

Education and Training Inspectorate

Issues from Inspection

TRANSITION IN MATHEMATICS: PRIMARY TO POST-PRIMARY

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TRANSITION IN MATHEMATICS: PRIMARY TO POST-PRIMARY

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1. INTRODUCTION

- 1.1 In the preface to his 2006-2008 report¹, the Chief Inspector indicated that:

Those responsible for an individual's education need to build more effectively on the skills, knowledge and attributes which the learner has developed in the preceding phase.

Moreover, within the body of the text, he reported that only one in 20 post-primary inspections involving mathematics identified effective links between the mathematics teachers and the numeracy co-ordinators (NCs) of the feeder primary schools.

- 1.2 This statistic builds on an earlier evaluation based on the mathematics inspections between 2001 and 2006 and reported in Better Mathematics²:

...the Schemes of Work for year 8 often represented regression rather than progression from the pupils' mathematical experiences in their primary schools; this practice regularly accompanied a perceived lack of time to complete the content for the appropriate tier of entry at the end of KS3 or at GCSE.

- 1.3 During the period December 2008 to December 2009, the Education and Training Inspectorate (Inspectorate) visited eleven³ post-primary schools and 13 feeder primary schools in seven geographical areas⁴. On a few occasions during December 2009, it was possible to observe and interview pupils in year 8 who had been observed the previous year, in year 7. The names of the schools visited are listed in the Appendix.

1 *Chief Inspector's Report 2006-2008, ETI, January 2009* (www.etini.gov.uk/ci_report.pdf)

2 *Better Mathematics: evaluation and prompts for self-evaluation and improvement in post-primary schools, ETI, January 2007* (www.etini.gov.uk/better_mathematics-3.pdf)

3 *Seven of the post-primary schools were visited purely for the purposes of the survey; two were inspected in 2009-10, and the remaining two were inspected in 2008-09 and visited again in 2009-10.*

4 *Antrim, Ballynahinch, Belfast, Dungannon, Lisburn, Strabane and Tandragee*

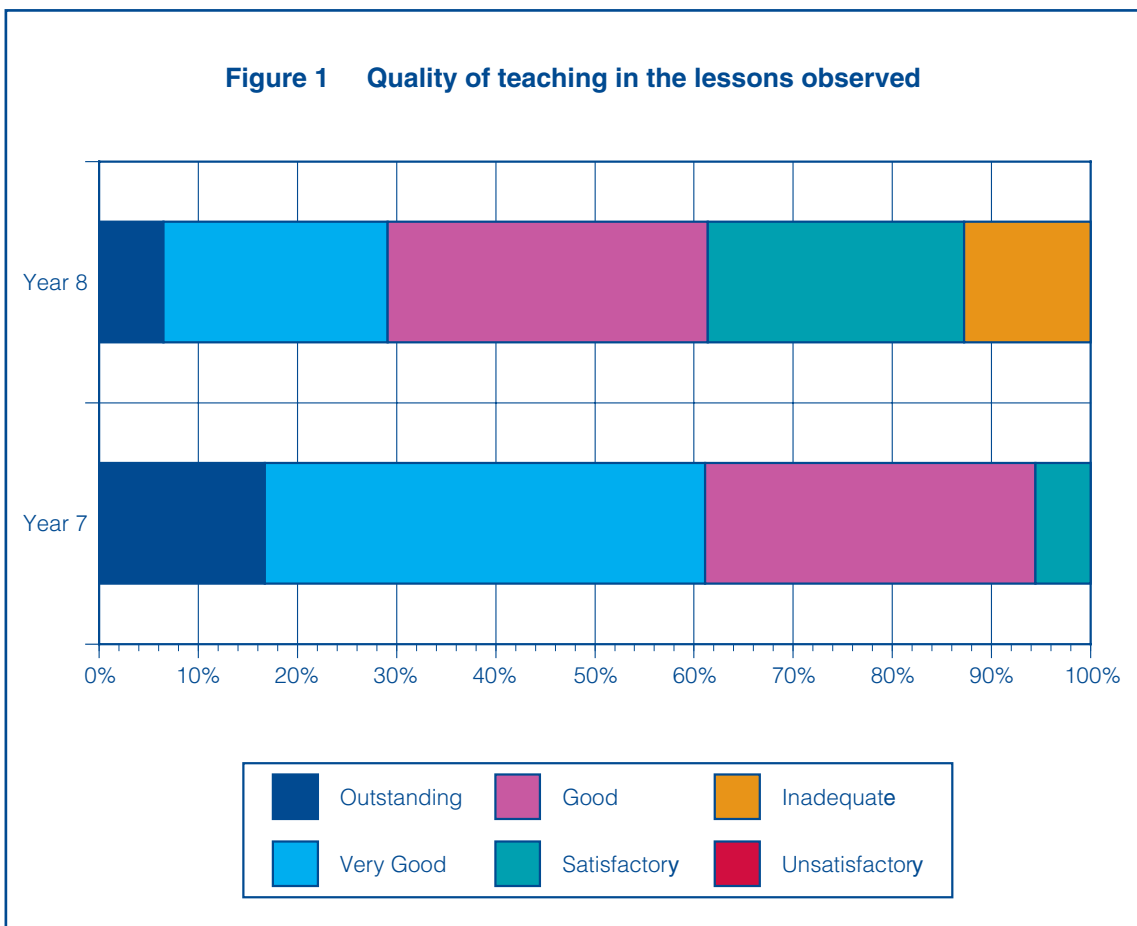
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- 1.4 During the visits, inspectors observed year 7 and year 8 mathematics lessons and examined relevant documentation, including the schemes of work (SoWs). Discussions were held with the Principals, the post-primary school heads of department (HoDs), the primary school NCs and year 7 teachers, and the post-primary school teachers who have responsibility for primary school liaison. In total, 52 meetings took place and 49 lessons were observed. Year 8 pupils were interviewed in nine of the post-primary schools. In addition, the views of the five Education and Library Board (ELB) Mathematics Advisors were sought at the 2008 annual meeting of advisors and mathematics inspectors.

