An Roinn Oideachais agus Scileanna

Department of Education and Skills

Subject Inspection of Mathematics
REPORT

Hartstown Community School
Clonsilla, Dublin 15
Roll number: 91339F

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AN ROINN OIDEACHAIS AGUS SCILEANNA | DEPARTMENT OF EDUCATION AND SKILLS

REPORT
ON
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Hartstown Community School, 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, 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, one of the deputy principals and some of the mathematics teachers. The board of management was given an opportunity to comment in writing on the findings and recommendations of the report, and the response of the board will be found in the appendix of this report.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

The time allocation to Mathematics in the school is good. In line with syllabus guidelines, all junior cycle classes have five periods in the week, Transition Year (TY) classes have three periods per week and the Leaving Certificate Applied (LCA) year-one class has three periods of Mathematical Applications each week. Fifth and sixth-year classes are allocated six periods each week and the LCA year-two class has four periods of Mathematical Applications. Lessons are generally well spread throughout the week, facilitating for most classes, daily progress in Mathematics and classes have an appropriate mix of morning and afternoon periods.

The school, by virtue of its size, has a relatively complex timetable structure. In addition, consultations and collaboration between school management and the mathematics department have seen changes made to the timetabling arrangements for the subject in recent years. Junior cycle mathematics classes are organised into three bands on the basis of performance in incoming assessment tests. First-year classes are taught mainly as stand-alone groups within their bands and, appropriately, follow a largely common curriculum as students settle into their new environment. From second year onwards, classes are concurrently timetabled within bands so as to facilitate the formation of higher, ordinary and foundation-level groupings. At senior cycle, classes are concurrently timetabled, in fifth year within two bands and in TY and sixth year across the complete year group. This makes for a challenging timetabling process for school management but is indicative of a strong commitment to the subject within the school.

Substantial additional teaching resources have been allocated to first, second, third, fifth and sixth-year mathematics classes so that students can study the subject at the level most suited to their abilities and interests in single-level classes. These very good measures, along with the

changed timetabling arrangements outlined above, should impact positively on students' achievements in Mathematics.

The levels at which teachers teach Mathematics are agreed among the team of subject teachers. Continuity is maintained from second year to third year and from fifth year to sixth year. There is appropriate rotation of levels between mathematics teachers and up to six of the team rotate the Leaving Certificate higher-level course.

There is a large team, nineteen teachers, currently teaching Mathematics in the school. Nine of these teachers have minimal contact with the subject, teaching only one class group. To better support a cohesive sense of team and to build a more solid bank of experience and expertise, it is recommended that the team is reduced in size and the number of teachers having minimal contact with Mathematics is phased out. Also, a number of members of the mathematics team are specialists in subjects other than Mathematics. It is recommended that this deployment practice be reviewed. Teachers wishing to continue to teach Mathematics but who do not hold an appropriate qualification in the subject should undertake a post-graduate course of study.

Students requiring additional support in Mathematics are identified appropriately through the school's incoming assessment process and through information gathered from feeder primary schools by the incoming first-year learning-support co-ordinator. In addition, following the commencement of the school term, individual teachers can refer students about whom they have concerns to the learning-support department. At junior cycle, support is concentrated in the third band where two small groups are formed in consultation with the relevant learning-support year co-ordinator. Consideration should be given to introducing the team-teaching model of support, which could be implemented for the full programme or for particular areas of the curriculum. Other support arrangements include in-class support or, for students with an exemption in Irish, withdrawal. It is good practice that, where possible, all supports are provided by a member of the mathematics team.

Requests for material resources to enhance the teaching and learning of Mathematics are normally discussed among the teachers and channelled through the co-ordinator to school management. Materials including class sets of geometry equipment, calculators and mathematics tables are then stored in assigned mathematics teachers' rooms in different areas of the school, thus facilitating access to them by team members. Each classroom has been recently equipped with a computer and fixed data projector and has high-speed broadband access. It is to be expected that as teachers become accustomed to this high level of information and communications technology (ICT) support, it will be used on a more regular basis as a teaching and learning tool.

