Subject Inspection of Science
REPORT

Rossa College
Skibbereen, County Cork
Roll number: 71090E

Date of inspection: 14 December 2010
REPORT ON THE QUALITY OF LEARNING AND TEACHING IN SCIENCE

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Rossa College. It presents the findings of an evaluation of the quality of teaching and learning in Science 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 laboratories 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 teacher’s written preparation. 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

Rossa College is a small post-primary school with a warm friendly atmosphere that also caters for Post Leaving Certificate (PLC) students. It also has a purpose-built unit in which education is provided for students with autism. Rossa College is participating in the Delivering Equality of Opportunity in Schools (DEIS) programme. The students in the school participate in the Junior Certificate School Programme (JCSP).

The support of management and the science department for the provision of Science is good. Science is a core subject at junior cycle. This is positive as this form of provision is in line with the government’s objective of developing a scientifically and technologically literate society. The school provides as broad a curriculum in science as is possible. Given its small size, it is not feasible to provide all of the science subjects for Leaving Certificate. Currently, Biology and Agricultural Science are the two science subjects provided. Overall, the uptake of these subjects is good. However, the school should explore strategies that would encourage student uptake of the physical sciences for Leaving Certificate.

The time allocation for the delivery of Science is slightly below that recommended in the syllabus. While acknowledging that the reduced time in first year is due to the good practice of operating a subject-sampling system for the optional subjects, nevertheless the school should examine strategies that would address this shortfall in the latter years of junior cycle. Class-contact time is spread across the week in almost all instances. However, one class group has two single lesson periods of Science on the same day. This should be avoided, as it is more appropriate for lessons to be distributed across the week.
A good level of resources and equipment has been provided to support the teaching and learning of Science. There are two laboratories, one of which is dedicated solely to the teaching of Science. This laboratory is decorated with scientific charts and thus provides a visually stimulating learning environment. Building on this good work, it is recommended that students’ work be displayed as a means of celebrating their progress and achievement. Storage and preparation areas adjoin the two laboratories. The science department has begun to organise the equipment and resources into separate project boxes for each of the mandatory investigations for Junior Certificate. This is good practice. As part of this work, it is suggested that the science department conduct an audit of its resources. This audit would assist in planning for the acquisition of future resources. A plastic tunnel and a garden area, which are used to grow various plants, are also available to support the teaching and learning of the sciences.

One of the two laboratories, which is not designated for the teaching of Science, has interactive whiteboard technology. This is positive. In the absence of this technology in the designated science laboratory, the science department should use the resources in the other laboratory as needed and, in this way, enhance the integration of information and communication technology (ICT) into the teaching and learning of Science.

There is a good emphasis on health and safety in the science department in Rossa College. Safety rules are displayed in the laboratory. The school has a health and safety statement and this is reviewed on a regular basis. Some work has been done on the safe storage of chemicals. However, it is recommended the chemicals be colour coded and stored according to the guidelines of the Department of Education and Skills and best safety practice.

Currently, in line with the DEIS programme, the school is in the process of examining approaches that would enhance academic attainment among the student cohort and that would achieve increased higher-level participation in the certificate examinations. This is strongly recommended as the uptake of Science at higher level for Junior Certificate is currently low.

There are good links between the science department and the learning-support department. As an element of future planning, consideration should be given to developing resources to support the teaching of Science to students with additional educational needs.

Management supports and facilitates continuing professional development in the sciences. Co-curricular and extracurricular science activities form an integral part of the school’s science curriculum and these include participation in visits to farms and linking with the horticulture section of the school. This is good practice.

**Planning and Preparation**

A subject plan has been devised for Junior Certificate Science. The subject plan outlines various aspects of science planning including the mission, aims and objectives for the subject, and record-keeping procedures. The plan also deals with the teaching programme for all year groups and this programme includes suggested key teaching points and the associated mandatory experiments. To build on this good progress, the subject plan should be extended to include timeframes and resources linked to specific topics. The key teaching points should be extended to incorporate the intended learning outcomes. In time, an overarching science plan should be developed to integrate the programmes of work for the Leaving Certificate and the Post Leaving Certificate science subjects.
The work of the department is co-ordinated by a teacher and this position is rotated. This is good practice. Formal meetings between members of the science department are held annually. It is suggested that, at these meetings, the department could reflect and share their practice in relation to effective strategies for teaching and learning.

