

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Science
REPORT**

**Coláiste Chathail Naofa
Youghal Road, Dungarvan
County Waterford
Roll number: 72220T**

Date of inspection: 12 November 2010



**AN ROINN | DEPARTMENT OF
OIDEACHAIS | EDUCATION
AGUS SCILEANNA | AND SKILLS**

REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN SCIENCE

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Coláiste Chathail Naofa, Dungarvan. 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 deputy 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

Science is offered as an optional subject to junior cycle students and Biology is offered to senior cycle students at Coláiste Chathail Naofa. Currently there is one small class group in each year of junior cycle. First-year class groups are of mixed ability with streamed class groups in second and third year. The lower stream has not been offered Science in recent years. Students sample Science for a week before choosing their junior cycle subjects. These measures have contributed to substantially less than half of the student cohort opting for Science. The school should make substantial efforts to raise the profile of Science and to increase the cohort of students opting for Science. The subject should be sampled for an extended period and extra supports in making an informed choice should be put in place for parents and students. It is noted positively that Science will be offered to all students in future years.

Students and parents are well supported regarding subject and programme choice at senior cycle. Programme coordinators, subject teachers and the school guidance service provide an insight for students into senior cycle programmes and subjects available.

Time allocation to Science at junior cycle is satisfactory with one double and three single class periods per week. Time allocation to senior Biology is also satisfactory with one double and three single class periods allocated each week. The timetabling of Science and Biology should be planned in future years to ensure that neither is timetabled twice on the same day.

The school has one laboratory which is well maintained with equipment stored in an orderly manner. The laboratory is enhanced with posters and charts. Access to the laboratory is good and all science lessons are scheduled there. Information and communications technology (ICT) facilities in the laboratory are good with a computer, data-projector, whiteboard and data logging equipment. This equipment was well utilised during the evaluation.

Teachers of Science are deployed to junior and senior classes in accordance with their qualifications. At present some teachers are teaching exclusively at junior cycle. It is recommended that all teachers of Science are assigned to the teaching of junior Science as well as

their senior science specialism. This allows for diversity of teaching experiences at junior and senior cycle. It is recommended that senior management takes this into consideration when timetabling teachers to Science. Teachers are encouraged and facilitated to enhance their ongoing professional development and have availed of many in-service opportunities.

The school has a health and safety policy in place, incorporating a section on Science. Safety equipment was in evidence in each laboratory and laboratory rules were on display. The health and safety policy should be reviewed in the near future.

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 the BT Young Scientists Competition. To further enhance students' awareness of science events and competitions, a science notice board should have a prominent place in the school.

PLANNING AND PREPARATION

Senior management provides time for subject planning and meetings for this purpose are formally organised 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 planning. Issues on the agenda of recent science department meetings included resources, health and safety, reporting, and Junior Certificate School Programme (JCSP) target setting. This is very good practice.

The science coordinator position is currently based on seniority. Coordination of Science is effective and responsibilities undertaken include convening subject meetings, organisation of assessment, ordering equipment and selection of textbooks. It is recommended that capacity building be increased in the science department with more equitable allocation of teaching and co-ordination duties within the resources of the school.

A wide-ranging science plan addressing science provision at junior and senior cycle has been drawn up collaboratively. Over the coming years, this plan should be expanded to include long-term goals for science development in the school. Areas worth addressing include analysis of state examination results, uptake of science at junior cycle, formative assessment and the use of ICT in teaching and learning.

Very effective planning was in evidence in advance of lessons observed. Practical equipment was set up and was ready to use. The content of lessons was well planned. This very good lesson planning led to the intended learning outcomes being achieved.

TEACHING AND LEARNING

A positive and affirmative environment for learning was created in all lessons. The classroom rapport was very good. The quality of learning and teaching was high with a good emphasis on activity-based learning. Students, for the most part, were motivated to learn and encouraged to do so by being sufficiently challenged. Very good differentiated teaching practices ensured that students' levels of participation were high. Students received individual support when needed and most worked confidently on the tasks assigned.

The structure of the majority of lessons was good. There was a good sense of continuity with effective links being established with students' prior learning. Lesson objectives should be shared with students at the outset and reinforced by key aspects of lessons being summarised at the conclusion. The pace of lessons was good.

Students were active in learning. For example, during one lesson observed on the theme of the human circulatory system, students worked in small groups on the successful completion of an assigned task following a very effective demonstration.

Methodologies were varied with high levels of student participation in all lessons. The board was well utilised to highlight key words. ICT was also well utilised in some lessons; however, there was scope for the appropriate use of ICT in a number of lessons. It is recommended that further use of the data-projector, internet and CD resources be introduced at appropriate intervals in relevant lessons. For example, the use of short animations, applets or videos would have enhanced learning in some instances. Demonstrations were well utilised in the delivery of some lessons. In one case, a well planned demonstration investigating if the air has weight was effective in advancing student learning.

Probing and challenging questions ensured that learning was maximised and interest was heightened in many instances. Students appeared confident when answering questions on their work during the lessons observed and student outcomes in terms of skills and knowledge were very good. There was effective use of questioning in all lessons observed. Questioning was used as an ongoing learning strategy and complemented the investigative approach to learning adopted.

Some lessons were teacher-led with little opportunity given to students to make an effective contribution. It is therefore, recommended that when planning for lessons, further opportunities for students to participate and contribute should be built in. The use of appropriate worksheets in some lessons would have consolidated the learning experience of students.

Increased uptake of higher-level science provides evidence that students are being challenged to reach their potential. Ongoing formative assessment integrated into the day-to-day classroom activities should help ensure that a larger proportion of students achieve to their ability in Science. In addition, monitoring of uptake and attainment at higher-level should form part of science planning.

ASSESSMENT

School examinations take place at Halloween, Christmas, mid-term, Easter and summer with pre-examinations for third and sixth-year classes in February. In addition, tests are administered at the end of each month and at the completion of each topic. Records of tests, quality of homework and attendance are well maintained by teachers. Examination results are analysed by teachers and compared to national norms. This should inform future science department planning. A parent-teacher meeting is held annually for each year group. Communication with parents is ongoing with reports sent to parents on four occasions throughout 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.

Relevant homework was assigned at the conclusion of all lessons visited. Records of homework and of practical investigations are generally of good standard. However, in order to improve the quality of all, there is a need to further monitor and annotate notebooks and copies to ensure that students consistently maintain work of high quality. This would also help to promote and to 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.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- 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.
- The quality of learning and teaching was good.
- There was effective use of questioning in all lessons observed.
- Good differentiated teaching practices were in evidence.
- Participation in lessons was good, with links to relate Science to students' everyday experience working particularly effectively.
- Strong links have been established between the science and learning support departments.
- Assessment practices are effective and results are regularly communicated to parents.

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

- The school should make efforts to increase the cohort of students opting for Science.
- The subject sampling period for first-year students should be substantially increased.
- The timetabling of Science and Biology should be planned in future years to ensure that neither is timetabled twice on the same day.
- Capacity building should be increased in the science department with more equitable allocation of teaching and co-ordination duties within the resources of the school.
- The scheme of work for Science should be linked to the syllabus and should also be linked to areas such as methodologies, resources and assessment.
- Self-directed learning and more student activities should be incorporated into lessons.
- ICT should be further integrated into the teaching and learning of Science.
- Further monitoring and annotation of practical notebooks should be undertaken to ensure that students consistently maintain notebooks of high quality.

A post-evaluation meeting was held with the teachers of Science, together with the 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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