An Roinn Oideachais agus Scileanna
Department of Education and Skills

Subject Inspection of Mathematics
REPORT

Árdscóil Rath Iomgháin
Rathangan, County Kildare
Roll number: 70730J

Date of inspection: 12 May 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Árdscoil Rath Iomgháin. 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 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 principal and subject teachers. The board of management of the school was given an opportunity to comment on the findings and recommendations of the report; the board chose to accept the report without response.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

The time allocated to Mathematics is very good. All junior cycle classes are provided with five periods of Mathematics per week while classes in fifth and sixth year have six. Transition Year (TY) is optional. There are two mixed-ability class groups in TY and they have three periods of Mathematics each week.

The scheduling of mathematics classes is well thought out and designed to support the efficient delivery of the curriculum. The classes are well distributed throughout the week and the balance of provision between morning and evening is most satisfactory. Concurrent timetabling of mathematics classes within each year from second through to sixth year ensures that students wishing to change level can do so with minimum disruption to the rest of their timetable.

First-year mathematics classes are mixed ability and are timetabled independently. Following a series of common assessments, mathematics classes are set at the end of the year. During the inspection, management indicated that the introduction of concurrent timetabling of mathematics classes in first year was being considered. This should be pursued as it would facilitate greater synchronisation in the delivery of the first-year mathematics programme and would allow the classes to be set prior to the end of the year if it were deemed appropriate.

Students transferring from the feeder primary schools benefit from a comprehensive, student-centred, transfer programme. The mathematical capabilities of the incoming students are determined using appropriate standardised tests and the students then follow a common mathematics programme throughout first year. However, the outcomes of the entrance assessment tests have very little influence on the content and delivery of the first-year mathematics programme. In order to address this, it is recommended that, in addition to the standardised tests, incoming students should also sit a test designed to establish their basic mathematics skills set. The first-year programme should then address the weaknesses and exploit the strengths identified by this test and should inform the ongoing formal and informal assessments.

The procedures in place to identify and support students with special educational needs or in need of learning support are very good. Additional support in Mathematics is provided during small-
group withdrawal from subjects other than Mathematics and schemes of work for each individual being withdrawn are developed following consultation with the appropriate class teacher. Frequent retesting ensures that the students’ progress is closely monitored while the measures employed to provide feedback to the students, parents and the relevant class teachers are effective and timely.

The learning-support department and the mathematics department are engaged in an innovative project in which TY students are paired with learning-support students from second year. The numeracy levels of the second-year students are established prior to and following the programme. During the pair work the students do basic arithmetic and learn the rules underpinning the mathematics they encounter during their regular classes. The programme, which also reinforces the TY students’ knowledge and develops their self esteem, is most praiseworthy.

The mathematics department is well resourced. The mathematics teachers have ready access to the school’s extensive information and communication technology (ICT) infrastructure and the majority of the teachers utilise ICT in teaching and learning, in resource development and in administration. In preparation for the national implementation of Project Maths, the department will need to purchase additional resources. In order to rationalise this process, it is recommended that a member of the department be chosen to co-ordinate resource procurement and to act as a Project Maths liaison officer. Clear arrangements for storing and sharing these resources should also be put in place. It is further recommended that a second member of the department be selected to source appropriate ICT resources and to recommend strategies for their integration into teaching and learning and to source appropriate training.

The members of the mathematics department are enthusiastic, innovative and work as an effective team. The qualifications profile of the department is very good and the teachers, with the support of management, have attended a range of continuing professional development courses in recent times. Teachers are assigned to classes by rotation and it is policy that teachers retain the same class group from second into third year and from fifth to sixth year. This is very good practice. Furthermore, each mathematics teacher is assigned to their own room. The teachers have taken full advantage of this by creating attractive media-rich learning environments through the use of posters and other subject-specific paraphernalia.

**Planning and Preparation**

Subject department planning in Mathematics is very well advanced. The activities of the department are jointly co-ordinated and the co-ordinators are appointed by agreement within the department. Regular formal meetings are held, the minutes of which are contained in the subject department planning folder. Valuable planning also takes place during frequent informal meetings.

A very good subject department plan, which reflects and shapes the department’s ongoing activities, is in place. It is evident from the plan that the department is reflective and is open to innovative ideas. For example, the department conducted an analysis of its homework practices and suggestions as to how the standard of homework might be improved are included in the subject department plan. Similarly, a curriculum action plan focussing on improving student attainment in Mathematics and a review of the department’s formal assessment practices, conducted in consultation with the school’s learning-support department, are also detailed in the plan.
The plan also contains the schemes of work for each year and level and while these provide a valuable framework in supporting curriculum delivery, considerable work still needs to be done. The existing schemes primarily consist of chapter lists with an associated delivery schedule. It is recommended, therefore, that the schemes be extended to include intended learning outcomes, and suggested teaching methods. The approaches to be adopted when carrying out key operations and procedures in lessons should be also integrated into the schemes of work.

The subject department plan also details the TY mathematics programme. The curricular material included in the programme is in keeping with best practice. The programme exposes the students to a variety of interesting and unusual Mathematics and enhances their appreciation of its ubiquitous nature. The programme is delivered in a mixed-ability setting and the classes are timetabled concurrently. With this in mind, it is suggested that the existing programme material be configured so that it includes a core and options. The core should address a number of agreed key skills while the options should provide opportunities for inter-class collaborative projects.

