Subject Inspection of Mathematics
REPORT

Presentation Secondary School
Warrenmount, Dublin 8
Roll number: 60792C

Date of inspection: 16 September 2009
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Presentation Secondary School, Warrenmount. 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 and examined students’ work. The inspector reviewed school planning documentation and some teachers’ written preparation. Following the evaluation visit, the inspector provided oral feedback on the outcomes of the evaluation to the principal. 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

Presentation Secondary School, Warrenmount participates in the Delivering Equality of Opportunity in Schools initiative (DEIS) and provides its 325 female students with the opportunity to access a range of programmes. These include the Junior Certificate (JC), Junior Certificate Schools Programme (JCSP), optional Transition Year (TY), the established Leaving Certificate (LC) and the Leaving Certificate Applied (LCA). The school is one of the pilot schools participating in Project Maths.

The school operates a forty-two class period week for JC students and a forty-three class period week for senior cycle students. All classes are of forty minutes. Time allocated to Mathematics varies but, in general, is satisfactory. JC students have four class periods of Mathematics per week in first and second year and five class periods in third year. JCSP students have four periods of Mathematics in first year and five in both second and third year. Optimal provision for junior cycle Mathematics is one lesson per day. It is therefore recommended that every effort be made to increase the time allocation for all junior cycle Mathematics as the school undertakes a review of its curriculum.

TY students and LCA students have three periods of Mathematics per week. Students studying the established LC have an allocation of five class periods of Mathematics per week. The practice of timetabling Mathematics on a daily basis for year groups who have five class periods of Mathematics per week is commendable and in line with best practice.

Three class groups are formed in first year, two mixed-ability JC classes and one JCSP class. JCSP classes generally remain unchanged. Although offered ordinary level, at the time of the evaluation all JCSP students were following the foundation level syllabus. However, movement from JCSP is facilitated. The school should review its use of the JCSP and ensure that it is not used to define ability but rather to support students to access the curriculum at the most appropriate level. In second year, JC Mathematics classes are concurrently timetabled to allow for the creation of one higher and one ordinary level class group.
Two mixed-ability mathematics groups are formed in TY. One LCA class group is formed in fifth and sixth year. Two class groups for Mathematics are formed in each year of the established LC. Students access a level most appropriate to their ability through the concurrent timetabling of mathematics classes.

The mathematics department comprises six teachers, most of whom are registered to teach the subject. Teachers are, in general, deployed to programmes and levels on a rotation basis. This is good practice as it allows for capacity building within the mathematics department. Management strives to ensure that students have the opportunity to study a level matching their ability. Commendably, an additional teacher has been assigned to teach Mathematics in both third and sixth year. This additional resource has allowed the different levels to be taught separately in these year groups and resulted in the creation of small class groupings.

Support by management in the areas of continuous professional development and mathematics resources offered to the mathematics department is commended. Management facilitates mathematics teachers to attend relevant in-service training. Resources which have been sourced by the mathematics department through the allocation of funding by management include manipulatives, games and samples of PowerPoint presentations. Management has invested in a range of audiovisual and information and communication technology (ICT) to support the subject in the classrooms. Classrooms visited had ceiling-mounted data projectors, PCs and an overhead projector. In addition, teachers of Mathematics have access to laptops and interactive whiteboards.

The school uses an entrance assessment, psychological reports and information gathered from primary schools to identify students in need of numeracy support. The predominant means of numeracy support is through the withdrawal of students for one-to-one or small group support. It is recommended that the modes of provision be expanded to include, for example, in-class support. Furthermore, the development of links between class teachers and support teachers should be strengthened; these could include support teachers’ attendance at mathematics department meetings.

PLANNING AND PREPARATION

Mathematics teachers are facilitated by management to meet at regular intervals throughout the school year. While some documents were not available to the inspector the principal reported it is school policy that minutes of meetings are retained in addition to records of reviews of the department plan.

There is no co-ordinator of Mathematics, although a senior member of the department facilitates the forwarding of relevant notices to colleagues. It is therefore recommended that a member of the department act as co-ordinator to oversee the management and development of Mathematics in the school. The role should support collaborative practice and the involvement of all mathematics teachers in the promotion of the subject. This position should be rotated in order to provide members in the department with the opportunity to share the responsibility associated with the organisation of a department.

The mathematics department plan includes procedural information, and the aims and objectives of the department. In addition, it contains schemes of work for each year group and by individual teachers for their class groups. Commendably, the fifth-year scheme of work has been developed into one document for the teaching of topics with associated timeframes included. It is
recommended that this approach be expanded to all schemes of work so that one succinct scheme is available for a year group. Furthermore, it is recommended that the learning outcomes to be achieved by students at the end of a topic be included with the schemes of work.

The TY Mathematics programme is divided into two half-year modules and delivered by two teachers, each of whom takes responsibility for the teaching of one module. This allows students to experience different teaching styles while allowing teachers to teach their preferred areas. The modules designed give students an opportunity to consolidate JC material, provide some preparatory skills for Project Maths and allow for Mathematics to be studied in real-life situations.

Some individual planning documents were made available during the course of the evaluation. These included details of individual lesson plans and were based on the schemes of work for the subject.

