Subject Inspection of Mathematics
REPORT

Ballyhaunis Community School
Knock Road, Ballyhaunis, County Mayo
Roll number: 91461C

Date of inspection: 14 October 2010
SUBJECT INSPECTION REPORT

This report has been written following a subject inspection in Ballyhaunis Community School. 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, deputy principal and subject teachers. The board of management of the school 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 mathematics department has undergone considerable change in the recent past. Retirements of established teachers have resulted in the reorganisation of the department. Management and staff have responded very positively to the challenge and a strong and progressive department has emerged. The qualifications profile of the department is very good and capacity building during the reorganisation means that three of the teachers are in a position to teach higher-level Mathematics in senior cycle. This proactive approach to long-term planning by management is very good practice.

The procedures in place for facilitating student transfer from the feeder primary schools and for ascertaining their mathematical capabilities are student centred and feature comprehensive consultation with all of the stakeholders. All incoming students, with the exception of a very small number identified as part of the transfer programme who are placed in a separate small group, are immediately assigned to mainstream mixed-ability classes. The mainstream classes follow a common programme in Mathematics for an initial period of six weeks while students in the small group receive intensive support designed to boost their confidence in Mathematics and to enhance their numeracy. All first-year students then sit a mathematics test based purely on the material content covered during this period. Following an analysis of the outcomes of the test and a comprehensive consultation process a small learning-support class is formed. While the mathematics test adequately serves its intended purpose, it is recommended that its scope and intended outcomes be extended. Firstly, the content of the test should be developed to measure the students’ skills set in a more comprehensive fashion. Secondly, the outcomes of the analysis should not only inform the composition of the learning-support class but should also determine the content, structure and assessment of the first-year mathematics programme in order that any weaknesses evident in the students’ skills set are addressed in a structured and measurable manner during the year.

Timetabling provision for Mathematics is very good. All classes in junior cycle are provided with five classes of Mathematics per week. With the exception of the learning-support class,
Mathematics classes in first year are mixed ability and are set upon entry to second year. Mathematics classes in second and third year are scheduled concurrently within each year for the remainder of the junior cycle. Having completed the junior cycle, students have the option of entering Transition Year (TY). Currently there is one mixed-ability class in TY and it is provided with four periods of Mathematics per week including one double period. This is very good practice as the double period provides an ideal opportunity for project work and other innovative activities. There are six periods of Mathematics per week in both fifth and sixth year. The scheduling of Mathematics classes facilitates student transfer between levels, without disrupting their remaining timetable, if the need arises.

Learning-support provision in Mathematics is very well organised and is designed to address the underlying difficulties experienced by the students identified during the transfer programme. A small learning-support class in Mathematics, timetabled in parallel with the mainstream classes, is formed in each year of the junior cycle. These classes are taught by a member of the learning-support team who maintains very close links with the mathematics department, attending all departmental meetings and contributing to the design of the assessment vehicles. Many of the students in the learning-support class will sit ordinary level in the Junior Certificate examination and inclusive procedures are in place to return students to mainstream classes if it is deemed appropriate.

The mathematics department is very well resourced. A comprehensive list of the resources available to the department is included in the subject department plan. These resources are ideally suited to the type of teaching and learning espoused by Project Maths. The procedures in place regarding the purchase and storage of, and facilitating access to, resources are very good. The school’s information and communication technology (ICT) infrastructure has undergone sustained development in recent times and each classroom will shortly be equipped with a computer and data projector.

School management and the members of the mathematics department have very positive attitudes towards continuing professional development. All of the members of the department have attended the workshops provided as part of the national implementation of Project Maths and are enrolled in *ICT in Mathematics* courses provided by the local Education Centre. Given the ready access to ICT in the school, this is a very welcome development.

The profile of Mathematics in the school could be further developed. This could be achieved through whole-school celebration of Maths Week, Maths World Day and through the promotion of the different competitions promoted by the Irish Mathematics Teachers Association and other agencies. While it is acknowledged that Maths Week was being celebrated in the school during the inspection, celebrations were quite muted and many of the students were unaware of them.

**PLANNING AND PREPARATION**

Subject department planning in Mathematics is very well established. A co-ordinator, appointed as part of the schedule of posts in the school, is in place and while it is intended to review this arrangement with the intention of rotating the role of co-ordinator, any such decision should be delayed until Project Maths is fully embedded in the school. In addition, it is recommended that one member of the department assume the role of mathematics ICT co-ordinator to lead the integration of ICT in teaching and learning, while a second takes responsibility for liaising with the Project Maths regional development officer and the Irish Mathematics Teachers Association regarding the implementation of the project in the school.
Regular planning meetings are held. In response to the recent changes in the structure of the department, the number of meetings has increased considerably. The minutes of these meetings reflect the amount of work done by the department during the restructuring process and the commitment of the teachers to the department’s ongoing development. A comprehensive subject department plan has evolved from this process. The plan, which will be very valuable in scaffolding the department’s activities and in supporting its development, contains a number of innovative ideas including the arrangements in place to support the more able students.

The schemes of work detailed in the plan are very good. The schemes for each year and level are presented in an individual matrix which contains the content, a precise delivery schedule and the resources to be integrated in lesson delivery. The schemes could be further enhanced if they mirrored the Project Maths syllabuses with the content being expressed in terms of learning outcomes and if the matrix were extended to include suggested teaching methods and agreed procedures for carrying out key mathematical operations. Greater detail in relation to the resources to be integrated in lesson delivery should also be considered.

