Subject Inspection of Mathematics
REPORT

Scoil Mhuire
Trim, County Meath
Roll number: 64450R

Date of inspection: 8 February 2011
REPORT ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT
This report has been written following a subject inspection in Scoil Mhuire. 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. 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
Provision made for Mathematics within the school is good. The time allocated is in line with syllabus guidelines; there are five periods per week at junior cycle, Transition Year (TY), fifth and sixth years, and three periods per week of Mathematical Applications for the Leaving Certificate Applied (LCA) class. Lessons in all years are well spread throughout the week, facilitating daily progress in Mathematics, and the positioning of lessons is, in almost all instances, appropriately balanced between mornings and afternoons.

From second to sixth years, all classes are concurrently timetabled within year groups. This appropriately supports the formation of groupings of different levels and the movement of students between levels in the course of their studies. Classes within levels are mixed, containing students of a range of abilities for both higher and ordinary levels. Additional teachers have been allocated to four of the six year groups to allow the formation of smaller class groups, providing evidence of a strong commitment to the subject within the school.

First-year classes are taught as mixed-ability groups, suitably allowing students settle into their new environment and follow a common programme of work prior to decisions being taken regarding their level of study. From second year, division into higher and ordinary levels takes place, based on students’ performance in tests and examinations through first year. Flexibility remains, however, for students to change level because of the school’s concurrent timetabling strategy.

School management, in consultation with the teaching team, decides on the levels at which teachers teach Mathematics. Continuity is maintained from second year to third year and from fifth year to sixth year. There is rotation of levels between mathematics teachers and three members of the team normally rotate the Leaving Certificate higher-level course.
There is an appropriately sized team of six teachers currently teaching Mathematics in the school, each teaching two or more class groups. However, a small number of members of the team are specialists in subjects other than Mathematics. School management is addressing this issue, as far as possible within existing constraints.

There is an effective system in place in the school to identify students requiring additional support in Mathematics. This includes information provided by parents, an analysis of performance in the school’s incoming assessments and information gathered through contacts with feeder primary schools. In addition, subject teachers or year heads can refer students about whom they have concerns to the learning-support department. Support is provided to individuals or small groups of students on a withdrawal basis, with the form of support tailored to assessed needs. It is good practice that, in recent years, all supports are provided by members of the mathematics team.

Requests for the purchase of resources are largely channelled through the subject co-ordinator to school management, which is committed to supporting teaching and learning in every way possible. A range of materials including clinometers, probability kits, playing cards and trundle wheels has been acquired and is accessible to all members of the team. In addition, classrooms have recently been upgraded with desktop computers and digital projectors, and two laptops have been provided at the request of two members of the mathematics team.

Teachers are encouraged and facilitated in engaging in continuing professional development (CPD) and all members of the mathematics team are participating in Project Maths in-service currently being offered. It was reported that two teachers hold membership of the Irish Mathematics Teachers’ Association (IMTA) and, through this professional organisation, keep up-to-date with issues in mathematics education. In addition, some members of the team have participated in CPD activities outside school hours, indicative of a strong commitment to the subject and to their students. The school’s board of management supports teachers’ further study through partial funding and covers the cost of membership of professional associations.

Opportunities to participate in training sessions for the Irish Mathematics Olympiad and the BT Young Scientist and Technology Exhibition are offered to students at Scoil Mhuire. Consideration should now be given to extending the range of co-curricular mathematics activities offered, to include, for example, participation in the Junior Mathematics competition and the Team Maths competition organised by the IMTA, contributing to Problem Solving for Irish Second-level Mathematicians (PRISM) organised by NUI Galway, or celebrating World Maths Day or Maths Week. The cumulative effect of all these activities would further raise the profile of the subject within the school and provide students with additional valuable opportunities to experience Mathematics outside the classroom setting.

**PLANNING AND PREPARATION**

The school operates an established subject department structure and the role of co-ordinator, which includes chairing department meetings, disseminating information and ordering resources, is undertaken on a voluntary basis. The role is rotated periodically, allowing the department to benefit from the different strengths of each of its members, in line with good practice.

Formal meetings of the mathematics team are facilitated by school management and take place approximately once each term. Informal discussions take place as required, often outside
scheduled class time. In line with good practice, minutes of meetings are recorded. It would be appropriate to maintain these with the department plan. Minutes of meetings since August 2009 that were made available during the inspection reveal evidence of collaboration and discussion on areas including class-group formation, progress through schemes of work and the contribution of the mathematics department to the school’s open night.

