

**An Roinn Oideachais agus Scileanna**

**Department of Education and Skills**

**Subject Inspection of Mathematics  
REPORT**

**Pobalscoil Rosmini  
Drumcondra, Dublin 9  
Roll number: 91344V**

**Date of inspection: 20 January 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**

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## **SUBJECT INSPECTION REPORT**

This report has been written following a subject inspection in Pobalscoil Rosmini, Dublin 9 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 and teachers, examined students' work, and had discussions with individual 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, deputy principal and the teachers.

## **SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT**

The time allocation to Mathematics in Pobalscoil Rosmini is good, ranging from five periods per week at junior cycle to six periods per week in the final year of senior cycle. The Transition Year (TY) and Leaving Certificate Applied programmes have four periods and seven periods per week, respectively. The fact that class periods are scheduled to occur on different days of the week is highly appropriate and is an indication that school management understands the nature of the subject and the fact that students require time to assimilate new ideas and skills. However, the timing of lessons that sees, for example, third-year students taking all mathematics classes in the afternoons – three of them during the last period in the day – does not provide optimal opportunities for learning. It is recommended that, in future, prior to finalisation, the school timetable should be checked to ensure a balanced distribution of mathematics lessons across the school day for all class groups.

Mathematics is concurrently timetabled in third year, fourth year (TY), fifth year and sixth year, making it possible for students to study the subject at the level most suited to their abilities and interests, and allowing their movement between levels during the course of their studies. Normally second-year classes are included in this formation and it is intended they will continue to be in the future. It is recognised that this structure poses a significant challenge for the timetabling process in any school and its undertaking reaffirms the importance given to the subject by the school.

Teachers are allocated to class groups by school management and normally continuity is maintained within programmes. Levels are loosely rotated among teachers, with such decisions being made by the mathematics teaching team. Currently three teachers rotate the higher-level Leaving Certificate course, indicating a strong commitment to the subject and a high level of expertise within the team.

First-year students, on entry to the school, are assigned to classes on a mixed-ability basis allowing them appropriate time to settle into the school and display their aptitudes prior to any decisions being made regarding their level of study. Following common Christmas and summer term examinations in Mathematics, and taking into account students' choices and teachers'

recommendations, classes at higher and ordinary levels are normally formed at the beginning of second year. However, currently the second and third years contain classes in which there is a mixture of levels. Any changes that could be made to these class groups to address this, even at this stage in the year, would likely be of significant benefit to all students involved.

In line with good practice, students are encouraged to study the subject at the highest level possible for as long as possible. The additional teacher resources allocated to Mathematics in a number of year groups and at all ability levels support this practice and are commended.

Students in need of numeracy supports are appropriately identified through psychological reports, standardised tests administered as part of the school's incoming assessment process and through the observations of teachers in mathematics classes. The needs of identified students are then addressed through the formation of small groups for Mathematics or through individual or small group withdrawal. Students following the Junior Certificate School Programme (JCSP) study Mathematics at foundation level in separate, stand-alone, classes. As an innovative way of increasing the numeracy levels of these students, the school operates a 'Maths Buddy' system, whereby first-year JCSP students are paired with TY students for student-to-student support.

Commendably, a number of teachers offer additional tuition to students on a voluntary basis. The dedication of the teachers involved and of the students who attend these lessons is applauded.

Teachers are facilitated in engaging in continuing professional development (CPD), and have attended in-service courses offered by the Project Maths Support Service and the Irish Mathematics Teachers' Association (IMTA). Some teachers have also participated in CPD activities taking place outside school time, an indication of a strong commitment to their subject and their students. A number of mathematics teachers in the school hold membership of the IMTA and keep informed of issues and changes occurring at this very important time in mathematics education.

Co-curricular mathematics activities, including the celebration of World Maths Day, are promoted and supported by members of the teaching team. Students have participated in the first-year mathematics quiz organised by the IMTA and in the Prism competition. In addition, a school award has recently been introduced to recognise outstanding achievement in Mathematics. As a further promotion of Mathematics within the school, consideration should be given to contributing to a mathematics-based project in the annual Young Scientist and Technology Exhibition ([www.esatys.com](http://www.esatys.com)).