Teachers are supported and facilitated in engaging in continuing professional development (CPD) and all members of the mathematics team have participated in Project Maths in-service offered to date. In line with good practice, a number of teachers hold membership of the Irish Mathematics Teachers' Association (IMTA), facilitating their ongoing familiarisation with issues and changes occurring 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 mathematics teachers have established a Maths Club in the school. A member of the team volunteers to attend each week and provides tutorial-type assistance to students who may have missed out on elements of their course, or who may need additional help in grasping a new concept. The teachers involved are congratulated on putting such a structure in place to assist students. Co-curricular mathematics activities are also promoted within the school. These have

included Team Maths, a competition for senior students organised by the IMTA, and the Hamilton Grand Challenge, providing students with an invaluable chance to experience Mathematics outside the classroom.

PLANNING AND PREPARATION

Subject department structures are well established in Hartstown Community School and the co-ordination of the mathematics department forms part of a post of responsibility. The role, as it currently operates, includes chairing meetings of the mathematics team, organising class groups, disseminating information and updating the subject plan. It is recommended that the role is reviewed and a stronger focus on curriculum leadership is highlighted.

Formal meetings of the mathematics team are facilitated by school management once per term. Minutes of the August 2010 department meeting indicate collegial discussion on topics such as programme planning, class organisation and the movement of students between levels. Informal meetings between teachers in the same band or year group take place, as required, outside scheduled class time.

A subject plan, based on the School Development Planning Initiative (SDPI) template, has been collaboratively drawn up. It includes subject aims and objectives, subject organisation details, schedules for course coverage and the department homework policy. Considerable work has gone into documenting long-term programmes of work that have, commendably, been set out in terms of learning outcomes. However, the programmes are predominantly based on the textbooks currently in use. It would be more appropriate to formulate all programmes and their associated learning outcomes on the relevant syllabus, with reference to the textbook at suitable points.

The first-year programme of work should clearly incorporate the common introductory course for junior cycle Mathematics, developed in tandem with Project Maths. This programme and the fifth-year programme also need updating in light of the introduction of strands one and two of the new syllabus.

It is good practice that the mathematics team have collaborated in the development of shared folders of tests, worksheets, examination tips and class quizzes. These are stored in the co-ordinator's classroom and are available to be used by all members of the team.

A small number of teachers made individual planning and preparation materials available during the inspection. These included student tests, worksheets, teacher notes, student handouts, authentic documents, internet downloads and mathematical puzzles and challenges and were indicative of ongoing thorough preparation on the part of those teachers.

Achievement levels in certificate examinations are monitored and are being used to contribute to planning activities. The mathematics team, in co-operation with school management, has identified areas for improvement and is actively putting measures in place to address these.

TEACHING AND LEARNING

There were nine lessons observed over two days by the inspector and, overall, the quality of learning and teaching was good. Teachers were prepared for class and, in each lesson, content was appropriate to year group and level. Good practice was observed by most teachers when they

explicitly shared the lesson objectives with students. As this focuses students' attention and establishes, from the outset, a clear sense of purpose this practice should become established as a normal routine in all mathematics lessons. There were also some examples of the review of the achievement of the objectives at the end of lessons, commendably reinforcing learning and giving a clear signal of progress made.

In line with the approach to the teaching of Mathematics espoused by Project Maths, almost half of lessons observed incorporated a practical activity including the assembly of a cut-out puzzle, the measuring of cardboard shapes and the playing of an algebra game. This variety of student activities enhanced the learning experience by stimulating students' enthusiasm and increasing their enjoyment of lessons.

All lessons observed were purposeful and students were generally making progress. However, care must be taken, particularly in higher-level classes, to ensure the pace and challenge of lessons are sufficiently high. There were some examples of the successful relating of lesson content to students' real life experiences, adding to the relevance of the subject for students and increasing their levels of motivation and understanding. To maximise the benefits of this strategy, efforts should be made by all mathematics teachers to relate lesson content to real life, whenever possible.

