

**An Roinn Oideachais agus Eolaíochta
Department of Education and Science**

**Subject Inspection of Mathematics
REPORT**

**St Vincent's Christian Brothers' School
Glasnevin, Dublin 11
Roll number: 60400F**

Date of inspection: 5 November 2009

[Subject inspection report](#)
[Subject provision and whole school support](#)
[Planning and preparation](#)
[Teaching and learning](#)
[Assessment](#)
[Summary of main findings and recommendations](#)
[School response to the report](#)

REPORT ON THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in St Vincent's Christian Brothers' School, Glasnevin. 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 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

There are 333 boys currently enrolled in St Vincent's Christian Brothers' School, Glasnevin. Timetable provision for Mathematics is very good with six class periods allocated to first, second, third, fifth and sixth year class groups. In transition year (TY) Mathematics is timetabled for four class periods per week. Four mathematical applications lessons are provided for Leaving Certificate Applied students for year one and year two of the programme. The school offers the Junior Certificate School Programme (JCSP) and

students availing of this option benefit from one additional mathematics lesson in each of first and second year. Overall the timetabling arrangements for mathematics are good. First, fifth and sixth year mathematics lessons are concurrently timetabled; a valuable arrangement that provides flexibility to change level where necessary.

The school's practice in relation to students' choice of level in Mathematics is good. Incoming first year students are assigned either to one of two mixed ability class groups or the JCSP class group. In early November students are assigned to higher and ordinary levels. This is done on the basis of achievement in common tests although, in keeping with good practice, teacher opinion, parental preference and student preference all play a part in level choice. As first year mathematics lessons are concurrently timetabled further movement between levels is facilitated throughout the year. In second year and in third year there is an ordinary level class, a JCSP class and a class comprising a combination of higher and ordinary level students. Change of level in second and third year is facilitated through the combined class group. There is one TY class group and it is of mixed ability. In fifth year and in sixth year there is a higher level class and an ordinary level class with lessons concurrently timetabled. It is the policy of the mathematics department to encourage students to study the highest level possible for as long as possible.

The mathematics department comprises nine teachers. Teachers are assigned to class groups in accordance with their qualifications and expertise. Levels are rotated amongst most members of the teaching team which is good practice. Teacher continuing professional development is supported by school management. In addition, teachers who have ICT expertise provide training for their colleagues. These good practices help to maintain capacity within the mathematics department and to create a supportive environment where teachers can benefit from the sharing of expertise and experience.

The information and communications technology (ICT) resources in the school are very good. The mathematics department has access to five 'Smartboards'; two that are available on a booking system, two that are situated in science laboratories and one that is available in the learning support room. In addition, the school's two computer rooms can be booked for mathematics lessons. Other resources used in mathematics lessons include geometry sets and rulers, calculators, puzzle books and science equipment. Household bills, brochures, 'Flashmasters', and internet websites are used mainly in LCA and JCSP mathematics lessons. Some teachers use everyday objects such as cardboard cylinders and maps for use in teaching volume and area.

Classrooms are currently student-based; an arrangement that makes it difficult for teachers to use resources in teaching and learning in Mathematics and means that to do so routinely, requires a significant degree of forward planning. If classrooms were teacher-based it would be possible to have materials, resources and ICT facilities to hand so that they could be used to enhance and clarify mathematical explanations on a day-to-day basis as opportunities present themselves. It is therefore recommended that the possibility of adopting this arrangement be considered in future planning.

The procedures for identifying students who require learning support include pre-entry diagnostic testing, communication with feeder primary schools and with parents, ongoing teacher observation and class testing. Early in first year students are retested, this provides the learning support department with a more accurate assessment of individual student requirements. Support is provided through the creation of smaller class groups and individual withdrawal where necessary. Students also benefit from the supports provided as part of the JCSP programme. It is recommended that in-class support and team teaching be considered as additional modes of provision of learning support. This measure would complement the very good work that is currently being done in this area. Teachers provide high quality support to students through the provision of individual attention in class on a day-to-day basis. Overall students who experience difficulty with Mathematics or have been identified as requiring support with Mathematics are very well supported.

PLANNING AND PREPARATION

The mathematics department has recently begun work on the development of a mathematics plan. Meetings are held four times per year as part of the whole-school planning process. A co-ordinator has been appointed to oversee the planning process for Mathematics. Most mathematics teachers have a significant involvement in teaching another subject and are members of other subject departments. It is a good arrangement, therefore, that the timetable on school planning days is split in order to make full attendance at mathematics department meetings possible. The members of the mathematics department work very well together as a team and provide strong support for each other. This is of particular note where, for example, ICT training takes place. In the interest of providing a wider sharing of experience and expertise, it is recommended that a section of planning meetings be given over to discussion about teaching methodologies and classroom practice.