## **PLANNING AND PREPARATION**

The most senior mathematics teacher has acted as co-ordinator for the mathematics department since 2005. The role description focuses on calling and chairing meetings and disseminating information among the members of the team. It is recommended that the role description now be reviewed, documented and that it include a term of office after which the holder of the role will rotate.

Membership of the mathematics department, which currently stands at eight teachers, tends to be less constant than might be desired. Reasons for this are not wholly within the control of school management. However, priority should be given to establishing and maintaining a stable mathematics team, thus facilitating the strengthening of collegial and collaborative practices to the ultimate benefit of the students.

Meetings of the team take place both formally and informally. A formal meeting is normally scheduled annually, although recently a second has taken place in preparation for the inspection. With the introduction of Project Maths in all schools from September 2010, efforts should be made to hold formal meetings once each term, providing a structure for increased sharing of ideas and experience among teachers. Minutes of formal meetings made available during the inspection indicate team discussion on class organisation, co-curricular activities and timetabling.

A plan for the mathematics department has been developed that includes policies and procedures, information on teachers' professional development activities and data on uptake rates in certificate examinations for the past two years. A notable aspect of the plan is the inclusion of a short report on the school's participation in World Maths Day, as well as details of recent participation in the PRISM competition. In line with good practice, aspects of the plan are reviewed each year at the scheduled formal meeting.

Long term programmes of work for Junior Certificate, Leaving Certificate and Transition Year courses, mainly in the form of textbook chapters to be completed, are incorporated in the department plan. Individual teachers have expanded on these to include greater levels of detail and more precise timeframes for completion. Some, appropriately, make reference to assessment type and frequency. It is recommended that the programmes of work prepared for the department plan be expanded in this way, ready for implementation by all mathematics teachers. It would be timely, also, for the first-year programme to incorporate the common introductory course for junior cycle mathematics developed as part of the Project Maths process. The TY plan, in keeping with the ethos of the programme, includes activities not normally experienced by students in their study of the subject at junior or senior cycle.

There is a range of resources available in the school to support the teaching and learning of Mathematics, including a mobile computer and data projector, demonstration geometry sets, mathematics-specific software, games and shapes and assistive technology for students with a visual impairment. Teachers would be facilitated in increasing their use of digital technology if a dedicated mathematics room could be assigned and a fixed data projector, computer and internet access made available to the department. Currently, requests for additional resources go to school management from individual teachers. It is recommended that, in future, orders for mathematics resources should be agreed by the team and channelled through the co-ordinator. Clearly, a space to which all mathematics teachers would have easy access needs to be made available for the storage of such materials and equipment. Finally, a list of all resources available to aid the teaching and learning of Mathematics should be drawn up and circulated to all members of the team.

Individual teachers' preparation materials made available during the inspection included attendance and assessment records, student worksheets, lesson plans, lesson summaries and teacher notes. Some of the teachers concerned are commended on their high levels of preparation for class.

## **TEACHING AND LEARNING**

In all seven classes visited during the inspection, lesson content was appropriate and teachers were prepared for their teaching. Classroom management, as observed, was almost always appropriate and effective and, in almost all cases, there was mutual respect observed between

teachers and students. It is recommended that, where necessary, measures should be taken to ensure student-student and student-teacher respect is demonstrated at all times.

Students engaged with the work of the class and showed an eagerness to make progress. In order to take best advantage of this, it is recommended that teachers make it their policy and practice to explicitly state the learning outcome at the beginning of each lesson. Such a statement can increase motivation and bring a clearer focus to students' work.

There was appropriate use of mathematical terminology and notation by teachers and some instances where this was also the case for students. Generally, however, teachers need to encourage greater use of the correct mathematical terms and expressions in students' contributions. Simple ways of achieving this are asking students to accurately explain their workings to questions, to suggest next steps in solutions presented on the board or to identify the nature of errors made in written work.

Lessons observed were predominantly structured around the teacher presenting work at the board followed by the assigning of exercises for student practice. While recognising the usefulness of this traditional approach to mathematics teaching, it is recommended that teachers explore ways in which to include alternative student activities into class time. Project Maths in-service currently being attended by all teachers should assist in the development of new skills and increase confidence in this area.