**TEACHING AND LEARNING**

During the evaluation six lessons and a learning support class were observed. This allowed for all programmes and year groups to be observed. In general the teaching was of a good standard, with some variety in methodologies observed to cater for the preferred learning styles of students.

Lessons were presented in a confident and competent manner. In general, time was effectively used and a good pace which allowed sufficient progress to be made was established in lessons. Examples of good practice included the linking of students’ prior learning and the setting of Mathematics in real-life context. In some lessons observed clear learning objectives were established at the outset and allowed students to become engaged in their own learning. At the end of some lessons time was taken to summarise what had been achieved during the lesson. These practices were highly effective and should become a feature in all lessons.

In all lessons observed significant emphasis was placed on the correct use and understanding of key mathematical terminology and symbols. For example, during the teaching of sets students were asked to explain their understanding of terms such as union and intersection, and were required to come to the whiteboard to select these specific sections on a Venn diagram. This is good practice as it reinforces students’ understanding.

Teaching methodologies observed were effective, and varied depending on the topic being studied. Teachers had taken factors such as student ability and preferred learning style into consideration when selecting a suitable methodology for a lesson and this is commendable practice. Methodologies observed included group work, individual work and teacher-directed learning. Careful planning and preparation of group work allowed students to work together, to complete a range of tasks in a lesson about relations. This activity allowed students to learn effectively from each other and provided the opportunity for students to address mistakes and offer suggested solutions to difficulties that arose. Equally effective was the use of discussion at the beginning of a lesson to allow students to recall facts previously engaged with at an earlier stage, during a lesson on geometry.

Teacher questioning generally required students to recall facts. Higher-order questioning that required students to formulate opinions in response to ideas presented was used in some lessons. It is recommended that greater use of higher-order questions become a feature of all lessons. This would provide teachers with an opportunity to challenge students’ understanding and would
require all students to provide justification for the solution to a question. This approach would also support the principles of Project Maths.

Classroom management was good. Frequently, teachers circulated to check students’ progress when a task had been assigned. Many teachers took the opportunity to provide assistance to students who were having difficulties with the task at hand. Lessons were conducted in an environment of mutual respect within which students were given appropriate affirmation for their contributions.

A varied range of resources was used to support the teaching and learning of Mathematics including textbooks, teacher-prepared materials such as work sheets, and games. In particular, very effective use was made of the available ICT equipment at key junctures of a lesson. For example, some teachers used short excerpts from PowerPoint presentations sourced at Project Maths in-service to enhance the teaching of a topic. Other teachers prepared PowerPoint presentations as an aid in the revision of material. However, there was an instance where available resources were not used effectively to ensure that students were focused and on task. For example, the overhead projector or computer and data projector, could be used to record student answers and would allow for greater engagement of all students.

Most teachers are classroom based and in such instances rooms had an array of posters and students’ project work. This is good practice as it provides a stimulating environment for students to work in. The decoration of classroom doors with subject-specific symbols and displays adds to the positive atmosphere within the school.

During interactions with the inspector students demonstrated capabilities in their understanding and usage of terminology. In many instances there was evidence that students were engaged and learning during lessons, particularly where teachers had chosen an active methodology that allowed for a good balance between student and teacher input.

ASSESSMENT

In line with the mathematics department assessment procedures, teachers monitor students’ progress on a regular basis. Teachers used in-class questioning to ascertain students readiness to progress with a topic or establish and address students’ misconceptions. In addition to class tests Christmas examinations take place for all year groups and at summer for first, second and fifth year. Third and sixth year students sit “mock” exams. TY students have continuous assessment and their end-of-year certificate of achievement is determined by an interview based on a portfolio of work. It was reported that common assessment is used where feasible; however, samples of common assessments papers and other assessment papers were not made available during the evaluation.

Communication between the school and home is fostered through the issuing of school reports following formal assessments; in TY monthly reports are also issued. The student school diary is also used by parents and teachers as a means of communication. Parent-teacher meetings are convened for each year group with additional contact with parents on a needs basis.

In all lessons observed teachers assigned homework to students. The work assigned was in line with the topic encountered during the lesson and suitably challenging to allow students to practise work undertaken in class. Students were encouraged to record their homework in their student diaries. Through observation of students’ copies there was evidence that teachers monitored
students’ homework and in some instances provided written feedback to students. In addition, teachers regularly provided oral feedback to students as they circulated the classroom during the lessons. The presentation of students’ work was in general of a high standard and copies were well maintained.

**SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- Management supports teachers through providing appropriate resources and facilitating access to ongoing continuous professional development courses.
- There were very good examples of appropriately chosen methodologies that were engaging of students and suited their preferred learning styles.
- Lessons were conducted in an environment of mutual respect within which students were given appropriate affirmation for their contributions.
- Good links between the school and home have been established.

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

- Every effort should be made to increase the time allocation for all junior cycle Mathematics from four to five class periods.
- A coordinator role for mathematics should be agreed and included in the subject plan. The role should facilitate the department to develop one succinct plan that identifies the learning outcomes appropriate to each year. It should also support collaborative practice and the involvement of all mathematics teachers in the promotion of the subject.
- A greater range of higher-order questions should be included in all lessons.
- All available resources should be used to ensure that students remain on task throughout lessons.

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

Published October 2011