Subject Inspection of Mathematics
REPORT

Saint Mary’s CBS
Borris Road, Portlaoise County Laois
Roll number: 63430G

Date of inspection: 31 January 2011
REPORT  
ON 
THE QUALITY OF LEARNING AND TEACHING IN MATHEMATICS

SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in St. Mary’s CBS. 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; a response was not received from the board.

SUBJECT PROVISION AND WHOLE SCHOOL SUPPORT

Timetabling provision for Mathematics is very good. The time allocated to Mathematics is more than adequate, the distribution of mathematics classes throughout the week is very good and the balance of provision between morning and evening is also very satisfactory.

The mathematical capabilities of students entering first year are established using a variety of standardised tests and while the tests have worked very well in the past they are no longer fit for purpose. It is therefore recommended that a maths competency test be designed by the mathematics department in consultation with the feeder primary schools. The test should establish the strengths and weaknesses in the students’ skills set and should, as a result, inform the design, delivery and assessment of the first-year mathematics programme.

Mathematics classes in first year are mixed-ability and follow a common programme with common assessments until Christmas in second year when setting takes place. The mathematics department, supported by management, actively encourages student to choose higher-level Mathematics at this stage and the concurrent scheduling of Mathematics within each year allows the students to follow higher level for as long as possible. Thanks to these efforts, the number of students taking higher-level Mathematics is steadily increasing. The very good work already in hand would be further enhanced through extending the range of co-curricular activities available to students. These might include the celebration of Maths Week and participation in the various competitions promoted by the Irish Mathematics Teachers’ Association (IMTA). It is also advised that the classes be set at the end of first year rather than at Christmas in second year as is currently the case.

Provision for students with special educational needs or in need of learning support is good. The school’s home-school team, funded by the board of management, maintain very good links with the feeder primary schools and the educational and other needs of this cohort of students are well established prior to their entry to the school. Additional support in Mathematics is provided by subject specialists and is delivered during withdrawal from subjects other than Mathematics and
through the formation of a small class group in each year apart from first and transition year (TY). During the inspection, additional models of learning-support provision, including team teaching, was mooted. The inclusion of team teaching and in-class cooperative support would be very welcome additions to the existing support models and should be rigorously pursued.

The mathematics department is very well resourced. Each classroom is equipped with a data projector and a teacher’s laptop while lessons can also be delivered in a dedicated mathematics room containing subject-specific equipment and in the school’s computer rooms. The mathematics teachers are assigned to their own base rooms. Many have customised the rooms through the use of innovative seating arrangements, posters and other relevant paraphernalia to create learning environments that are both stimulating and functional. This approach, particularly in relation to the seating arrangements, should be universally adopted across the department.

The mathematics department is comprised of eight teachers only one of whom has an appropriate qualification in Mathematics. Given the expected growth in the number of students taking higher-level Mathematics in senior cycle and while acknowledging the level of expertise gained by the teachers over the years, their dedication to the development of the department and to their own professional development, there is a need to enhance the qualifications profile of the department. It is recommended therefore, that in making future appointments to the department, only fully qualified mathematics teachers be considered.

Management is very accommodating in facilitating teacher attendance at continuing professional development courses. All of the mathematics team are members of the IMTA, the school pays the cost of membership and also provides a bursary to support teachers continuing professional development.

**PLANNING AND PREPARATION**

The structures in place to support subject department planning in Mathematics are very good. Regular planning meetings are held and the schedule of departmental meetings together with the agendas and minutes of these meetings are contained in the subject department plan for Mathematics. The department’s various activities are managed with enthusiasm and skill by the subject co-ordinator. The existing co-ordinator has been in place for a number of years and it is recommended that he remain in place at least until Project Maths is fully embedded in the school.

A comprehensive subject department plan for Mathematics has been developed and while it provides a very useful framework to support the department’s activities, it is now in need of review. The review should reflect the recent changes to the curriculum resulting from the introduction of Project Maths and the enhanced facilities now available for teaching and learning Mathematics in the school. Priority should be given to upgrading the existing schemes of work. The schemes that emerge from the review should be written in terms of learning outcomes and should include, in one matrix, agreed procedures for carrying out key mathematical operations, preferred teaching methods, appropriate resources and modes of assessment.

Upon completion of the junior cycle, students have the option of entering TY. There are currently two mixed-ability classes in TY and the mathematics programme being followed is appropriate to the needs of the students and the overall aims of TY. However, the planning documentation supporting the programme is in need of further development. Particular attention should be given
to the existing schemes of work which should be rewritten to model those that emerge from the review mentioned above.