Interaction between teachers and students most often took the form of brief answers to questions posed by the teacher on finding the next steps in the solution to a problem or computing a calculation. There were, however, in line with good practice, some cases of teachers using questioning to challenge students' thinking and extend their understanding of mathematical ideas. This can help students to consolidate their learning, maintain engagement with the topic and foster a problem-solving approach. It is recommended, therefore, that all teachers increase their use of probing questions, appropriately testing students and supporting them in developing the skills of mathematical thinking and communication.

Teachers demonstrated appropriately high expectations of students' capabilities and students responded accordingly, underlining clearly the importance of teachers setting high standards. Lesson content was often linked to students' real life experiences, commendably increasing the relevance of the subject matter. Teachers should continue to identify appropriate links between class work and everyday life and to avail of every opportunity to exploit these links in class.

In all lessons observed, teachers were affirming of students' efforts and the classroom atmosphere was largely positive. Students were comfortable answering teachers' questions and putting forward their own questions, providing evidence of a supportive learning environment. In addition, teachers provided high levels of support in class for individual students. There was one notable example of the accommodation of students' different ability levels through the assignment of separate homework to each class member.

## **ASSESSMENT**

The good practice of administering common end-of-term examination papers is in place in the first and fifth years. This supports students, their parents and teachers in making decisions regarding the level at which to study Mathematics. Assessment procedures are documented in the

department plan. However, common practice to be followed by all teachers, in particular in relation to class tests, has not yet become embedded. It is recommended that the documented policy of ongoing and regular testing be implemented.

Students' progress is assessed through oral questioning in class, the marking of homework, chapter or topic tests and term examinations. A review of a random sample of students' copy books indicated work that was relevant to programme and syllabus and, in a number of cases, clearly monitored by teachers. There were noteworthy examples of teachers providing written feedback for students, in line with the principles of assessment for learning (AfL). All members of the mathematics team are encouraged to investigate further AfL strategies with a view to including them in their classroom practices.

Formal examinations are held at the end of Christmas and summer terms for most students and mock examinations are held for third and sixth years in early spring. Written progress reports are issued to parents following these assessment points. Progress is also communicated to parents once per year at parent-teacher meetings, through individual student journals and, in some cases, by text message.

The subject department is aware of the school's standing with regard to uptake rates and performance in the certificate examinations. It is recommended that full use is made of all available data to gain as complete a picture as possible and contribute to identifying strengths and areas for improvement in the teaching and learning of Mathematics in Pobalscoil Rosmini.

## **SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- The time allocation, scheduling on separate days of the week, concurrent timetabling from third to sixth year and the allocation of additional teacher resources to Mathematics are in line with good practice and subject guidelines.
- The school operates a 'Maths Buddy' system, which sees first-year JCSP students paired with TY students for student-to-student support.
- A number of teachers offer additional tuition to students on a voluntary basis, showing commendable dedication and commitment.
- Co-curricular mathematics activities are promoted and supported by members of the teaching team. In addition, a school award has recently been introduced to recognise outstanding achievement in Mathematics.
- Notable aspects of the mathematics plan are its annual review and the inclusion of a report on the school's participation in World Maths Day. The TY plan, in keeping with the ethos of the programme, includes activities not normally experienced by students in their study of the subject at junior or senior cycle.
- In all classes visited, students engaged with the work of the class and showed an eagerness to make progress.
- There were examples of teachers using questioning to challenge students' thinking and extend their understanding of mathematical ideas. In addition, lesson content was often linked to students' real life experiences, commendably increasing the relevance of the subject matter.
- In all lessons observed, teachers were affirming of students' efforts and the classroom atmosphere was largely positive.

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

- The times at which mathematics lessons occur should be spread across the school day for all class groups. In particular, a disproportionate number of afternoon lessons should be avoided for any class group.
- It is recommended that the role description of department co-ordinator be reviewed, documented and that it includes a term of office after which another teacher will take on the role.
- Efforts should be made to hold formal meetings of the mathematics department once each term, providing a structure for increased sharing of ideas and experience among teachers.
- A list should be drawn up of all resources available for use in mathematics classrooms. A dedicated mathematics room with fixed data projector, computer and internet access would greatly facilitate teachers in increasing their use of digital technology.
- Teachers should explicitly state the learning outcome at the beginning of each lesson, thus helping to motivate students and bring a clearer focus to their work.
- It is recommended that teachers explore ways in which alternative student activities can be included into class time.

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