

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Science and Biology
REPORT**

**Wilson's Hospital School
Multyfarnham, Co. Westmeath
Roll number: 63300Q**

Date of inspection: 16 December 2010



**A N R O I N N | D E P A R T M E N T O F
O I D E A C H A I S | E D U C A T I O N
A G U S S C I L E A N N A | A N D S K I L L S**

REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE AND BIOLOGY

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Wilsons's Hospital School, Multyfarnham. It presents the findings of an evaluation of the quality of teaching and learning in Science and Biology 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 the 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

Wilson's Hospital School, a co-educational secondary school, has a current enrolment of 393 students. The school provides the Junior Certificate, Transition Year (TY) and Leaving Certificate (Established) programmes and the Leaving Certificate Vocational Programme (LCVP). Science is a core subject at junior cycle and it is also provided in the compulsory TY programme. It is commendable that the school provides the full range of science subjects, Agricultural Science, Biology, Chemistry and Physics, at senior level.

Classes in Science in first year are mixed ability while in second and third year they are streamed on the basis of students' performance and progress to date. All junior science classes are allocated one double and two single periods each week. TY students are allocated one double period each week for the study of Science. Subject option lines for fifth year are based on students' choices. The number of students choosing Biology is very encouraging. One double and three single periods are allocated weekly to Leaving Certificate Biology.

At present, there are four teachers of science subjects in the school and they are all deployed in line with their qualifications. Teachers are allocated to classes in order to provide continuity throughout junior or senior cycle, a good practice which facilitates long-term planning. Teachers have been released by school management to attend relevant continuing professional development (CPD) events.

Three laboratories, two of which are of relatively recent construction, are available for teaching the sciences. These facilities are well organised and best use is being made of them. All three rooms are equipped with computers and two have data projectors. Although non-science classes may use them on occasion, the laboratories are always prioritised for science classes and all students have laboratory access at least weekly. The collaboration and planning among teachers to maximise access for all class groups is commended.

A storage and preparation room is sited between the two newer laboratories. This room is neat and well ordered. It is recommended that the rearrangement of chemicals, according to the colour-coded storage method, be completed at an early date.

There is a very good display of charts and posters, including student work, on the walls of the older laboratory. It is recommended that similar displays be mounted in the newer laboratories and on the corridors outside where students' project work could be displayed along with notices of upcoming events in the sciences, courses and careers information, topical articles from newspapers and magazines and photographs of relevant student activities and outings. This will serve to encourage and motivate students and to promote the sciences. In addition, it is suggested that opportunities such as Science Week, held annually in November, be availed of to invite guest speakers into the school or to organise relevant visits to out-of-school sites.

The school has a health and safety statement which was drawn up with appropriate consultation and which is reviewed annually, in keeping with best practice. Safety equipment available in the laboratories includes first aid kits, gas and electricity isolation switches, fire extinguishers and fire blankets. It is recommended that, in order to enhance health and safety provision, simplified safety notices be displayed in a prominent manner in the laboratories.

PLANNING AND PREPARATION

There was evidence of a strong sense of collegiality among the teachers of Science and this is laudable. The science department is informally co-ordinated by one of the science teachers and it is recommended that this role be formalised at an early date. It is suggested that, following a needs analysis within the department, a written schedule of co-ordinator duties be agreed to facilitate this process and to ensure that all relevant functions are accounted for. This role should be rotated amongst the science teachers at suitable intervals, allowing each co-ordinator time to develop leadership skills and establish routines before handing over to the next co-ordinator.

At present, the science team meets formally at the beginning of the school year, to review planning and prepare for the year ahead. Additional meetings, formal and informal, take place as needed and there is continuous ongoing contact between the science teachers to discuss planning issues and to manage matters of more immediate relevance. Management allocates a budget to the science department each year, for the purchase of equipment and consumables. Teachers expressed satisfaction with the level of support provided.

The science department has prepared a good long-term plan for Junior Certificate Science in the School Development Planning Initiative (SDPI) format. It is commendable that this plan includes a detailed schedule for the delivery of course content over the three years of junior cycle. It is recommended that the plan be enhanced by the inclusion of more detail in relation to teaching methodologies, in order to ensure that teachers do not unwittingly restrict themselves to a preferred dominant style of teaching and to ensure that material is taught in a manner appropriate to the material itself and to the students being taught. Additional detail linking assessment techniques to desired learning outcomes for students would also serve to enhance the science plan. It is recommended that the Leaving Certificate biology plan be similarly extended. It is further recommended that the members of the science department carry out a detailed annual analysis of students' performance in the state examinations. Using the information gleaned from these analyses, action plans, focussing on how the level of student attainment might be further enhanced, should be drawn up and implemented.

Individual teacher lesson planning is good and lessons were in line with planning documents. The teachers were well prepared for class and, in all cases, due cognisance was given to the needs and abilities of the students in setting out and delivering the lessons. Materials prepared in advance of the lessons, including electronic and other resources, and the apparatus required for demonstration and student-centred investigative work, were integrated successfully into lesson delivery.

