

An Roinn Oideachais agus Scileanna

Department of Education and Skills

**Subject Inspection of Mathematics
REPORT**

**Coláiste Dhúlaigh Post Primary School
Coolock, Dublin 17
Roll number: 70330Q**

Date of inspection: 24 November 2010



**AN ROINN | DEPARTMENT
OIDEACHAIS | OF EDUCATION
AGUS SCILEANNA | A N D S K I L L S**

REPORT ON THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Coláiste Dhúlaigh Post-Primary School conducted as part of a whole-school evaluation. It presents the findings of an evaluation of the quality of teaching and learning in Mathematics and makes recommendations for the further development of the teaching of this subject 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, examined students' work, reviewed school planning documentation and had discussions with the principal and members of the mathematics department. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal and the mathematics teachers.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

The time allocated to Mathematics in Coláiste Dhúlaigh is in line with syllabus guidelines; all junior-cycle class groups and those students taking the established Leaving Certificate have five periods of Mathematics per week; Transition Year (TY) classes have three periods, and Leaving Certificate Applied (LCA) classes have four periods per week. The subject is offered at higher, ordinary and foundations levels, as appropriate. A number of teachers offer additional lessons in Mathematics outside scheduled class time. This is evidence of a strong commitment to the subject and to the students. Lessons in all years are well spread throughout the week, facilitating daily progress in Mathematics, and the positioning of lessons is appropriately balanced between mornings and afternoons.

Classes in the school are streamed and concurrent timetabling of higher-ability classes within year groups was introduced in the last school year. Higher-ability classes, in year groups that have more than one class, are concurrently timetabled, or set, for all mathematics lessons. This supports the formation of single-level classes and the movement of students between these classes. It is recommended that the opportunities provided by concurrent timetabling be more fully utilised by teachers leading to a reduction in dual-level classes throughout the school. Furthermore, the addition of an extra teacher to each set would support an increase in students' uptake of Mathematics at higher level. School management should fully explore this possibility.

School management, in consultation with the teaching team, assigns the levels at which teachers teach Mathematics. Continuity is normally maintained through the junior cycle and through the senior cycle. There is rotation of levels and programmes between mathematics teachers, appropriately providing teachers with opportunities and challenges to extend their professional competence.

Most members of the current mathematics team are specialists in subjects other than Mathematics. It is acknowledged, however, that three of the teachers have expressed a commitment to pursue further study in Mathematics in the current and forthcoming school years.

Management should take cognisance of the need for qualified teachers of the subject when recruiting and deploying staff.

There is a comprehensive system in place in the school to identify students requiring additional support in Mathematics. This includes an analysis of performance in the school's entrance assessments and information gathered from feeder primary schools and from parents. In addition, individual teachers can refer students about whom they have concerns to the learning-support department. Support is provided through the formation of smaller classes, particularly at junior cycle, and through in-class support teaching. All supports are provided by members of the mathematics team or the school's resource team. Consideration should be given to using the information gathered from assessment tests to plan the programme for first-year students. For example, identified deficiencies in key skills could be addressed prior to introducing unfamiliar material.

Requests for the purchase of resources to support the teaching and learning of Mathematics are made to school management by the subject co-ordinator or by any individual teacher. A range of materials is available in the school and centrally stored, making the resources accessible to all members of the team. At the beginning of the current school year, a dedicated mathematics room was provided in the school. This room is equipped with a computer, internet connection, an interactive whiteboard and a storage press and is a valuable addition to the mathematics department.

Continuing professional development (CPD) for teachers is supported and facilitated by the school and all members of the mathematics team are participating in Project Maths in-service currently being offered. It is recommended that membership of the Irish Mathematics Teachers' Association (IMTA) be taken out so that teachers can keep up-to-date with issues in mathematics education.

Co-curricular activities raise the profile of the subject within the school and provide students with valuable opportunities to experience Mathematics outside the classroom setting. Co-curricular mathematics activities promoted in Coláiste Dhúlaigh include the celebration of Maths Week, when students are encouraged to enjoy mathematics puzzles and quizzes. Consideration should be given to having first-year mathematics students participate in the Junior Mathematics competition organised by the IMTA. The highest performing student could receive a school award, perhaps as part of the school awards presentations. The school also runs mathematics initiatives such as SRA math laboratory involving parents and first-year students and paired maths involving TY students and first-year students.

PLANNING AND PREPARATION

The subject department structure is well established in the school and the co-ordinator role includes chairing department meetings, co-ordinating the preparation of schemes of work, arranging attendance at CPD, liaising with school management and meeting with teachers new to the department. The position is undertaken on a voluntary basis following an annual nomination process. This rotation strategy allows the department to benefit from the different strengths of each of its members. However, consideration should be given to extending the term of office to two years, allowing a year's familiarisation period.

