An Roinn Oideachais agus Scileanna
Department of Education and Skills

Subject Inspection of Science and Chemistry
REPORT

Coláiste Ráithín,
Bray, County Wicklow
Roll number: 70821H

Date of inspection: 24 & 25 September 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 in Coláiste Ráithín as part of a whole-school evaluation. 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 this subject in the school. The evaluation was conducted over two days during which the inspector visited classrooms and observed teaching and learning. The inspector interacted with students and teachers, examined students’ work, and had informal 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 deputy principal.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

There is good support for the study of science subjects in this school. This is shown by the fact that all students study Science at junior cycle and that senior cycle students may choose to study Chemistry, and Physics or Biology. The creation of subject groupings at senior cycle is based on the students’ choices, coupled with consultation with parents and this is good practice.

The overall time allocation for Science meets with the requirements of the syllabus and for one class group an additional class period has been allocated. The time for Science is allocated, in the main, as two double lesson periods. This means that students have two class contact points per week with the subject. The rationale given by the school for this allocation was that it would facilitate students’ performance of and engagement in experimental work which is fundamental to the study of Science. The school reports that the arrangement is working well. The school is to be advised that flexibility exists to adopt an allocation of one double lesson period and two single lesson periods should the need arise to increase the number of class contact points per week.

The overall time allocation for Chemistry meets with the requirements of the syllabus. There are two double lesson periods and one single lesson period weekly in each year of senior cycle. The points made about junior cycle Science in the previous paragraph apply equally to Chemistry, with there being facility to move to one double lesson period and three single lesson periods each week. This may prove to be most useful for students in their final Leaving Certificate year.

There is a very significant uptake of science subjects by students at senior cycle. The Transition Year (TY) programme, which is compulsory in this school, includes a module relating to Physics. The inclusion of tasters of senior cycle subjects is considered to be good practice, as it enables students to make well-informed decisions when choosing subjects for the Leaving Certificate. It is recommended that, subject to resources being available, the school extend the provision of science subjects as part of the TY programme and include Chemistry and Biology, with a focus on experimental work in all of the science subjects.
All class groups at junior cycle are of mixed ability. They retain the same teacher throughout their study of Science. This supports continuity of student learning and is to be commended.

There are two science laboratories in the school and there is one preparation room. The preparation room is in very good condition and materials are stored appropriately. Very good work has been done by the science teachers in creating kits for each experiment at junior cycle and this work is to be commended. Both of the laboratories have a sense of being a scientific learning space and both are in satisfactory condition to meet the requirements of teaching and learning science subjects. A particularly noteworthy feature in the laboratories was that students’ work was on display in each laboratory. This is to be commended as it helps to foster in students a sense of ownership and pride in their surroundings and their work.

There is a good level of information and communications technology (ICT) equipment available to the science teachers. Documentation provided by the school showed that teaching and learning resources are made available as needs arise. Classroom observation showed that ample resources and equipment were available for the lessons observed.

There is good support by the school for the teachers’ continuing professional development (CPD). The teachers have engaged enthusiastically in their own CPD and this was borne out by the records that were examined during the evaluation.

The science teachers are very supportive of students’ participation in science-related extracurricular activities. A range of activities including trips to the Young Scientist and Technology Exhibition, various lectures, science quizzes and visits to chemical plants are facilitated and enabled by the teachers. The very good work done by the teachers in supporting students in such a range of activities is to be commended.

**PLANNING AND PREPARATION**

The quality of the work done in planning and preparing for the teaching and learning of Science and of Chemistry is very high in this school. Appropriate structures are in place to support the teachers in their planning work with a planning co-ordinator in place and the teachers meeting formally at very regular intervals. Minutes are kept of the formal meetings and this is good practice. In addition to formal meetings, the science staff meets informally throughout the week. The nature and content of the documentation that was supplied and discussions with school management revealed that the science teachers work well together in a co-operative, collegial and collaborative manner.

Of particular note was the very good work done in creating a special workbook for junior-cycle science students. Among other items this workbook included the relevant vocabulary for each topic and the key points of the topics. In addition, it included a self-assessment checklist where students identify for each lesson the personal skill on which they will focus and at the end of the lesson they assess their success in achieving their goal. This shows that students’ learning is the focus of the educational activity and it helps students to take responsibility for and be aware of their own learning. The work completed is praiseworthy.

A very comprehensive science plan and a separate and no less comprehensive chemistry plan were viewed during the evaluation. They contain useful information that beneficially informs the
Teaching and learning of the subjects. A particularly noteworthy feature included in the
documentation was the information relating to students with special educational needs (SEN). It
was evident that there is a high level of care for these students and that the teachers are aware of
the SEN students and of what would best meet their individual learning needs. This is to be
commended.

