Subject Inspection of Science and Physics
REPORT

Rathdown School,
Glenageary, County Dublin
Roll number: 60090Q

Date of inspection: 23 and 24 September 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND PHYSICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Rathdown School, Glenageary, Co. Dublin. It presents the findings of an evaluation of the quality of teaching and learning in Science and Physics and makes recommendations for the further development of the teaching of these subjects 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 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 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

Class groups are of mixed ability in junior cycle at Rathdown School, where junior Science is offered as a core subject. Science provision in the compulsory Transition Year (TY) programme is very good, with each class group receiving a twelve-week module of Physics, Chemistry and Biology. There is very good science provision at senior cycle with Physics, Chemistry and Biology offered to students each year. TY students and parents are very well supported when making subject choices for Leaving Certificate. The uptake of Biology and Chemistry at senior cycle is good. However, the number of students opting for Physics has declined substantially in recent years. The school has undertaken measures to support the subject and is commended for this. Nevertheless, school management is urged to further promote Physics to improve numbers taking the subject for the Leaving Certificate.

Time allocation to Science at junior cycle and to the range of science subjects at senior cycle is in line with syllabus recommendations. TY students are allocated two double class periods over a twelve-week period. The distribution of class periods across the week is mainly good. However, the timetabling of a class group for Science for three consecutive days, which occurred in the current year, should be avoided in the interests of class continuity over the week. While acknowledging the value of the morning school assembly, constant vigilance is required to ensure that morning classes start on time and that valuable tuition time is not eroded.

There are five teachers in the science department in the school. Teachers are very well supported by the school in attending in-service courses, in following relevant continuous professional development (CPD) courses and are supported in their membership of a professional subject association.

Two well-equipped and well-maintained science laboratories are in operation in the school, both of which have access to a storage and preparation room. The creation of a timetabled access system for the laboratories would improve laboratory access and is therefore recommended. The school employs the services of a laboratory technician. Materials are ordered by the laboratory technician in consultation with the science teachers and senior management. Very good ICT
facilities, including computers, broadband internet access and interactive whiteboards have been provided in the two science laboratories. Occasional use is also made of the adjacent demonstration room. The school intends to build three new science laboratories as part of future developments planned.

There are good health and safety practices in the science laboratories as evidenced in the course of the evaluation. The school’s health and safety policy has been reviewed and updated in 2008. Good practice would suggest that it be reviewed every two years. Safety equipment was in evidence and laboratory rules are on display. There are some very good practices already in place for chemical storage. However, it is recommended that an upgrade of chemical storage provision be implemented in line with best practice and Department guidelines.

Students with additional needs are very well supported. There is close liaison between science teachers, parents, school management and the learning support and guidance departments.

Students are encouraged to partake in a number of co-curricular and extra-curricular activities. The school regularly participates in the BT Young Scientists’ Competition and in Science Week activities. The teachers of Science demonstrate a proven commitment to their subject and to the provision of these activities which enrich greatly the learning of Science.

**PLANNING AND PREPARATION**

Formal science department planning meetings are convened by the co-ordinator of Science once per term. Co-ordination of the subject is on a voluntary rotating basis and duties, such as the chairing and maintaining minutes of meetings, are agreed. This is good practice. A review of minutes confirms that many relevant issues are discussed. These include the updating of the science plan and schemes of work, safety, laboratory access and co-curricular activities. In addition, the science team meets informally on an ongoing basis. The science team works very well together in planning science provision in the school.

A collaborative and comprehensive science plan, which outlines in detail current science provision in the school, was made available in the course of the evaluation. The plan focuses on key areas such as provision for students with special needs, assessment, resources, teaching methodologies and co-curricular activities. Teachers demonstrated excellent commitment in drawing up the science plan. To build on the excellent work completed to date, the science department should focus on the development of science education at junior and senior cycle into the future. This would involve the setting of long-term goals, action planning, planning for the further sharing of best practice between teachers in the science department and across the school.

Agreed schemes of work for each year group at junior cycle and senior cycle are detailed in the plan, each one outlining the topics to be taught in the course of the year. It is recommended that the topics in these schemes be explicitly linked to teaching strategies, methodologies, resources and assessment. Teachers maintain very good records of students’ assessment, attendance and homework. This material is recorded in teachers’ journals and on the shared school computer network. This is very good practice.

A good TY plan for each of Physics, Chemistry and Biology was made available during the evaluation. While the content of these plans is very good, it is recommended that each plan be written up using the template outlined in the Department guidelines on writing the TY programme. The science department may wish to develop TY science modules into transition
Further details, including a teachers’ handbook on designing transition units, are available on the website of the National Council for Curriculum and Assessment, www.ncca.ie/transitionunits.

There was very effective individual planning in evidence in advance of all lessons observed. Practical and ICT equipment were set up and ready to use. Lesson content was well planned which led to successful learning outcomes as evidenced during the evaluation.