The mathematics department analyses student performance in the state examinations annually. The outcomes of the analysis are used to inform department planning. To maximise the benefit accruing from this very good practice, it is advised that the department submit the analysis and their interpretation of it to senior management and to the board of management each year.

**TEACHING AND LEARNING**

It was clear from the outset of the inspection that the members of the department share an enthusiasm for Mathematics and are committed to creating a stimulating and challenging environment for their students. This was evident from the quality of lesson planning, the variety and quality of the resources prepared to enhance teaching and learning, the appropriate pacing of the lessons and the manner in which the teachers engaged with the students.

The lessons were well structured and the transitions between the different phases of the lessons were very well managed. The teachers were knowledgeable and, irrespective of the teaching methods employed, successfully involved all of the students in the lessons. In some instances, time was set aside at the outset of the lessons to agree the intended learning outcomes and a review of the degree to which they were achieved was conducted prior to their conclusion. This very good practice should be universally adopted within the department.

A variety of teaching methods was in evidence. In one case, interactive software sourced from an educational website was used to introduce and investigate angle measure while the relevance of angle measure in everyday life was clearly demonstrated through the use of models. The students engaged in estimation of the size of angles and were expected to use the correct terminology when communicating their findings. The lesson was engaging and stimulating and featured a very good balance between teacher input and student activity. In another case, a more traditional approach was adopted in introducing distance, speed and time. The quality of teacher movement, the positive approach adopted by the teacher and the insightful use of questioning ensured that the lesson was productive and enjoyable and inclusive of all of the students.

Classroom management, student engagement and behaviour were very good. The students were animated during the lessons, they carried out tasks assigned to them with enthusiasm and contributed positively to the lessons by proposing alternative solutions to problems and by asking good questions. All interactions between the teachers and students and between the students themselves were courteous and respectful.
The quality of student learning was very good. The students’ copybooks, their examination scripts and their responses to teacher questioning during the lessons provided ample evidence of the progress being made by the students. Student performance in the state examinations at both Junior Certificate and Leaving Certificate level are also satisfactory. However, consideration should be given to the introduction of initiatives to ensure that the percentage of students taking higher-level Mathematics in the Junior Certificate is maintained through to the Leaving Certificate.

ASSESSMENT

Assessment practices, including the most appropriate vehicles to be used in assessing student progress, form a central part of subject department planning in Mathematics. This ensures that the setting and correcting of examinations is carried out in a consistent manner. Homework is assigned and corrected as an integral part of each lesson. The students’ homework copies are carefully monitored and the quality of feedback provided to students during homework correction is very good.

Class tests are set at the end of each topic. The performance of students in the tests is carefully monitored and recorded. Areas for improvement and common avoidable errors are highlighted when the scripts are being returned to students. This is very good practice.

All classes sit formal examinations at Christmas. Third-year and sixth-year students sit mock examinations early in the second term while the remainder have formal examinations just prior to the summer holidays. Common papers, within levels, are prepared for all formal examinations. This very good practice helps synchronise curriculum delivery and means that the performance of individual students can be easily compared to that of the entire cohort. The quality of the papers produced for the formal examinations is of a very high standard and practices in relation to correcting and providing feedback to students on their performance in the examinations is very good. Learning-support students are provided with student-friendly papers which contain graduated questions designed to engage the students and to increase their confidence. Students in receipt of reasonable accommodation in the state examinations receive similar support in the formal house examinations.

Practices in relation to monitoring student attendance and attainment in class and in formal examinations are very good. Roll call is taken at the beginning of each lesson and the results of class and formal tests, and compliance with homework assignments, are recorded in the teachers’ diaries.

Very good use is made of the student diaries in communicating with parents and class teachers are well supported in this regard by the year heads and senior management. In addition, each year group has one parent-teacher meeting per year.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Timetabling provision for Mathematics is very good and the department collaborates very effectively with management and with the school’s learning-support department.
- The mathematics department is very well resourced. Its members work as an effective team, engage in innovative and reflective practices and share an enthusiasm for Mathematics.
- The quality of teaching and learning is very good and the teachers create a stimulating and challenging environment for the students.
• Assessment practices, including the most appropriate vehicles to be used in assessing student progress, form a central part of subject department planning in Mathematics. This ensures that the setting and correcting of examinations is carried out in a consistent manner.

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

• It is recommended that, in addition to the existing standardised tests, incoming students should also sit a test designed to establish their basic mathematics skills set. The first-year programme should then address the weaknesses and exploit the strengths identified by this test and should inform the ongoing formal and informal assessments.

• It is recommended that a member of the department be chosen to co-ordinate the procurement of the resources required to implement Project Maths and to act as a Project Maths liaison officer. It is further recommended that a second member of the department be selected to source appropriate ICT resources and to recommend strategies for their integration into teaching and learning and to source appropriate training.

• It is recommended that the schemes of work contained in the subject department plan be developed to include intended learning outcomes and suggested teaching methods. The approaches to be adopted when carrying out key operations and procedures in lessons should be also integrated into the schemes of work.

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

Published, November 2010