To build on this good work, it is strongly recommended that the team put in place a series of planning meetings to support each other during the introduction of Project Maths. These meetings would focus on ways in which to introduce topics, the sharing of information on the real-life applications of skills and concepts, the use of concrete materials as an aid to understanding, and on experiential learning methodologies. A suggested starting point for this process is the teaching and learning plans developed for Project Maths; each team member could teach one of the documented lessons and report back to the group as a whole, thus increasing the confidence and competence of all.

The subject plan includes subject organisation details, the school’s assessment policy, a sample subject/level change form, and a description of supports in place for students who find the subject particularly difficult. A notable inclusion is the annual curriculum review form on which the subject team has requested of school management an additional class period for Leaving Certificate higher level. Significant work has been committed to the development of long-term schemes of work that cover each year group and level. While elements of the subject plan could be improved upon, this should be a secondary focus for the moment.

Planning for TY mathematics is based predominantly on the Leaving Certificate programme. In line with the ethos of TY, it should provide different experiences of Mathematics for students, with a particular focus on their active participation.

All teachers made individual planning and preparation materials available during the inspection. These included attendance and assessment records, daily records of work covered in class and assigned for homework, student test papers and work sheets, internet downloads and authentic documents. This was indicative of thorough preparation and organisation by many teachers.

**Teaching and Learning**

Eight lessons covering all year groups and all programmes in the school were observed over two days. The quality of learning and teaching in a majority of these lessons was good. Content was appropriate to year group and level and all teachers had prepared for class. A small number of teachers followed the good practice of explicitly sharing the lessons’ objectives with students. This should become normal practice in all mathematics lessons as a means of maintaining motivation and focus from the outset.

There were some good examples of students being guided to learn through discovery and exploration. A first-year lesson fully embraced the spirit and methodologies of Project Maths and it was clear that both the teacher and the students were enjoying the experience. The collegial sharing of this lesson with other members of the mathematics teaching team, as suggested in section two, would facilitate all first-year students in having a similarly positive experience of the topic. However, the pace of lessons and the expectations teachers had for students’ achievements were not always sufficiently high and in a number of lessons not enough progress was made.
There also needs to be a greater focus on developing students’ understanding of mathematical concepts and less time spent on repeating procedures.

Teaching strategies included the inviting of students to the board and their involvement in a drawing activity. However, lessons were predominantly teacher-focussed. Further efforts, including the wider introduction of Project Maths methodologies, should be made to involve students more actively in their learning.

There was a small number of lessons where good use was made of probing questions, challenging students’ understanding and guiding them to the solutions to problems. The use of such questioning methods by all teachers would deepen students’ mathematical understanding and promote independent learning among students, and is recommended. There were also some good examples of the development of students’ mathematical communication skills through the use of topic-related mathematical terminology.

In all lessons observed, students engaged fully in the work at hand. Teachers had a relaxed rapport with students and mutual respect was clearly in evidence. Classroom management was effective and the learning environment was affirming and very supportive of students’ efforts.

ASSESSMENT

Students’ medium to long-term progress is assessed at two main assessment points each year, following which written reports are issued. Students’ short-term progress is assessed generally through the assigning and marking of class work and homework. A review of a number of students’ copy books in each lesson visited indicated work that was relevant to programme and syllabus and was often very well presented. There was also evidence that teachers were monitoring copy books. In one instance the good practice of commenting on students’ written work, an assessment for learning strategy, was in place.

A common summer examination paper is administered to first-year students in order to support decisions taken on their level of study of Mathematics from second year onwards. Appropriately, it is planned to include the Christmas examination in this practice from 2011.

Data on achievement levels in the certificate examinations are beginning to be analysed in the school and the mathematics team is becoming more aware of strengths, areas for development and its standing as compared with the national picture.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Provision made for Mathematics within the school is good. The time allocated is in line with syllabus guidelines, classes are concurrently timetabled and additional teachers have been allocated in four of the six year groups.
• Additional support in Mathematics is tailored to students’ assessed needs and is provided by members of the mathematics team.
• There is a good range of concrete materials available to the mathematics team and classrooms are equipped with computers and digital projectors.
• A notable inclusion in the subject plan is the annual curriculum review form.
• In a lesson in which the spirit and methodologies of Project Maths were fully embraced, it was clear that both teacher and students were enjoying the experience.
• Mutual respect between teachers and students was clearly observed. Classroom management was effective and the learning environment was affirming and very supportive of students’ efforts.

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

• The mathematics team should put in place a series of planning meetings to support each other during the introduction of Project Maths.
• Planning for TY should be reviewed in line with the underlying principles of the programme.
• Care must be taken to ensure the pace of lessons and the expectations of learning are sufficiently high so that students are making clear progress in class.
• The development of students’ understanding of mathematical concepts should be given a greater focus.
• More use should be made of probing questions, so as to deepen students’ understanding and guide them through tasks.

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.

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