The subject department plan contains a separate section for Mathematics in TY. The material being covered in TY is appropriate to the overall aims of the TY programme and provides ample opportunity for practical and project work. The plan would benefit from greater clarity in relation to the intended learning outcomes and from specifying the project work with which the students will engage.

The good practice in relation to subject department planning was also evident in manner in which teachers approached their own lesson planning. The range of resources that was seamlessly integrated into the lesson delivery, the structure of the lessons and clarity with which the lesson content was delivered were all indicative of very high quality lesson planning.

**TEACHING AND LEARNING**

The quality of teaching observed during the inspection was very good. A particularly impressive feature of the lessons was the ability of the teachers to contextualise the material being covered and to link it to the students’ prior learning and to their wider interests. One example of this was the use of matrix multiplication to calculate the points gained by a number of teams in the previous weekend’s matches in a given football league. The idiosyncrasies of matrix multiplication became evident as the lesson unfolded and the approach adopted by the teacher greatly enhanced the students’ understanding and appreciation of the Mathematics of matrices.

A very good mix of teaching methods was in evidence. In one instance the overhead projector, solid models and a graduated worksheet were skilfully integrated in a lesson exploring the properties of a cylinder. Following an excellent introduction facilitated by the overhead projector, the models were used to illustrate the meaning of volume and surface area as they apply to the cylinder. The students then engaged in pair work, taking measurements and carrying out calculations. A review of the lesson was conducted prior to the end of the lesson and a worksheet designed to reinforce the lesson content was distributed. The worksheet showed an admirable degree of differentiation and was ideally suited to its intended purpose.

In another lesson, ICT was used to very good effect to review the basic rules of algebra and to introduce simple equations. The lesson content was delivered using a very good presentation prepared in advance and supported by interventions at critical moments by the teacher at the marker board. The use of the technology facilitated very effective teacher movement and reinforced the correct use of procedure and mathematical language. A worksheet, again featuring
very good differentiation, served to reinforce the lesson content and to prompt very good student questions.

Classroom management, student behaviour and engagement were very good. Directed and global questioning, which served to check student learning and to involve all of the students in the lesson, was an important technique adopted by all of the teachers. While this worked well, there should be greater emphasis on the use of higher-order questions which encourage the students to hypothesise and serve to generate solution curiosity. The majority of teachers have their own base room and have created warm and visually stimulating learning environments through the use of locally produced and bespoke posters and other subject-specific paraphernalia.

The quality of student learning, as evidenced by student responses during lessons, their performance in class tests and in the house examinations, is very good. Students from the school perform very well in the state examinations; however, it is recommended that initiatives, to ensure that the majority of students taking higher-level Mathematics in the Junior Certificate continue to higher-level in the Leaving Certificate, be implemented.

**ASSESSMENT**

The members of the mathematics department collaborate very effectively to ensure that practice in relation to homework and assessment is consistent across the department and that the vehicles used to measure student progress are of a very high standard. Homework is assigned and corrected as an integral part of lesson delivery. The students’ homework copybooks are very well maintained and feature teacher comments and corrections together with suggestions as to how the students’ work might be improved.

All classes have formal assessments at Christmas. Students in third and sixth year sit mock examinations early in the second term while the remainder have end-of-year assessments in May each year. Common papers with agreed marking schemes are provided within levels for all formal examinations. The content of the papers is agreed at meetings of the mathematics department which are held prior to the assessments. The quality of the papers and the clarity of the marking schemes emerging from these meetings are testament to the value the meetings bring to the department’s planning in relation to assessment.

Very good use is made of the student diary in recording homework assignments and in facilitating ongoing communicating with parents. Students receive instructions on how the diary should be used to maximum effect during meetings with their class tutors and the teachers use the student diaries to record the results of class tests and to note any compliance issues. The diaries are collected prior to parent-teacher meetings and, following a review by the relevant year head, they are given to the individual parents who use them during the meetings to inform their conversations with the teachers. This is very good practice.

**SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS**

The following are the main strengths identified in the evaluation:

- The qualifications profile of the mathematics department is very good and the department is strong and progressive.
- Procedures for facilitating student transfer from the feeder primary schools and for determining their mathematical capabilities are very good. Learning-support provision is designed to address the underlying difficulties experienced by the students identified during the transfer programme.
• Timetabling provision for Mathematics is very good.
• The mathematics department is very well resourced and school management and the members of the mathematics department have very positive attitudes towards continuing professional development.
• Subject department planning and individual teacher planning are very good. Planning in relation to ongoing student assessment is particularly good.
• The quality of teaching and learning is very good.

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

• It is recommended that the mathematics test provided at the beginning of first year be reviewed with the intention of measuring the students’ skills set in a more comprehensive fashion and of determining the content, structure and assessment of the first-year mathematics programme. This should result in the weaknesses evident in the students’ skills being addressed in a structured and measurable manner during the year.
• It is recommended that one member of the department assume the role of Mathematics ICT co-ordinator to lead the integration of ICT in teaching and learning, while a second takes responsibility for liaising with the Project Maths regional development officer and the Irish Mathematics Teachers Association regarding the implementation of the project in the school.
• It is recommended that initiatives, to ensure that the majority of students taking higher-level Mathematics in the Junior Certificate continue to higher-level in the Leaving Certificate, be implemented.

Post-evaluation meetings were held with the teachers of Mathematics and 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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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 the school accept the contents of the report as being fair and accurate.

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 Board, School Management and the teachers will carefully study the report and attempt to implement the findings and recommendations.