Interactions between teachers and students often took the form of brief answers to questions posed on finding the next steps in the solution to a problem. Teachers need to use questioning more as a means of extending students' understanding and encouraging the expression of mathematical ideas, helping students to consolidate their learning and maintain engagement with the topic. Individual differences in students' levels of understanding were usually well attended to by the teacher interacting with individual students, as required.

In almost all lessons observed, students were attentive and engaged fully in their work. Teachers had a relaxed rapport with students and mutual respect was in evidence. Classroom management was almost always effective and teachers were affirming of students' efforts. Students were comfortable answering teachers' questions and putting forward their own questions, providing evidence of a supportive learning environment.

ASSESSMENT

The good practice of administering common end-of-term examination papers, within levels, is in place. There is also some sharing of topic test papers between teachers so that some class tests are also common. The students' journal has a dedicated section for the communication of class test results to parents. This can be very important in allowing progress be monitored and in maintaining motivation and teachers should make full use of it.

Short-term progress is assessed through the assigning and marking of class work and homework. A review of a random sample of students' copy books indicated such work to be relevant to programme and syllabus and, in some cases, clearly monitored by teachers. There were some commendable examples of teachers providing positive written affirmation and comments on students' written work, in line with the principles of assessment for learning. There were other instances where students' standards of presentation and correction of written work were less than might be expected, and closer monitoring by teachers is required. All students should be reminded, on a regular basis, of the importance of presenting and marking their work in a structured and orderly fashion as an aid to achieving their potential in the subject. The correction

of homework in class is clearly an important first step in students marking their work in their copybooks.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- The time allocation to Mathematics, the arrangements for concurrent timetabling and the substantial additional teaching resources allocated to the subject are very good.
- Co-curricular mathematics activities, including a Maths Club are promoted within the school, providing students with an invaluable chance to experience Mathematics outside the classroom.
- A subject plan has been collaboratively drawn up and considerable work has gone into documenting long-term programmes of work set out in terms of learning outcomes. In addition, the mathematics team have collaborated in the development of shared folders of tests, worksheets, examination tips and class quizzes.
- The mathematics team, in co-operation with school management, has identified areas for improvement and is actively putting measures in place to address these.
- During lesson visits, most teachers explicitly shared the lesson objectives with students.
- In line with the approach to the teaching of Mathematics espoused by Project Maths, almost half of lessons observed incorporated a practical activity to enhance the learning experience.
- There were some commendable examples of teachers providing positive written affirmation and comments on students' written work.

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

- The size of the mathematics teaching team should be reduced and the deployment of teachers who are specialists in subjects other than Mathematics should be reviewed.
- Questioning should focus more on extending students' understanding and encouraging the expression of mathematical ideas.
- Care must be taken, particularly in higher-level classes, to ensure the pace and challenge of lessons are sufficiently high.
- The first-year programme of work should clearly incorporate the common introductory course for junior cycle Mathematics. This programme and the fifth-year programme also need updating in light of the introduction of strands one and two of the new syllabus.

A post-evaluation meeting was held with the principal, one of the deputy principals and some of 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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Appendix

SCHOOL RESPONSE TO THE REPORT

Submitted by the Board of Management

Area 1: Observations on the content of the inspection report

The board welcomes the positive findings of the report in relation to subject planning and collaboration. The board acknowledges the commitment of the teaching staff to the Maths Club, which is a popular co-curricular activity.

Area 2: Follow-up actions planned or undertaken since the completion of the inspection activity to implement the findings and recommendations of the inspection

The size of the teaching team has been reduced for the coming year.
The first year programme is being updated to incorporate the common introductory course for first year and the strands of the new syllabus.
The recommendation regarding the pace and challenge in higher level classes is noted. Subject development in the coming year will focus on pacing and on questioning techniques.