Subject Inspection of Mathematics
REPORT

Ursuline Secondary School
Thurles, County Tipperary
Roll number: 65470F

Date of inspection: 20 October 2010
REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Ursuline Secondary School, Thurles, 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 and examined students’ work. 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 deputy principal.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

In the current year the mathematics teaching team is large with twelve teachers involved in the teaching of the subject. It is recommended that, over time, the number involved in the teaching of Mathematics be reduced, through the development of a core team of mathematics teachers, each of whom is allocated significant contact time with the subject.

Teachers generally continue with classes from first year to third year and from fifth year to sixth year. This is good practice. In some instances, levels are rotated between members of the teaching team. In the junior cycle, teachers rotate fully and this is commended. In order to extend the expertise necessary for teaching higher level Leaving Certificate Mathematics, it is recommended that more teachers become involved at this level. This will enable the school to meet the changing needs of the curriculum in the coming years.

First year classes are taught on a mixed-ability basis. Mathematics classes in each year group from second year on are timetabled concurrently and this is good practice. Concurrent timetabling allows students to follow the highest level possible for as long as possible and facilitates change of level where necessary. In second and third year, students are allocated to higher level classes in three ability bands, based on their performance in common assessments at the end of first year. This method of allocation is currently based on an evaluation of what is perceived to be best for the particular cohort of students and is reviewed annually. However, it is suggested that this be reduced to two bands to allow for the highest possible expectation for the greatest number of students and for the maximum benefit to be achieved from common testing.

Students who find Mathematics challenging are well catered for in the school. They are identified through psychological reports, assessments, contact with local primary schools and parent and teacher monitoring during first year. In addition to withdrawal for small group or one-to-one tuition, support is also provided through the creation of an extra class group in second, third and sixth year. In many instances, this withdrawal is provided by members of the mathematics team and there is close informal contact between the support teacher and the classroom teacher.
Time allocated to Mathematics is good. Lessons are of thirty or thirty-five minutes in duration. All senior cycle classes having six lesson periods each week. Four class periods are allocated to Transition Year (TY) Mathematics. In first year and second year, students have five periods of mathematics tuition each week and the third year groupings are timetabled for six periods each week. Mathematics lessons are distributed evenly throughout the school day and in most instances throughout the school week. However, in the current year, second-year and two first-year groupings do not have mathematics lessons on a Monday. This should be avoided in future timetabling as ideally students should have contact with the subject each day.

The school is committed to the continuing professional development (CPD) of its teaching team. It was apparent that teachers had attended workshops on Project Maths. All teachers had also attended, or were attending, evening courses on content and ICT which have been organised as part of the support for the rollout of Project Maths. This is very positive and reflects well on the commitment of the mathematics teaching team.

The mathematics team does not have an annual budget for resources but requests for materials are favourably considered by management. A variety of teaching resources has been acquired. These are stored centrally and are available to the team. Teachers have access to a computer room and a number of data projectors have been installed in classrooms to support teaching. There was little evidence of the use of information and communication technology (ICT) in the teaching of Mathematics during the evaluation. However, with the availability of suitable equipment and the training recently undertaken by the team it should be expected that ICT will be integrated more effectively into the teaching and learning of mathematics in the near future.

The mathematics department encourages participation in the Team Maths competition and the Irish Junior Mathematics competition organised nationally by the Irish Mathematics Teachers’ Association (IMTA). A range of activities had also been put in place for Maths Week. This is good practice as it raises the profile of the subject within the school and enables students to enjoy and appreciate Mathematics outside of the classroom setting. A dedicated Maths notice-board is also used to highlight mathematics-related activities in the school.

School management and the mathematics team undertake an analysis of the school’s performance in the certificate examinations in Mathematics in relation to achievement and uptake levels comparing performance with national norms. An analysis of results over recent years indicates significant strengths in both these areas. As a substantial cohort of the students taking ordinary level Mathematics at Leaving Certificate is achieving high grades, it is recommended that the school look at ways to encourage more of these students to take higher level.

**PLANNING AND PREPARATION**

The mathematics department is currently co-ordinated, at junior and senior cycle, on a voluntary basis by two members of the team who are selected at the beginning of each year. This practice is positive as is the rotation of the roles of co-ordinators among members of the team.

Whole-school formal planning and review meetings are scheduled around staff meeting and school planning days and occur about four times a year. Records are kept of such meetings and they show evidence of collaboration. Recent discussions have dealt with the harmonisation of approaches to the teaching of procedures and the implications of the introduction of the Project Maths strands from September 2010. Further informal meetings occur regularly during the school year, and it is good to note that records of many of these meetings are also retained. It is
suggested that ICT be used in the keeping of these records to facilitate their distribution and retention.

The mathematics team has made progress in planning. The plan shows evidence of collaboration and review. The department plan includes overall aims and objectives for mathematics teaching within the school, organisational details of classes and teachers, reference to methodologies and resources and cross-curricular planning, which is in line with good practice.

The long-term plan contains a list of topics to be covered by each year group and level annually. It is recommended that the mathematics department continue this good work and further develop the long-term plan for Mathematics. This revised plan should include an outline of sections of the syllabus at junior and senior cycle, learning outcomes to be achieved and key skills for students to acquire under each of these sections.