TEACHING AND LEARNING

The quality of teaching, as observed in the lessons visited, was uniformly good. Teachers were enthusiastic, warm and considerate of students and demonstrated a professional and business-like approach to work. The level of student-teacher interaction in classrooms was relevant to the task at hand and teachers worked hard to create a supportive learning environment during all lessons. Teachers demonstrated good classroom management skills and ensured that all students were included in the teaching and learning process.

Students were attentive, interested and anxious to participate in the learning process. They were challenged by lesson content and responded well. The topics covered in the classes observed included the endocrine system, solubility and crystals and food tests. Lessons were well paced and purposeful and good progress was made in all cases. Continuity from previous lessons was good and new information was well linked to previous learning. Lessons were mostly well structured. However, it is recommended that the learning intention of the lesson be shared with students at the beginning of lessons, ideally in the form of desired learning outcomes. This will give direction to the lessons and provide a basis upon which teachers can summarise the lesson content at the end of the lesson, and upon which homework can be given.

Methodologies appropriate to lesson content were used in all lessons observed. These methodologies included questioning of students, teacher explanations, discussion and student practical work. There was a good balance between teacher-led and student-focussed phases in lessons. Subject-specific terminology was well used in almost all lessons although, on occasion, greater emphasis should be placed on such terminology. The level of individual attention given to students facilitated a differentiated approach to teaching. This was evidenced by the manner in which teachers moved around the classrooms assessing students, assisting and supporting them, and encouraging them to perform to the best of their abilities.

Questioning of students was used effectively, to establish levels of prior knowledge, to assess the quality of learning on an ongoing basis and to assist in the exposition of new material. Lower order questions were used to test recall and in the review of prior learning at the beginning of lessons. More challenging higher order questioning was used, at various stages in lessons, to encourage students to think more deeply. In most instances, a good mix of directed and global questioning techniques was used.

Practical work, as observed in a number of lessons, was well managed and was carried out efficiently and safely and was characterised, in all cases, by an investigative approach, encouraging students to examine their findings and draw appropriate conclusions. Students wore eye protection while engaged in practical work in one lesson and it is recommended that full appropriate use be made of available protective clothing. Students demonstrated a good level of skill when carrying out their various tasks and they displayed a mature approach to their work. Bench work was preceded by plenary sessions when teachers ensured that students were fully briefed on the work to be carried out. It is important that practical activities are always followed

by a second plenary session at which the students are given an opportunity to review their work and rationalise their findings.

Students were assigned homework at the conclusion of all lessons. This homework was appropriate to the lesson content and was designed to assist each student in learning and understanding the topic in question.

ASSESSMENT

Arrangements for assessing and monitoring students in Wilson's Hospital School are appropriate. Ongoing assessment by teachers of students' progress is carried out through questioning, examination of homework and general observation of students, as noted in class by the inspector. Students displayed a good level of knowledge and understanding in the course of lessons and during interaction with the inspector. Outcomes in the certificate examinations have been satisfactory in recent years.

Students in non-examination classes are formally assessed at Christmas and prior to the summer and common examinations are used whenever possible. Progress reports are sent to their homes on both occasions. The progress of students in the certificate examination classes is monitored regularly for the first term and, in the second term, these students sit mock examinations. Progress reports are issued at Christmas and following the mock examinations. Additional testing is at the discretion of individual teachers.

Students were frequently affirmed for their efforts during the course of in-class interactions with teachers and they responded to this in a positive manner. However, it is equally important that they are affirmed and encouraged in relation to written work. While the quality of students' laboratory notebooks was very good in some cases, the quality was uneven overall and the level of monitoring and provision of feedback was not consistent. It is important that students' written work is affirmed and that their copybooks and laboratory notebooks are regularly monitored and feedback provided in order to encourage improvement. It is recommended that teachers agree common standards for students' written work and implement a common approach to monitoring and correcting this work and to providing quality feedback to students.

Good practice in relation to monitoring and recording student attendance and attainment was evident. The quality of record keeping by teachers was very good and sufficient information was recorded, facilitating teachers to build up a profile of each student.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- There is good whole-school support for the study of Science and Biology in Wilson's Hospital School. The school supports a full range of science subjects on the senior cycle curriculum.
- Planning for the provision of Science and Biology is evident and formal and informal meetings of the science teachers facilitate continuing development.
- Good quality teaching was noted in all lessons observed. Classroom management was good and there was a good rapport between students and teachers.

- Students were challenged by their teachers and they responded well. They engaged well in the learning process.
- An appropriate system of formal and informal assessing and monitoring of students' work is in place.
- A variety of appropriate and well-chosen methodologies were put into practice in lessons.

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

- It is recommended that displays of student project work, posters and charts be mounted in the newer laboratories and on the corridors outside, along with other relevant material to promote the sciences.
- It is recommended that the role of science co-ordinator be formalised at an early date and, following a needs analysis within the department, a written schedule of co-ordinator duties be agreed.
- It is recommended that the science and biology plans be enhanced by the inclusion of more detail in relation to teaching methodologies and additional detail linking assessment techniques to desired learning outcomes for students. It is further recommended that the members of the science department carry out a detailed annual analysis of students' performance in the state examinations.
- It is recommended that teachers agree common standards for students' written work and implement a common approach to monitoring and correcting this work and to providing quality feedback to students.

Post-evaluation meetings were held with the teachers of Science and Biology and 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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