

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Science and Physics
REPORT**

**Coláiste Chill Mhantáin
Burkeen, Wicklow, Co. Wicklow
Roll number: 76099B**

Date of inspection: 27 September 2012



**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 PHYSICS**

INFORMATION ON THE INSPECTION

Dates of inspection	25, 26, 27 September 2012
Inspection activities undertaken <ul style="list-style-type: none">• Review of relevant documents• Discussion with principal, deputy principal and teachers• Interaction with students	<ul style="list-style-type: none">• Observation of teaching and learning during seven class periods• Examination of students' work• Feedback to principal, deputy principal and teachers

MAIN FINDINGS

- The quality of teaching and student learning were very good.
- Differentiation was in evidence in all lessons to cater for the range of students' abilities.
- The science and physics plans are well developed, are reviewed each year and are reflective.
- Teachers were very well prepared for lessons and resources and equipment were sourced in advance.
- Students were enabled to engage actively in their learning, were challenged appropriately, and developed many key skills during lessons.
- Innovative use of various methodologies including information and communication technology (ICT) advanced and supported student learning and understanding.
- A wide range of assessment strategies were used to evaluate students' progress.

MAIN RECOMMENDATIONS

- The schemes of work for Science and Physics should be developed further by linking each learning outcome to its assessment strategy and to resources to be utilised and teaching methods to be employed.
 - Assessment for learning practices should be extended to place a positive focus on formative written feedback to students as a means of directing their future learning.
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INTRODUCTION

Coláiste Chill Mhantáin is a designated Community College which operates under the patronage of County Wicklow Vocational Education Committee (VEC). The Archdiocese of Dublin is a partner in this school which has a current enrolment of 743 students. The college offers a range of programmes including the Junior Certificate School Programme (JCSP), the Leaving Certificate Applied (LCA) programme, the Leaving Certificate Vocational Programme (LCVP) and a compulsory Transition Year programme. Science is offered as a core subject at junior cycle and Physics, Chemistry, Biology and Agricultural Science are options at senior cycle. Science forms part of the compulsory TY programme.

TEACHING AND LEARNING

- Teachers were very well prepared for lessons. Resources, materials and equipment were sourced in advance. Intended learning outcomes were clear, differentiated as necessary and shared with students in the majority of lessons. This good practice should be extended. In addition, the majority of lessons were appropriately summarised in advance of setting homework assignments.
- Classroom interactions were respectful and students were affirmed and encouraged for their efforts and contributions. In some lessons, students received encouragement through a good merit system. The quality of teaching and student learning and the atmosphere for learning were very good.
- Differentiation was in evidence in all lessons to cater for the range of students' abilities. Students taking the JCSP were well integrated into all classroom learning and specific methodologies used supported students.
- Students were enabled to engage actively in their learning, were challenged appropriately, and developed key skills including good observation skills, problem-solving and critical thinking skills during many lessons.
- In a minority of lessons, the pace of learning was such that opportunities to consolidate the learning of some key skills were not developed. Therefore, it is recommended that, having checked students' understanding, that some lessons be adjusted to cater for student needs and for important development of key skills. In particular, there should be additional focus on graph-drawing skills, accuracy, practical errors and precautions.
- Laboratory space as an effective learning environment was very well utilised in some lessons. The board was used to highlight key words and concepts and as an aid to problem solving in many lessons. In this way, students' literacy and numeracy skills were developed and supported.
- Good focus and attention was placed on subject-specific language. This is praiseworthy as it supports scientific literacy development. However, all students should be encouraged to maintain a keyword copy as this practice was not evident in all classrooms. Teachers should collate results of feedback received from students on the board as an aid to further focus learning.
- ICT was used in an innovative way to develop and support student learning and understanding. The further use of photographs linked to key words and the use of ICT as a means of introducing students to practical applications of Science and Physics is recommended.
- A wide range of assessment strategies was used to evaluate students' progress. All modes of assessment supported student learning. Formative assessment was used as a means of encouraging students to reflect on and improve on the quality of their work. However, the further use of assessment worksheets by students during practical investigations is recommended.