Programmes of work for each year group comprise a list of topics to be covered within defined timeframes. In some cases these are in terms of expected learning outcomes, necessary resources, methodologies and modes of assessment. It is recommended that this good practice be extended to the programmes of work for each year group and level. In order to optimise the value of the planning process to provide a forum for the sharing of lesson ideas, this work should be undertaken in a collaborative way.

Good planning and preparation was evident in most of the lessons observed. In most lessons the methodology used was teacher exposition. It is recommended that the development of the programmes of work be used as a means of increasing the variety of methodologies used in mathematics lessons. Pair work, group work, active methodologies, outdoor activities, research, discovery, and ICT are all very desirable methodologies for teaching and learning in Mathematics and should be included in lesson planning as much as possible.

The planning process should be used to develop policies on areas of importance to teaching and learning in Mathematics. These could include policies on student assignment to levels, timetabling for Mathematics, assessment, homework, appropriate methodologies and provision of learning support. Throughout the evaluation there was much evidence of teachers focusing on teaching for understanding, of students taking responsibility for their own learning and of students providing assistance for each other. The mathematics policies should reflect these positive aspects of classroom practice. Above all, the mathematics plan should accurately reflect the work of the mathematics department, inform classroom practice, should put student needs at the centre of planning and have a very real and positive impact on students' learning experience in the classroom.

The content of the current TY plan describes a programme that is in keeping with the spirit of a very good TY programme for Mathematics. The programme includes the 'buy a house project' where students are provided with a scenario and a budget and engage in the research necessary for choosing a house to purchase and financing it. Through learning to play chess in TY, students are provided with an ideal opportunity to develop the strategic thinking skills that are essential for success in Mathematics. There are plans for a member of the *Bridge Association of Ireland* to visit the school to teach TY students how to play bridge. This experience will be used to support students in their study of probability. In addition TY students study a module of Applied Mathematics. This plan is operating for the current year, however, it is currently in draft form and it is recommended that it be formalised and included with the main mathematics planning documentation.

It is recommended that the mathematics department carries out an annual analysis of the school's performance in the certificate examinations and compares it to the national norms. This analysis should be used to inform planning for Mathematics.

TEACHING AND LEARNING

High quality teaching and learning was evident in six of the seven lessons observed in the evaluation. In most cases teachers made very good use of questioning to assess, involve and engage students and

teacher explanations were clear and conceptual. Through focusing on the strategic elements of mathematical explanations and by expecting students to examine the reasons behind the steps in worked examples, teachers used higher-order strategies to help students to explore difficult concepts. Since this facilitates the development of critical thinking skills further use of higher-order strategies is encouraged. The methodology used in most cases was teacher example followed by student exercise. This was made effective by the good balance between teacher and student input that was achieved and the lively pace of most lessons. While there was some variety in teaching methodology, including ICT observed in the evaluation, this mainly happened in LCA and JCSP lessons. Therefore it is recommended that teachers seek ways to include more variety of methodology in mathematics lessons for all year groups and levels.

In keeping with good practice some lessons opened with a revision of the previous day's lesson which was written on the board. In some cases teachers made links between students' own personal experience and their course material; a practice which helps students to identify with the subject and is therefore very valuable. In response to a question from a student on functions, the teacher provided a good answer by creating links between different areas of the course. This provided a very good way for students to appreciate the interconnections between elements of the course as a whole and was therefore very worthwhile. It is recommended that teachers further this practice by continuing to identify connections and by being conscious of drawing student attention to them.

It is good that the learning intentions were shared with the students at the beginning of most of the lessons observed. However, best practice in this regard occurs when the learning intentions are written explicitly on the board at the start of each lesson and their achievement is checked at the end of the lesson. This approach is recommended since it leads to a sense of achievement and can alert the teacher to material that may need to be revised in the next lesson.

There was much evidence of teachers encouraging students to take responsibility for their own learning. This was achieved by the provision of short examples that contained just enough information to enable students to work out problems for themselves. While providing individual assistance to students or while answering student questions, teachers gave general problem-solving advice, rather than full answers to problems, as an additional means of encouraging students to think for themselves. On solving trigonometric problems, in one lesson, students were asked to refer to the original diagram to see if their answers made sense. These are examples of very good practice and further use of such strategies is encouraged.

One lesson in the computer room was observed. In this lesson LCA students worked on a key assignment as part of the Mathematics for Leisure section of the programme. The students worked individually with teacher assistance where necessary. Through interaction with the students it was evident that very good progress was being made. The students engaged very well with the content of the lesson. The methodology chosen and the realistic nature of the lesson content made this lesson ideal for LCA.