**TEACHING AND LEARNING**

There was a very high level of preparation by the teachers for all the lessons observed. All
requisite materials were to hand and had been prepared in advance. The teachers showed a very
high level of subject matter expertise and they dealt comfortably and knowledgeably with all of
the topics they taught.

The atmosphere in each lesson was relaxed, informal and positive. There was a strong sense of
mutual respect between the teachers and their students. The students were all addressed by name
and they responded positively to their teachers. The teachers were affirming of all students’
contributions.

Classroom management was generally very good with the students being well behaved and the
teachers showing good leadership and management skills. In the very few instances where
students’ engagement wandered from the topic under study, the teachers gently refocused the
students on the task at hand.

A variety of teaching and learning methods was used effectively in all lessons that were observed.
There was very good use of experimental work and good practice was noted in many aspects of
this work. For example, students were active in setting up for and cleaning up after their work.
This teaches them to plan for their work and to take responsibility for it. Students were also
encouraged to make observations as they worked and this is good scientific practice. During the
experimental work, the teachers circulated among the students and provided individual advice and
guidance where necessary. ICT was used well in many lessons, mainly as a visual aid to help
students more clearly understand the structures or processes that were being studied. The style of
questioning used by the teachers was mainly to direct questions at named students and there was
some very good use of higher-order questions that encouraged the students to consider and
explain the concepts being studied. It would be optimal if all lessons have an opportunity for
students to consider and respond to higher-order questions. Recapitulation, repetition and
reinforcement of students’ learning were used well throughout the lessons observed.

Irish was the main language of instruction and very good practice was observed where the
teachers explained new terms through Irish without recourse to English. In instances where
English was used, the teachers explained that this was necessary due to the language abilities of
certain students. All of the teachers paid a high level of attention to ensuring that the students
were familiar with any new scientific terms and this is to be commended.

Interaction between the inspector and the students revealed that they had good levels of interest in
Science and in Chemistry. They were competent in answering the questions that were put to them
and they showed satisfactory understanding of the topics under study.
ASSESSMENT

Students’ progress is assessed regularly and reports are sent home periodically. The arrangements that are in place for formal school assessment are appropriate. The documents that were examined during the evaluation showed a very high standard in the teachers’ record-keeping.

As well as a formal written examination, the summer and Christmas examinations for Science also include credit for students’ experimental work, project work and the design of a poster. This practice of assessing and rewarding students for a range of skills related to their studies is to be commended. It is recommended that the science staff build on this good practice by assessing and rewarding students for the practical skills they gain throughout their studies. Such assessment could take place as the teacher circulates during lessons when students are performing experimental work and should include areas such as manipulation of apparatus, observation skills, teamwork, the quality of the results and conclusion, and students’ competence in communicating the outcomes of the work.

Generally, students’ outcomes in Science and in Chemistry in the State examinations are good in this school. An analysis of the results obtained by students in Chemistry was included in the documentation that was examined. It is recommended that the science teachers undertake annually an analysis of students’ results in the State examinations. It is understood that this analysis is currently undertaken by the principal and deputy principal. This analysis will serve to affirm the good work done by the teachers in preparing their students for the State examinations and will also prove useful in identifying trends in results which should inform the subject-planning process.

Examination of students’ copybooks showed that homework is a regular feature of their learning. There is a high level of monitoring of students’ homework by their teachers with teachers taking up the copybooks very frequently. This is good practice. In marking students’ work the teachers may find some useful advice on www.ncca.ie relating to assessment for learning. The quality of students’ write up of experimental work was generally very good and a satisfactory quantity of work had been completed relative to the students’ year group and the time in the school year at which this evaluation occurred.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The science and chemistry staff is dedicated, enthusiastic and professional in its work.
- There is a very significant uptake of science subjects by students at senior cycle.
- The facilities and resources for teaching and learning Science and Chemistry are wholly appropriate.
- The quality of the work done in planning and preparing for the teaching and learning of Science and of Chemistry is very high in Coláiste Ráithín.
- The quality of the atmosphere in, management of, methodologies used and learning in the lessons observed was very good.
- Generally, students’ outcomes in Science and in Chemistry in the State examinations are good in this school.
As a means of building on these strengths and to address areas for development, the following key recommendations are made:

- It is recommended that the science staff build on the current good assessment practices by assessing and rewarding students for the practical skills they gain throughout their studies.
- It is recommended that the science teachers undertake annually an analysis of students’ results in the State examinations.
- It is recommended that, subject to resources being available, the school extend the provision of science subjects as part of the TY programme and include Chemistry and Biology, with a focus on experimental work in all of the science subjects.

Post-evaluation meetings were held 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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