The lessons observed during the inspection were, in almost all cases, very well planned. The material covered was appropriate and was, in most cases, in line with the schedule contained in the subject department plan for Mathematics. Planning for the integration of resources in lesson delivery was also of a high standard and in the vast majority of lessons, information and communication technology (ICT) and other resources were used to great effect to enhance students’ understanding and to create a visually stimulating learning environment.

TEACHING AND LEARNING

The quality of teaching observed during the inspection was very good in the vast majority of cases. In the most effective cases there was a very good balance between teacher input and student activity and a range of approaches was used to engage the students in their own learning and to develop their understanding of the material being covered. Where the teaching was of a lower standard, the textbook was the only resource in evidence and there was an overemphasis on teacher input. Furthermore, the students engaged in mundane repetitive activities which did serve to develop the students’ skills base but did very little to enhance their understanding of the underlying mathematical principles.

ICT was used to very good effect in a number of classes. In one instance, the lesson was delivered in the school’s computer room and the students used dynamic software to explore concepts in geometry. Perceptive interventions by the teacher ensured that the lesson’s objectives remained in focus throughout and that interesting results achieved, or anomalies encountered, by individual students provided opportunities for shared learning. In another case, the ICT enabled the teacher to deliver the lesson from different locations around the room and to interact with individuals or small groups of students when the need arose. The innovative use of ICT coupled with the seating arrangement, where the students were clustered in small groups, facilitated discussion and enhanced the students’ participation in the lesson.

Classroom management and student behaviour and engagement were very good. The atmosphere in the classrooms was warm, and the relationships between the teachers and students were respectful and contributed to a positive and enjoyable learning environment. In almost all cases, there was very good use of directed teacher questioning, which served to involve all of the students in the lessons and to maintain a clear focus on the lesson content. The use of higher-order questioning was less common and opportunities for students to propose alternative approaches to problem solving, and to explain their reasoning, should be more widely adopted as an integral element of lesson delivery.

The quality of student learning was, in almost all cases, very good. The students responded readily to teacher questioning and were well able to carry out the tasks assigned to them by the teachers. The quality of the students’ written work in their homework copybooks and their performance in class tests provide significant evidence of the quality of student learning. It is also evident that the school’s objective of increasing the number of students taking higher-level Mathematics in the certificate examinations is achievable and that considerable progress has already been made in this regard.
Assessment

Practices in relation to setting and correcting homework in Mathematics are very good. The school’s homework policy is comprehensive and is being implemented. The school provides specialised training for parents to enable them to support their children when doing homework. This very good practice ensures that homework enjoys a high profile and is regarded as a core activity in supporting students’ learning.

Student progress in mathematics is assessed through the use of regular class tests and more formal examinations. Non-examination classes, with the exception of TY, sit formal examinations at Christmas and just prior to the summer holidays. The papers prepared for these examinations model the structure and level of difficulty of the certificate examinations and are corrected with admirable attention to detail. In first year, common papers with agreed marking schemes are provided for the formal examinations. This good practice should be extended, and common assessments within levels should be adopted as standard practice in each year. The existing assessment policy should be amended to reflect the implementation of this recommendation and the amended policy should also refer to the different modes of assessment, including assessment for learning, currently in use in the school.

Examination students sit formal assessments at Christmas and sit mock examinations in the second term. Students in receipt of reasonable accommodation in the state examinations receive appropriate support in class and formal tests.

Reports are issued to parents after each formal assessment and ongoing communication occurs through the use of the student diary, parent-teacher meetings, coffee meetings and other less formal means.

Summary of Main Findings and Recommendations

The following are the main strengths identified in the evaluation:

- The mathematics department is very well supported by management. Timetabling provision, the quality and range of resources available to support teaching and learning and the arrangements in place to facilitate the teachers’ continuing professional development are all very good.
- Mathematics enjoys a high profile in the school and agreed strategies to promote the uptake of higher-level Mathematics are in place.
- Very good structures to support subject department planning have been established. Individual teacher lesson planning was very good in almost all cases.
- The quality of teaching and learning was, in the vast majority of cases, very good.
- Practices in relation to homework and assessment are very good.

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

- The instrument being used to determine the mathematical capabilities of students entering first year should be discarded and replaced by a mathematics competency test designed by the members of the mathematics department in partnership with the feeder primary schools.
• The qualifications profile of the mathematics department needs to be enhanced. Therefore, only fully qualified mathematics teachers should be considered when future appointments to the department are being made.

• The teaching methods espoused by Project Maths, including reduced reliance on the textbook as a classroom resource and the enhanced use of higher-order questioning, should be adopted by all members of the department.

• Mathematics classes should be set at the end of first year rather than at Christmas in second year as is currently the case.

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.