Subject Inspection of Science
REPORT

CBS James Street
Basin Lane, Dublin 8
Roll number: 60410I

Date of inspection: 28 January 2011
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in CBS James Street, Dublin. 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 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 and subject teachers. 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

CBS James Street offers Science as a core subject. Part of the resource allocation to the school is used to create three small class groups in each year of junior cycle. Class groups are streamed according to ability in each year of junior cycle, with two of the three class groups following the Junior Certificate School Programme (JCSP).

There is good science provision at senior cycle. The school offers Biology and the subject Physics and Chemistry combined at senior cycle. Each subject is offered on alternate years. Science is also offered as an elective course as part of Leaving Certificate Applied (LCA). It is praiseworthy that there is good uptake of each of these options.

Students and parents are well supported regarding subject and programme choice at senior cycle. An information evening for parents regarding choice of senior subjects and programmes is convened annually. Programme coordinators, subject teachers and the school guidance service inform students about senior cycle programmes and subjects available to study in the school.

Time allocation to Science at junior cycle is satisfactory with students receiving four single class periods per week. Time allocation to senior Biology is also satisfactory with one double and three single class periods allocated each week. There are five single class periods allocated to Physics and Chemistry combined. The timetabling of science subjects should be planned in future years to ensure that neither one is timetabled twice on the same day. In addition, it would be good practice as deemed necessary by the teachers, to timetable one double period per week for all science subjects. This practice would help to ensure that a sufficient time period is available for the completion of student practical work.

The school has three well maintained teacher-based laboratories and one science preparation room. School management has made an application in the current year to the Summer Works Scheme of the Department of Education and Skills for an enhancement of these facilities. Any planned refurbishment should include better chemical storage facilities. Science equipment is
stored in an orderly manner and each laboratory is enhanced with posters and charts. Access to the laboratories is good and all science lessons are scheduled in a laboratory. Information and communications technology (ICT) facilities in the laboratories have been enhanced with computers, data-projectors and an interactive whiteboard. This equipment was well utilised during the evaluation.

Teachers of Science are deployed to junior and senior classes in accordance with their qualifications. Teachers are encouraged and facilitated to attend relevant in-service courses and to enhance their ongoing professional development. Many have availed of in-service opportunities. For example, teachers have participated in the Digital Hub Crickets and Lego Project in the past. On request from teachers, the board of management will cover the cost of membership of professional associations and it is suggested that teachers give consideration to taking this opportunity to enhance their ongoing professional development.

The school has a health and safety policy with a section on Science in place. However, the policy is in need of review and it is recommended that this review takes place in the near future. Safety equipment was present in each laboratory and laboratory rules were on display.

Students are encouraged to partake in a range of co-curricular and extra-curricular activities. These include Science Week activities, quiz competitions and visits to third level institutions including Institute of Technology Tallaght and Dublin Institute of Technology. To further enhance students’ awareness of science events and competitions and to raise the profile of Science, it is recommended that a science notice board be put in a prominent place in the school.

**PLANNING AND PREPARATION**

Formal subject planning meetings take place once per term. In addition, the science department meets informally on an ongoing basis to plan, monitor, review and evaluate their work. Minutes from meetings provide evidence of consistent and worthwhile science department planning. Issues on the agenda of recent science department meetings included resources, common planning and trips.

The current science coordinator voluntarily undertakes the role of convening department meetings, and updating the department plan. This is praiseworthy. It is suggested that the experience of coordinating Science be undertaken by other members of the science department so that capacity building within the science department is increased.

A wide-ranging science plan addressing science provision at junior and senior cycle has been drawn up collaboratively. A key feature of this plan includes planning for students with special needs. Areas covered include effective use of school library facilities, differentiated instruction and the use of visual aids and key word charts. This plan should be expanded to include long-term goals for science development in the school, results analysis of state examinations and particularly trends in results, formative assessment, teacher professional development, laboratory resources and the use of ICT in teaching and learning. Common programmes of work were also made available at the time of the evaluation. It is recommended that future programmes should include methodologies, resources and assessment strategies for each section of the course.