Formal meetings of the full mathematics team are facilitated by school management three times during the school year. In line with good practice, minutes of these meetings are recorded and maintained with the department plan. Minutes of meetings since the 2004/2005 school year were

available, providing evidence of collaboration and discussion on areas including class-group formation, schemes of work and planning for students with special educational needs. Informal meetings of smaller groups of teachers take place as required, often outside scheduled class time. Significant effort has been invested by the mathematics team in developing a subject plan that follows published guidelines. Notable additions to this template are the inclusion of an information and communications technology (ICT) plan for the mathematics department and a correspondence folder. Project Maths documentation features strongly in the subject plan, including a letter to parents informing them of the introduction of this syllabus initiative and its implications for the ways in which their children will learn Mathematics. The plan also contains lists of the wide range of resources to support the teaching and learning of Mathematics that are available in the SEN department and in the Junior Certificate School Programme (JCSP) demonstration library. It would be appropriate to include a list of all resources available within the wider mathematics department.

Schemes of work, with indicative timeframes, have been documented for all year groups and levels. It is recommended that, in keeping with the approach adopted in Project Maths syllabuses, these schemes would be presented in terms of students' learning outcomes. Their value as a teaching resource would be further heightened with the identification and documentation of specific, tried and tested, active learning methodologies appropriate to particular syllabus areas. Schemes of work for TY varied according to level and teacher. Some are heavily focused on traditional Junior Certificate and Leaving Certificate content, which is not in keeping with the ethos of the transition year. These schemes should be reviewed and amended to provide a programme of work for TY students that allows them experience Mathematics differently, and focuses on student participation.

Most teachers made individual planning and preparation materials available during the inspection. These included attendance and assessment records, personalised schemes of work, student worksheets and teacher notes, and were indicative of thorough preparation and planning by many teachers.

TEACHING AND LEARNING

Eight lessons were observed over two days providing a sample from each year group and each programme in the school. In all lessons, teachers were prepared for class and in many cases this preparation included the sourcing and acquisition of relevant resources. Content was, in all cases, appropriate to year group and level. Most teachers followed the good practice of explicitly sharing the lessons' objectives with students. In one notable instance, the achievement of the objectives was also checked at the end of the lesson.

The pace of lessons was not always appropriate to students' levels. Students were not always sufficiently challenged and their knowledge or skills were not always progressed during lessons. It was clear that teachers' expectations of the capacity of students to achieve need to be raised.

Many classrooms were enhanced with mathematics posters and displays, creating a stimulating learning environment for students. Classroom management was appropriate and effective in all lessons. A mutually respectful relationship between teachers and students was evident. Student-teacher relations were observed to be positive and their importance to classroom business was clear. Students engaged in the work at hand and teachers were affirming and supportive of students' efforts.

The development of students' mathematical communication skills would benefit from an increased focus. Students should be encouraged to use correct mathematics terminology and to give full and accurate answers. In addition, greater use should be made by teachers of probing questions, extending students' understanding and leading them to the solutions to problems. Good efforts were made to relate the content of lessons to students' own experiences. A range of resources including a plastic hoop, real foodstuffs and a pizza fraction set contributed to the success of these efforts. There was also a very good example of a cross-curricular lesson that incorporated elements of Science and Home Economics into Mathematics.

ASSESSMENT

First-year, second-year, TY and fifth-year classes have formal examinations at the end of the Christmas and summer terms, following which written reports are issued. Currently, the "mock" examinations that take place early in the second term are the only formal examinations for third-year and sixth-year classes. Consideration might be given to introducing a second assessment point, mid-way through the first term, for these year groups.

During lesson visits, samples of students' work were reviewed. This work, contained in copy books and in folders, was relevant to programme and syllabus. In addition, it was often well-presented and monitored by teachers. There were some very good examples of teachers providing positive written affirmation and comments on students' written work, in line with the principles of assessment for learning.

There is currently no formal compilation and analysis by the mathematics department of data on students' achievement levels in the certificate examinations. It is recommended that the mathematics team collate and analyse such data and, in line with DEIS planning guidelines, use them as a baseline to measure progress.

The mathematics department has agreed a homework policy that, appropriately, has its roots in the school's homework policy. However, its implementation was not observed during lesson visits. This requires attention by all members of the team.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- A number of teachers offer additional lessons in Mathematics outside scheduled class time, providing evidence of a strong commitment to the subject and to the students.
- Three members of the mathematics team intend to pursue further study in Mathematics in the current and forthcoming school years.
- The dedicated mathematics room, equipped with a computer, internet connection, an interactive whiteboard and a storage press is a valuable addition to the mathematics department.
- The mathematics department offer co-curricular mathematics activities such as Maths Week quizzes and puzzles as well as mathematics initiatives, including paired maths.
- The school has kept parents informed about the introduction of the Project Maths syllabus initiative and its implications for the ways in which their children will learn Mathematics.
- Many classrooms were enhanced with mathematics posters and displays, creating a stimulating learning environment for students. In addition, a mutually respectful relationship between teachers and students was evident.

- There were some very good examples of teachers providing positive written affirmation and comments on students' written work, in line with the principles of assessment for learning.

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

- The opportunities provided by the concurrent timetabling of mathematics classes should be more fully utilised, leading to a reduction in dual-level classes throughout the school.
- School management should fully explore the possibility of allocating additional teacher resources to Mathematics as a means of supporting an increase in uptake at higher level.
- Teachers' expectations of the capacity of students to achieve need to be raised.
- Students should be encouraged to use correct mathematics terminology and to give full and accurate answers to questions posed.
- Greater use should be made, in the classroom, of probing questions, extending students' understanding and leading them to the solutions to problems.

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