

An Roinn Oideachais agus Eolaíochta

Department of Education and Science

**Subject Inspection of Mathematics
REPORT**

**Midleton College
Midleton, County Cork
Roll number: 62370J**

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**REPORT
ON**

**THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS
SUBJECT INSPECTION REPORT**

This report has been written following a subject inspection in Midleton College. It presents the findings of an evaluation of the quality of teaching and learning in Midleton College 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/subject 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

Time allocated to Mathematics is good. Five class periods are allocated to all junior cycle and Transition Tear classes, and six class periods are allocated to fifth-year and sixth-year classes. It is commendable that mathematics classes are concurrently timetabled for all year groups, thus facilitating students to study Mathematics at an appropriate level. In addition to this provision, all members of the junior cycle teaching team are timetabled to meet for one class period per week. A similar provision is in place for the senior cycle teachers.

The commitment of teacher resources to Mathematics is also highly commended. Three class groupings in first and second year and four in third year, Transition Year (TY), fifth and sixth year allow for the formation of small level-appropriate classes for students and provide the opportunity for significant levels of attention for individual students. Within this structure students are encouraged to follow the highest level possible for as long as possible.

Applied Mathematics is timetabled for a small group of students in fifth year and in sixth year for five periods per week. Another group of students is accommodated outside of timetabled hours under an arrangement with another local school.

Following entry to the school, first-year students' mathematical ability is assessed. Students identified as finding Mathematics particularly challenging are supported by the flexible arrangement of the third concurrent small class group, where some students attend for a time before returning to their original class while others remain for the year. All students are similarly assessed at the end of first year. The format of the test is sometimes modified for a number of students to allow all students to access it in a meaningful way. The small concurrent class structure in other years allows support to be continued as needed.

Management is commended for supporting the continual professional development of teachers by facilitating opportunities to attend in-service in Mathematics during school time. Teachers have attended and plan to attend in-service courses organised by the Mathematics Support Service in a range of topics. Attendance at a leaving certificate applied mathematics course organised by the Cork branch of the Irish Mathematics Teachers Association (IMTA) has resulted in the reintroduction of the subject into the timetable. It is reported that the upcoming leaving certificate higher-level IMTA course will also be attended by members of the mathematics team. All teachers involved are commended. An annual budget is available for Mathematics to cover the cost of purchase of resources and membership of professional associations.

TY is compulsory in Midleton College. Provision for Mathematics in the programme is good. There are four class groups timetabled concurrently, each having five periods per week. Teaching is organised on a modular basis with teachers rotating between the class groups over the course of the year. This allows students to experience a wide range of topics and teaching styles.

PLANNING AND PREPARATION

Whole school development planning is ongoing. Currently members of staff, including the mathematics teachers, are involved in developing the use of Information and Communication Technologies (ICT) in teaching throughout the school. From the beginning of this school year each classroom has been fitted with a ceiling-mounted data projector. Teachers are engaged in raising the level of their own ICT skills and are encouraged to use ICT in their teaching.

Mathematics is jointly and ably co-ordinated by two teachers. Teachers work in a climate of trust and mutual respect, feel valued and are willing to share best practice and learn from one another. Management facilitates four formal Mathematics meetings per year for planning and review. Minutes of meetings document topics discussed and decisions taken. As previously referred to, junior cycle and senior cycle team meetings are timetabled once a week. Other informal meetings take place, on a needs basis, outside of timetabled hours. These meetings have afforded teachers an opportunity to discuss and share best practice and are highly commended. It is clear from the minutes of meetings, the giving of common assessments and the levels of co-ordination, that the mathematics department works collaboratively.

Some impressive examples of individual teacher planning were observed during the visit. All teachers made personal planning materials available for inspection. These included records of student attendance, assessment results, worksheets, mathematical puzzles, lists of useful websites, detailed planned programmes of work, daily diaries of work completed with classes and resources supplied by the Mathematics Support Service. Teachers involved in the teaching of the TY programme had individual detailed notes on the module that they teach to this group.

The mathematics department has collaborated and developed a long-term plan for Mathematics in the school. In its current format the plans for junior and senior cycles are presented as individual documents. The junior cycle plan includes details of the levels within the subject and a yearly programme of study topics at higher and ordinary level. The senior cycle plan contains organisational details of classes, a list of topics to be covered at each level in each year and a list of resources available, including equipment, computer programmes, internet resources, magazines and books. The plan also gives details of where these resources are available within the school. To further develop current planning it is recommended, over time, that the mathematics team review the current planning documentation with a view to drawing together the three programmes taught in the school into a single framework document, possibly along School Development Planning Initiative (SDPI) guidelines. Further directions in which the planning might be developed include: key areas or skills for students to master might be identified and documented within each topic and explicit links could be made between content areas and relevant active methodologies and resources. This would serve to further the sharing of the existing sound professional practice among mathematics colleagues. The publications *Junior Certificate Mathematics Guidelines for Teachers* and *Calculators: Guidelines for Post Primary Schools* could make a significant contribution in this area.