Very effective pre-planning for lessons was in evidence. Practical equipment was set up in advance and was ready to use. The content of lessons was well planned overall.
TEACHING AND LEARNING

The structure of lessons was good overall. There was a good sense of continuity with effective links to students’ prior learning being established. Lesson objectives set out at the start of most lessons were achieved. This practice should be extended to all lessons. The pace of lessons was appropriate and teachers used differentiated strategies to help ensure that learning for all students was prioritised. During some lessons students were afforded the opportunity to read a short excerpt from the textbook with the teacher correcting any errors. This is good practice and improves student confidence in reading. The classroom rapport was very good.

The quality of learning and teaching was high in a number of lessons with good emphasis on activity based learning. Science was made relevant to students’ everyday experiences and a positive and affirmative environment for learning was created. Students received individual support when needed and most students worked confidently on their assigned tasks.

Very good examples of students’ participation in lessons were observed. During one lesson observed on the theme of the effects of smoking, the links with lung cancer and heart disease were fully discussed and consolidated by the exemplary use of ICT in the form of a short video clip. Lesson outcomes were reinforced by the use of a fact sheet on smoking, a student worksheet and a very good plenary where the key words and concepts in the lesson were reviewed. In some lessons, however, measures should have been put in place to improve involvement and participation of students. These measures could have included classroom discussion, the inclusion of student activities and providing students with the opportunity to give feedback during the lesson. The provision of a handout with key words would also help to consolidate the learning experience of students.

Some lessons were overly teacher-led with limited opportunity given to students to make an effective contribution. It is recommended that further opportunities for students to participate in and contribute to the lessons should be built into the planned programme.

Methodologies were varied in most lessons. During one lesson visited on the theme of the human respiratory and circulation systems, the board was expertly used as an aid to learning. Strategies used included student activities and targeted, challenging questions on the parts and functions of each system. Key words were highlighted on the board as the lesson progressed. ICT was well utilised in some lessons. However, there was scope overall during the lessons observed for the greater use of ICT, including internet resources, short animations, applets or videos.

Interest was heightened in many instances by the use of probing questions. Students exhibited good confidence in answering questions on their work. Questioning was used as an ongoing learning strategy and complemented the investigative approach to learning adopted.

ASSESSMENT

School examinations take place at Christmas and summer with pre-examinations for third and sixth-year classes in February. In addition, class tests are administered at the completion of each topic. Records of tests, quality of homework and attendance are well maintained by teachers. Examination results are analysed by senior management. It is suggested that trends in examination results form part of school planning in future years. A parent-teacher meeting is held.
annually for each year group. Communication with parents is ongoing with reports sent to parents on two occasions during the year.

There is close liaison between the science department and the learning support department regarding students with additional needs, including those with special needs. Target plans are incorporated into the science programme as necessitated by the JCSP programme. Workbooks, keyword charts and summarised lesson notes are all well utilised in support of students.

Records of homework and of practical investigations are generally of good standard. However, in an effort to improve the standard of all, it is necessary to further monitor and annotate notebooks and copies to help ensure that students consistently maintain work of high quality. This will also promote and raise student attainment. The science department should consider allocating a portion of the marks of term examinations to completion of the student record of practical work. Appropriate homework was assigned at the conclusion of all lessons visited.

The success rates and the trends in the uptake of higher-level for Science should be monitored and included in future target setting. Formative assessment strategies that are integrated into the day-to-day classroom activities should be introduced to help ensure that a larger proportion of students achieve to their ability in Science.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Science is a core subject at junior cycle with Biology and Physics and Chemistry combined offered to senior cycle students.
- The laboratory is maintained to a good standard with equipment stored in an orderly manner.
- The extent of junior science planning is good. Effective planning was in evidence in advance of lessons observed.
- Good differentiated teaching practices were in evidence in all lessons.
- The quality of learning and teaching was high in a number of lessons with good emphasis on activity based learning.
- Science was made relevant to students’ everyday experiences and a positive and affirmative environment for learning was created.
- Strong links have been established between the science and learning support departments.

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

- Teachers should take the opportunity provided by the school to join their subject associations.
- The science plan should be expanded to include long-term goals for science development in the school.
- Future programmes should include methodologies, resources and assessment strategies for each section of the course.
- Strategies should be put in place to improve the involvement and participation of students in their lessons.
• Ongoing formative assessment strategies integrated into the day-to-day classroom activities should be introduced to help ensure that a larger proportion of students achieve to their ability in Science.
• It is recommended that students’ work be further monitored and that consideration be given to allocating a portion of the marks of term examinations to completion of the student record of practical work.

A post-evaluation meeting was held with the teachers of Science, together with the principal, at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.