences.
TEACHING AND LEARNING

There was very good preparation for all of the lessons that were observed. They were appropriate to the relevant syllabus and all materials were to hand and had been prepared in advance. The teachers showed a very high level of subject matter expertise and dealt confidently and competently with any questions that were posed by their students.

All lessons contained a variety of learning activities and students were engaged by these activities. Practical work was a feature of many lessons and this is wholly appropriate as science subjects have a large practical element. ICT was used in a number of instances and it was effective as a visual aid and as an interactive element of the lessons. The quality of the teachers’ questioning was very good and there were some very good examples where teachers moved progressively from lower-order questions to higher-order questions. Lessons were well structured and there was a logical sequence for all the lesson topics. The teachers’ explanations of scientific concepts were clear and concise. In a number of instances additional learning aids such as models were beneficially used to aid students’ learning.

The management of all lessons was very good and there was a very good atmosphere in all lessons. There was a sense of a positive learning environment that was characterised by mutual respect among the students and the teachers. The students were well behaved at all times. Their teachers showed high levels of care for them and there was a good rapport among the students and the teachers.

Discussions between the inspector and students revealed that they have generally good levels of interest in Science and in Chemistry. The students generally showed good competence in answering questions posed by the inspector.

ASSESSMENT

There are appropriate assessment practices in operation in the school with students being assessed regularly and reports being sent home periodically. There are good systems of communication between the school and parents. Foremost among these systems is the students’ journal.

An examination of students’ journals showed that the majority of homework is either written work based on exercises from the textbook or the learning of facts. Given the wide range of interests and activities available to students in the school there is considerable scope to extend the current homework practices. For example, homework assignments could more frequently include investigations that could be done at home, a small piece of research, the use of relevant newspaper articles, enabling students to use creative activities such as poetry, music and dance occasionally. Therefore, it is recommended that future planning focus on developing the types of homework assigned to students.

There is a practice among the science staff of rewarding students in the end-of-term examinations for the write up of experimental work and for good note keeping. In building on this good practice it is recommended that the science staff introduce a system of formally assessing students’ experimental skills. This does not require a full practical examination but rather could build on the existing good practices where the teachers circulate among the students as they perform their experimental work and advise, guide and provide feedback. The teachers could
inform the students of the assessment areas and criteria in advance and could assess a small number of students during each experiment. The focus for the assessment should be on providing formal feedback to students on the level of competence in using the range of skills necessary to perform experimental work.

Samples of students’ work were viewed during the inspection. Students had completed a satisfactory amount of experimental work and it was evident that homework was assigned regularly and was being monitored by the teachers.

The science staff has carried out an analysis of the students’ outcomes in the State examinations and this good practice is to be commended as it helps to inform subject planning.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The science staff is professional, dedicated and diligent in its work.
- Students’ outcomes in the State examinations are generally very good.
- The science facilities are very good.
- All lessons were very well managed and there was a very good atmosphere in all lessons.
- The quality of teaching and learning was good.

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

- Future planning should focus on developing the types of homework assigned to students.
- It is recommended that future subject meetings focus on further developing the range of teaching and learning strategies that encourage students’ independence and an open-ended investigative approach to the sciences.

A post-evaluation meeting was held 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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