Mathematics planning for TY is good. This planning is based on modules to be taught to all groups during the year. It is also positive to note that the teachers rotate between the groups during the year.

All teachers made individual planning and preparation materials available during the inspection. Included in these materials were termly schemes of work, examples of worksheets and handouts, common examination questions and solutions. A folder containing a selection of these resources is available to members of the team. This level of co-operation and preparation for teaching is good.

TEACHING AND LEARNING

The teaching and learning observed was of a high standard. In the classes visited, lessons were well structured and purposeful. Preparation for teaching was evident. It was good to note that effort was made to review work previously done and to create connections to new material being presented, thus helping to reinforce learning and to develop new ideas. Instruction began with a clear outline of the lesson content in almost all instances. This is positive. However, this practice could be enhanced if the lesson content was presented as a learning objective for the students and if it was accompanied by the inclusion of strategies for students to evaluate their own learning at the end of the lesson. Adopting this methodology is worthwhile because it sets a short term challenge, increases students’ motivation and involvement in the lesson and leads to a sense of accomplishment on achieving the day’s goal. Lessons progressed at a challenging pace appropriate to student’s abilities. Effective use was made of time. There were good examples of the use of worksheets, pair work and relating learning to the experience of the students.

Teaching observed was generally conducted through the presentation of work at the board followed, by the setting of exercises where individual students practised what they had seen while the teacher provided assistance to students as required. Within this structure, the teaching was effective. However, this teaching style can result in students being generally passive and dependant on the teacher and in them seeing their role as reproducing the method of solution in similar type problems. It is recommended that the team continue to broaden the range of teaching methodologies used. In particular these should include strategies that involve students more and make them more active participants in their own learning. Lessons should include activities such as: pair work; group work; investigation and consolidation activities; use of concrete materials; discussion; quiz activities and greater use of ICT and student project work. The incorporation of these, and other methodologies, into lessons can lead to increased motivation and engage students.
more actively in their own learning. The teaching and learning plans available on the Project Maths Development Teams’ website www.projectmaths.ie should be consulted in this regard.

Teachers made use of both global and directed questioning during the lessons observed. Best practice was observed when some more open and probing questions were included to encourage students to think for themselves. As this type of questioning is so effective in promoting self-directed learning, it is suggested that it be incorporated into lessons more frequently.

Teachers were affirming of the efforts of their students leading to positive interactions within the classroom. This led to a sense of mutual respect between teachers and students, creating an atmosphere that was conducive to learning. Classroom management was effective and discipline was well maintained. Teachers set appropriate high standards of expectation for their students and students responded to these expectations.

In many classrooms, displays of students’ work, number lines and posters were used to enhance the visual-learning environment. The display of such posters and students’ project work can be effectively used to motivate students and remind them of key mathematical concepts or formulae. It is suggested that more use be made of students’ own work, such as projects or examples of high quality work, to highlight the quality of learning and to engage students further.

Learning was evident as students were able to apply procedures, learned in class, to similar type problems from the textbook. They also showed understanding of the concepts taught and displayed clear mathematical knowledge. In interactions with the inspector students used appropriate mathematical terminology. They demonstrated their ability to find solutions to problems, they justified answers to questions posed to them and they made relevant connections between topics.

**ASSESSMENT**

The school has devised clear homework and assessment policies. These are implemented by the mathematics team. This is good. Lessons generally began with the correction of homework and an examination of students’ copies and journals revealed that homework is regularly assigned, which is good practice. Copybooks contained work that was appropriate, relevant and well presented. There was evidence that teachers are monitoring students’ copies and that students also have a role in monitoring their own work which is good. In some instances the good practice of using positive comments to encourage students’ efforts was noted.

Students’ progress is monitored on a regular basis through questioning in class, review of homework and written assessments following the completion of a topic. This is good practice. Parents are required to sign the assessments completed by their daughters. This helps to keep them informed of the progress that is being made. The students’ journal is also used as a means of communication with parents.

All first-year classes are assessed commonly at the end of the school year. Common assessment within levels also occurs in all other year groups. All students are assessed throughout the school year and have formal examinations at the end of the school year or, in the case of examination classes, sit their ‘mock’ examinations during the second term. Teachers retain records of students’ achievements in assessments. Progress is formally reported to parents twice each year. Each year group has a parent-teacher meeting annually. This level of communication with parents is good.
SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Teaching and learning observed was of a high standard.
- Students who find Mathematics challenging are well catered for in the school.
- The time allocated to Mathematics is good.
- The mathematics department encourages participation in co-curricular activities related to Mathematics.
- Teachers had high expectations of the students and the students responded accordingly.
- The school has devised clear homework and assessment policies.
- Students’ progress is monitored on a regular basis.
- The level of communication with parents is good.

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

- The number of teachers involved in the teaching of Mathematics should be reduced to develop a core team of mathematics teachers, each of whom is allocated significant contact time with the subject.
- As a substantial cohort of the students taking ordinary level Mathematics at Leaving Certificate is achieving high grades; it is recommended that the school look at ways to encourage more of these students to take higher level.
- Teachers should broaden the range of teaching methodologies and include strategies that involve students more and make them more active participants in their own learning.

Post-evaluation meetings were held with the principal and deputy principal, at the conclusion of the evaluation when the draft findings and recommendations of the evaluation were presented and discussed.

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