**TEACHING AND LEARNING**

The quality of teaching was very high. Students’ motivation and interest were maintained throughout all lessons. The very good atmosphere and positive classroom rapport supported student learning and led to very successful learning outcomes. Affirmation of students was evident in all lessons. The positive atmosphere led to very high levels of participation. Science and Physics were made relevant to everyday life in many lessons. In one lesson, for example, the historical development of the theme of the lesson was very good. Students applied themselves to the assigned tasks with confidence and enthusiasm and were very knowledgeable in their understanding of concepts and facts encountered in class. Students were challenged to critically analyse the material presented and the high expectations of teachers helped ensure they lived up to this challenge.

Each lesson evaluated had a clear structure and there was very good continuity with prior learning in many lessons. Students were made aware of lesson objectives in many lessons and this practice should be extended to all lessons. The order of activities in some lessons should also be reconsidered. In addition, the choice of topic appropriate to a particular year group should be evaluated by the science department to ensure that students are always sufficiently challenged by the theme of the lesson.

Methodologies were varied and made a very effective contribution to student learning. Practical work, practical demonstrations and ICT were used very effectively across many lessons. The interactive white boards were very well utilised in the delivery of lessons. Key words and concepts were highlighted and diagrams were developed as an aid to focus and consolidate lesson material. The overhead projector was used in some lessons to complement the interactive board. Students’ own work was used in some lessons to review the theme of the lesson. For example, in one lesson observed on the theme of conservation and pollution, students’ own project posters on recycling and pollution were used expertly and integrated effectively into the lesson. Worksheets and handouts were distributed to students during some lessons. These materials were well utilised focusing students’ attention on key aspects of the lesson. This practice should be extended to other lessons, where appropriate, so that consolidation of prior classroom learning can be further reinforced.

There was very effective use of questioning in all lessons observed. Questioning was used as an ongoing learning strategy and interest and motivation were heightened in many instances by the use of probing questions. Teachers addressed questions from students expertly and the clarity of explanations was noteworthy. Students exhibited very good confidence in answering questions on their work during the lessons observed.

Practical demonstrations, student investigations and hands-on activities formed the core of some lessons. For example, during one lesson evaluated, following a teacher demonstration, students used microscopes to observe cells. Students were encouraged to discuss their observations in
groups. During a lesson on the theme of energy, very effective demonstrations on energy conversion consolidated the student learning experience. In addition, students were required to research material in advance of the lesson with one student gaining the opportunity to present to the entire class on the theme of solar cookers. This is very good practice, as it led to further discussion and debate. In another instance, students worked in small groups to investigate the properties of magnets. There was a very good emphasis on the investigative approach to learning, with good student focus on prediction, experiment and conclusions. All practical work was conducted in a safe and orderly environment.

Classroom management practices were very good which resulted in the creation of a positive and supportive learning environment.

ASSESSMENT

Homework and assessment procedures are clearly documented in the science plan. This is very good practice. There is very good emphasis on regular homework, class testing and revision as evidenced in the course of the evaluation.

Students’ academic achievement and the uptake of higher-level for Science and Physics is very good and the proportion of students receiving a high grade in these subjects has been consistently very good over recent years.

All students are assessed regularly in class and parents receive reports of ongoing progress. For example, parents of TY, fifth and sixth-year students receive monthly reports. This is very good practice. Common testing takes place as appropriate. TY students are also assessed on an ongoing basis through projects and presentations. Third-year and sixth-year students sit pre-examinations in February. Parents also receive reports following the Christmas, summer and pre-certificate examinations. Communication with parents is ongoing in many ways, including school events, telephone contact, information nights and through the school homework journal. Teachers maintain very good records of student assessments. A parent-teacher meeting is held annually for each year group.

Practical notebooks and students’ work examined in the course of the evaluation were maintained mostly at a very high standard. The quality of teacher comment and annotation was very high overall. Teachers were aware of the immense benefits to students of formative assessment.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- There is very good science provision at both junior and senior cycle, including TY. Science is offered as a core subject at junior cycle and Physics, Chemistry and Biology are offered each year at senior cycle.
- A collaborative and comprehensive science plan was made available in the course of the evaluation.
- There was very effective individual planning in evidence in advance of lessons observed.
- The quality of teaching was very high.
- Students’ motivation and interest were maintained throughout all lessons.
The very good, positive classroom atmosphere led to very successful learning outcomes. Methodologies were varied and made a very effective contribution to student motivation and learning. The uptake of higher-level for Science and Physics is very good. Student attainment in certificate examinations is consistently high. Assessment practices are very good with collaborative planning in place regarding examinations.

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

- The creation of a timetabled access system for the laboratories is recommended.
- Chemical storage provision should be implemented in line with best practice and Department guidelines.
- To build on the excellent work completed to date, the science department should, through its planning, focus on the development of science education at junior and senior cycle into the future.
- TY science plans should be drawn up in line with Department guidelines.

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

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