The quality of teaching and learning in one of the lessons observed was poor. The lesson lacked structure and focus from the outset. Teacher instructions and explanations were unclear. The presentation of work on the board was disorganised and, in parts, was incomplete due to a lack of appropriate mathematical notation. The methodology consisted of the teacher asking various students to read questions aloud followed by the teacher completing some, but not all, of the question read out, on the board. Questioning was used to involve some students in the class group. Teacher examples progressed at a pace that was too fast for students to follow. The students disrupted the lesson by engaging in behaviour designed to provoke a reaction. The teacher responded to this disruption in a confrontational manner. This contributed to a class atmosphere that was tense and a learning environment that was insecure. The quality of learning in this lesson was poor and student progress was limited. This was evidenced in the clear sense of student frustration and confusion demonstrated, in the level of student disengagement displayed, in the inability of students to answer questions and in the type of questions asked by students. It is recommended that an explicit statement of the lesson's learning intentions, clearer work on the board, a greater variety of learning activities, a steadier lesson pace, and differentiation of learning activities be included in each lesson as strategies for improving classroom

experience for learners. Furthermore, classroom management practices that are based on mutual respect should be used when dealing with disruptive student behaviour.

In general the relationships between students and their teachers were observed to be very good. Most teachers are affirming and encouraging of student effort. In some cases, where it was appropriate, humour was used to good effect. In almost all of the lessons observed the levels of student engagement and attention were observed to be high. Students generally participated very well in lesson activities. It was evident that most students find Mathematics interesting and enjoyable and are making steady progress with the subject. Teachers generally have high expectations of student achievement and these are reflected in the effort that students make to the work of lessons.

ASSESSMENT

All students, with the exception of LCA students, are formally assessed at Christmas. LCA students are continuously assessed throughout the year. Summer examinations are held for first, second, fifth and transition year students. 'Mock' examinations are held in spring for students preparing for the certificate examinations. Reports are sent home following all formal assessments and parent teacher meetings take place annually.

First year students sit common examinations, at the end of October, on the basis of which students are assigned to higher and ordinary level classes. This is good practice. It is recommended that common examinations, within levels, should be set for students of all other year groups. This measure would support the mathematics department in planning for student assignment to class groups and in monitoring student progress. When setting assessment tests, it is recommended, that teachers differentiate questions to take account of the variety of ability in each group. This should add to the quality of the information resulting from the assessments and also help to ensure that all students have a chance of achieving some degree of success.

Teachers monitor student progress by oral questioning and observation in class. In addition, it is department policy to set class tests at the end of every topic studied. Homework is set regularly and is usually corrected as part of the following lesson. It was evident from the review of student copybooks that the standard of presentation of student work is generally high. Most teachers provide students with valuable feedback by including comments in the correction of tests and homework. Teachers also provide students with verbal feedback following assessments. This is very good practice as these provide students with a very valuable source of advice and encouragement.

SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The following are the main strengths identified in the evaluation:

- Timetabling arrangements for Mathematics are good as is the school's practice in relation to students' choice of level in the subject.
- The information and communications technology (ICT) resources in the school are very good.
- Students who experience difficulty with Mathematics or have been identified as requiring support with Mathematics are very well supported.
- High-quality teaching and learning was evident in six of the seven lessons observed in the evaluation.
- In general the relationships between students and their teachers were observed to be very good.
- Teachers provide students with a very valuable source of advice and encouragement through the correction of class work and tests.

- Teachers generally have high expectations of student achievement and these are reflected in the effort that students make to the work of lessons.

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

- In order to facilitate the use of a wider variety of methodologies in mathematics lessons the possibility of arranging teacher-based classrooms should be considered in future planning.
- The teachers of Mathematics should collaborate in the creation of subject plan that reflects and informs classroom practice and puts the student at the centre of planning for Mathematics.
- Pair work, group work, active methodologies, outdoor activities, research, discovery, and ICT should be included in lesson planning as much as possible.
- To optimise the classroom experience for learners, all lessons should include an explicit statement of the lesson's learning intentions, clear work on the board, a good variety of learning activities, a steady lesson pace, and differentiation of learning activities to cater for the variations in student ability that are present in the class group.
- The transition year plan is currently in draft form and it is recommended that it be formalised and included with the main mathematics planning documentation.
- Common examinations, within levels, should be set for students of all year groups.

Post-evaluation meetings were 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 March 2010

Appendix

SCHOOL RESPONSE TO THE REPORT

Submitted by the Board of Management

Area 1: Observations on the content of the inspection report

The Board of Management and Staff welcome the positive and supportive nature of the report.

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

Since the report was issued we have had a Mathematics Department meeting where consideration was given to all the recommendations, with a view to their implementation, where feasible and within available resources.

Staff changes have been made since the issuing of the report.