TEACHING AND LEARNING

In lessons observed, content was appropriate, teachers' presentation of work was clear and preparation for teaching was evident. Students were attentive to their work and there were many occasions when enthusiasm for and interest in the subject were apparent. Classroom management was effective and appropriate and students were kept on task. Mutual respect between teachers and students was evident, creating an atmosphere that was conducive to learning.

Topics such as algebra, calculus, and geometry featured in the lessons observed. In general, lessons began with the teacher correcting homework from the previous day and continued with the development of the topics. Teachers used mathematics terminology appropriate to the relevant topics and students' ability. A clear purpose was established at the beginning of lessons. Pace and time management were appropriate to the students' needs and abilities.

There were commendable examples of teachers having high expectations of students and students responding in line with this. Some examples of good practice noted in mathematics teaching included: affirming students' efforts, creating links to other topics, creating links to other subjects, taking measures to ensure the inclusion of all students, the appropriate use of ICT to reinforce a concept being taught and the use of an investigative approach involving student group work. In one particular instance, students were actively engaged in an appropriate activity in the computer room and their enthusiasm and enjoyment was refreshing.

The most common methodology observed was traditional, whole-class teaching. This involved a combination of teacher demonstrations to the entire class and the students then working alone on assigned tasks while the teacher assisted individuals. Less frequently, student-centred learning was observed. It is suggested that the planned integration of ICT into the

teaching and learning of mathematics and the good collaborative practices noted in the school could be exploited to lead to the employment of a greater variety of teaching approaches.

In general, teachers asked lower-order or recall-type questions. In some instances, teachers posed more challenging questions and built on students' answers by encouraging them to explain and justify their thinking and methods. It is therefore recommended that the good practice of using a varied range of questioning strategies be built upon to ensure that there is a balance between lower-order and higher-order questions in all classes.

In interactions with the inspector, students showed a clear understanding of concepts engaged with during the lessons. They demonstrated a wide range of mathematical knowledge, were able to answer questions in a confident manner and justified solutions to questions posed to them.

Teachers are commended for encouraging students to take a level in the state examinations appropriate to their abilities. From an analysis of state examination results it is evident that students' uptake of higher and ordinary levels in both the Junior and Leaving Certificate reflects this level of encouragement.

ASSESSMENT

Students' progress is formally assessed in term examinations and in class tests, which take place at regular intervals.. Teachers are commended for the high level of co-ordination associated with the testing of students. All first-year students complete the same end-of-year test, and term tests within levels in all other year groups are common. Progress is also evaluated by class questioning and by the monitoring of class and homework. Teachers keep records of students' test results and attendance.

The school maintains good communication with the students' parents. Parent-teacher meetings are convened for each year group. Three school reports are issued for each student during the year. Additionally, teachers are available to meet parents if requested to do so.

Progress in work covered in class and in study can be seen in students' copybooks. An examination of a sample of mathematics copybooks showed work that was appropriate, relevant and generally well presented. There was evidence of teacher monitoring of students' copybooks. Each student also keeps a notebook which contains sample work and models of good practice in answering questions in topics covered in class.

To recognise students' success, the school organises a prize-giving day which acknowledges academic achievements and endeavours in each subject. Students are encouraged to participate in a range of extracurricular activities pertaining to Mathematics. These activities include the Team Maths competition, the Junior Maths competition, the Prism competition and attendance at leaving certificate revision seminars in mathematics.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Time allocated to Mathematics is good.
- The commitment of teacher resources to Mathematics is highly commended.
- Students identified as finding Mathematics particularly challenging are supported.
- Students wishing to study Applied Mathematics are catered for.

- Continual professional development of teachers is supported by management.
- Each classroom has been fitted with a ceiling-mounted data projector. Teachers are engaged in raising the level of their own ICT skills and are encouraged to use ICT in their teaching.
- Mathematics is jointly and ably co-ordinated by two teachers. The mathematics team works collaboratively.
- The mathematics department has collaborated and developed a long-term plan for Mathematics in the school.
- Lesson content was appropriate, teachers' presentation of work was clear and preparation for teaching was evident.
- Classroom management was effective and appropriate and students were kept on task. Students were attentive to their work
- A high level of co-ordination associated with the testing of students was evident.
- The school maintains good communication with the students' parents.
- Students are encouraged to participate in a range of extracurricular activities pertaining to Mathematics.

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

- Review the current planning documentation with a view to drawing together the three programmes taught in the school within a single framework document.
- Vary the range of questioning strategies used in classes to ensure that a balance between lower-order and higher-order questions is achieved.

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