- The overall quality of students' laboratory notebooks and copybooks is good. This is supported in some cases by teachers' positive annotation of students' work and oral feedback to students. This approach should be extended to place a renewed focus on formative written feedback to students as a means of directing their future learning.
- Teachers demonstrated a high level of competence, expertise and skill in the management, organisation and delivery of lessons. Teachers had high expectations of students commensurate with their abilities and learning styles.
- There was effective use of appropriate and challenging questioning in all lessons observed. Best practice was demonstrated when questions were directed at individual students. A good depth of knowledge and understanding was demonstrated by students.
- The clear focus on homework assignments and correction was a key assessment feature of all lessons. Examination results are analysed and student academic achievement is monitored. Targets for improvements in student attainment should be set and the setting of these targets should be informed by close examination of trends in state examination results.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

- There is very good provision for science education in the school. The uptake of Chemistry should be carefully monitored with a view to ensuring that sufficient numbers of students choose the subject in future years. Currently, very few girls are choosing Physics for Leaving Certificate. The school should attempt to address this imbalance through developing the profile of Physics for girls.
- Students are very well supported in making an informed subject choice for Leaving Certificate.
- Time provision for all science subjects is in line with syllabus recommendations.
- The five science laboratories and preparation areas are very well organised and maintained. Access to the laboratories for double periods is very good.
- Students are encouraged to partake in a number of co-curricular and extra-curricular activities including the BT Young Scientists' Competition and Science Week events.
- Formal examinations take place on two occasions throughout the year and reports are sent to parents following each examination.
- Laboratory ICT facilities are good and include data-projectors, computers and internet access.
- In-service and relevant continuing professional development (CPD) courses are supported for all science teachers. Teachers who are new to the Science department are very well supported by colleagues and school management. A teacher professional development strategy should be developed as part of science department planning.

PLANNING AND PREPARATION

- The science and physics plans are well developed, are reviewed each year and are reflective. The future development of the plan should include a section on long-term targets for the development of Science and Physics, include a literacy and numeracy strategy and details of how Assessment for Learning (AfL) strategies may further support learning in Science education. The schemes of work should be developed to link each learning outcome to its assessment strategy and to resources utilised and teaching methods employed.

- The content and focus of the TY plan for Science is very good overall. The future focus of TY planning should be on skills development. The school should consider subject specialist teaching for each TY module. This may help encourage increased uptake of the physical sciences.
 - Minutes of science department meetings reveal a collaborative approach to subject planning. Topics discussed include teaching methodologies, laboratory equipment requirements and future development of the subject.
 - It is praiseworthy that the school has addressed many of the recommendations made in a previous science inspection report.
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The draft findings and recommendations arising out of this evaluation were discussed with the principal, deputy principal and subject teachers at the conclusion of the evaluation. The board of management was given an opportunity to comment in writing on the findings and recommendations of the report, and the response of the board will be found in the appendix of this report.

Published April 2013.

Appendix

School response to the report

Submitted by the Board of Management

Area 1: Observations on the content of the inspection report

Upon meeting with the Inspectorate and the publication of the Inspectorate Report, the Science department and School Management are very much affirmed by this process both from a planning perspective and in terms of the positive engagement of our students. The Inspectorate acknowledged our Good Merit System which ensures that the positive interactions of our students are acknowledged on a daily basis by all subject teachers. We have found that this system permeates throughout the school and affirms our students thus resulting in the “respectful” interactions and “high expectations” noted by the Inspectorate.

Since our amalgamation, in 2011, we have developed Subject Planning based on a collaborative approach to planning by our teachers. This approach, over a short period of time, has now resulted in the quality of teaching and learning being “very good”. The sharing of expertise within each department continues to enhance the classroom experience of each student. Science has mixed ability classes and it is encouraging to see that the Inspectorate has noted that “differentiation was evidenced in all lessons”. This is an acknowledgement of our curriculum planning for an inclusive school. In light of the nationwide focus on literacy and numeracy, planning has focussed on subject specific language and our Science/Physics Department has driven this agenda within the students’ experiences of the subject.

Finally, it is most generous for the Inspectorate to acknowledge as “praiseworthy” how we in this school ensured that the recommendations resulting from previous inspections in our amalgamating schools was addressed.

Area 2: Follow-up actions planned or undertaken since the completion of the inspection activity to implement the findings and recommendations of the inspection

It is noted that few girls are taking Physics currently at senior level however there is a natural imbalance between male/female as a result of an all-boys Secondary School and a mixed gender VEC school. This issue is abating at Junior Cycle and will project into Senior Cycle in time. This situation coupled with our Careers Information and Subject Information mornings may provide a platform of change into the future. However, due to a commitment to have a broad subject range from time to time there will be imbalance. We would suggest that this is more advantageous to timetable the subject with the gender imbalance rather than drop the subject due to a gender imbalance. The teaching groups in our school are in the main self-selecting. Annually, the uptake levels of all subjects are closely monitored under many areas.

Although we would contend that subject planning is at a highly advanced stage considering our short history we will work toward linking the exact assessment strategy and resource to the exact learning outcome. Notwithstanding this commitment, we are confident that the Science Department, in practice, interpret their planning document in a way that benefits assessment and applies the appropriate assessment to the related outcome.

We are committed to developing AFL within the school and will have further inservice on this mode of assessment during the next academic year.