TEACHING AND LEARNING

A good quality of teaching and learning was evident in the science lessons observed. Prior preparation of equipment and resources facilitated the smooth transition from one phase of the lesson to the next. The lessons observed were well structured and the pace was appropriate. The objectives of the lessons were outlined at the outset. Building on this good practice, it is recommended that, from the outset, the objectives of the lesson be outlined in the form of intended learning outcomes. This would ensure that students have a clear understanding of the learning that should take place. The intended learning outcomes should also be revisited during the recapitulation phase of the lesson to assist in ascertaining the learning that has occurred.

In the lessons observed, content was clearly communicated and clear explanations facilitated students’ understanding of the scientific concepts. Questioning was used effectively to ascertain students’ learning and, in some instances, probing questions were effectively employed to advance the development of the lesson.

Practical work formed the kernel of the lessons observed. These lessons were well organised and there was an appropriate emphasis on safety. Students were encouraged to work collaboratively and were well supported by their teacher as they performed their practical activities. There was some evidence of the use of the investigative approach to Science when students were asked to predict the results of the investigation to be carried out. In accordance with syllabus requirements, this approach should be used to a greater extent. On completion of student practical activities, plenary sessions were successfully employed to consolidate students’ learning. This is good practice.

In the lessons observed, efforts were made to make the scientific concept under consideration both concrete and tangible. For example, whole-class discussion on the effect of using grit on roads covered with ice and snow, and the types of tyres used on cars participating in formula car racing, stimulated students’ interest and assisted in the development of students’ understanding of friction. This is positive.

There was some evidence of a focus on the development of students’ literacy in the science lessons observed. In this context it is recommended that teaching and learning methodologies similar to those used with students following the JSCP should be used with all students who study Science. These strategies include the display of the key-word lists in the laboratory and the use of key-word notebooks.

Classroom management was very good and a pleasant and positive atmosphere prevailed which was conducive to both teaching and learning. A very good teacher-student rapport was also evident. Student participation was warmly welcomed and encouraged by the teacher, and responses were affirmed. The students’ enjoyment of, and engagement in the lessons was evident. The students’ interactions with the inspector demonstrated good levels of comprehension.
ASSESSMENT

Assessment methods at the school reflect normal procedures in post-primary schools. Formative assessment, for all classes, is carried out on an ongoing basis by questioning in class and by means of assigned homework. Ongoing monitoring of students’ progress is achieved through topic tests and formal whole-school examinations. A report is issued to parents following these assessments. It is good to note that the school conducts an analysis of students’ performance in the certificate examination. Consideration should be given to including this analysis in the subject plan in order that it could more easily inform subject planning and teaching and learning.

All students had a laboratory workbook in which they recorded all their investigative work. These are of a good standard. The practice of monitoring and annotating students’ written homework and practical work is good. The inclusion of practical work in the scheme of continuous assessment is recommended, as it provides motivation for engagement by all students with the practical element of the course.

A very good level of contact is maintained between the school and parents. In addition to reports, contact is maintained through parent-teacher meetings that are held annually for all classes.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Science is a core subject in junior cycle.
- The use of formative assessment and the practice of monitoring and annotating students’ written homework and practical work have a positive impact on students’ learning.
- A good level of resources and equipment has been provided to support the teaching and learning of Science.
- Significant progress has been made in the development of the science subject plan.
- A high quality of teaching and learning was evident in the science lessons observed.
- A very good rapport was observed between the teacher and the students.

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 chemicals be stored in accordance with Department of Education and Skills guidelines and best safety practice.
- In line with the requirements of DEIS planning, strategies to increase the uptake of Science at higher level in the Junior Certificate examination should be developed and implemented.
- The science subject plan should be extended to include intended learning outcomes, timeframes and resources linked to specific topics.
- To enhance students’ literary skills, it is recommended that JSCP teaching and learning methodologies be used with all students who study Science.
Post-evaluation meetings were held with the teacher of Science and with the principal at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

Published, April 2011