- 1.5 Section 2 of the report summarises the evidence gathered during the 24 visits and the ongoing inspections of, and specialist visits to, primary and post-primary schools. Sections 3 and 4 list the conclusions and recommendations arising from this evidence.

2. SUMMARY OF EVIDENCE

The Mathematics Lessons Observed



2.1 The quality of the teaching in the year 7 and year 8 lessons observed differed greatly, as illustrated in Figure 1 above. Just over 60% of lessons in the primary schools, compared with just under 30% of the lessons in the post-primary schools, were evaluated as very good or better.

2.2 In most of the year 7 lessons, the teachers matched the work to the needs of all of the children and provided appropriate challenge that engaged the children in active and relevant work; the children worked well in pairs or small groups and at times information and communication technology (ICT) was used to enhance the learning. Most of the lessons were well structured: the intended learning was shared with the children at the beginning and reviewed through plenary sessions at the end.

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- 2.3 Too many of the year 8 lessons observed involved the pupils working quietly on questions, from a textbook or worksheet, that were repetitive and not sufficiently challenging. Often the teacher failed to plan properly for the end of the timetabled period resulting in the lesson not drawing to an effective conclusion.

The Views Of The Pupils In The Post-Primary Schools

- 2.4 The year 8 pupils reported that they had been introduced to little new material in mathematics during their first term, although they indicated that they had covered some topics taught in primary school to a higher level. When asked to elaborate, they explained that they thought the questions had been harder. The evidence gathered from the year 8 SoWs supported their comments.
- 2.5 Some of the pupils in the selective schools reported that the work in mathematics was easy, although they added that they enjoyed the sense of achievement from answering all the questions correctly. The pupils in one school reported that they appreciated being taught by mathematics specialists. Some pupils in the non-selective schools reported that their confidence in mathematics had increased as a result of revisiting topics covered in primary school.
- 2.6 Many of the pupils displayed a lack of enthusiasm for their mathematics lessons. Significantly, in a few of the non-selective schools, the pupils indicated that the most enjoyable lessons were those in which they were able to work in pairs and groups, for example, completing statistical investigations.
- 2.7 In most of the schools visited, the year 8 pupils talked appreciatively and positively about their experiences in mathematics at primary school; they commented on the range of activities, including the opportunities they had to use ICT in their mathematics lessons.

The Views Of The Teachers

- 2.8 The teachers in the post-primary schools reported the need to revise and consolidate the pupils' previous learning, resulting in a 'starting with a clean slate' approach to mathematical concepts. In the selective schools, they reported that the large number of feeder primary schools necessitated this approach. In almost all of the schools visited, there was an emphasis on

Number at the start of year 8 although one of the schools had introduced aspects of logical thinking at the start of the term in order to enthuse the pupils. In a few schools, the order of the textbook topics was reported as the rationale for starting with, and concentrating on, Number.

- 2.9 Most of the mathematics teachers in the post-primary schools were unaware of the mathematics curriculum or the typical teaching and learning strategies used in year 7. The statements within the Revised Lines of Development⁵, particularly those identified in the 'blue' section, had little, if any, influence on the SoWs, which were often overly dependent on the textbook being used.
- 2.10 Most of the year 7 teachers were unaware of the children's mathematical experiences when they transfer to the post-primary schools.
- 2.11 There was evidence that some year 7 teachers are reluctant to link with post-primary teachers because they feel that their professional input may not be valued. The ELB Mathematics Advisors reported that this view was held by many primary school teachers.

The Links Between The Primary And Post-Primary Schools

- 2.12 While post-primary schools have procedures in place to link with their feeder primary schools, these arrangements generally support the sharing of pastoral information and are focused on familiarising the year 7 children with the life and work of the post-primary school.
- 2.13 In most cases, when the transferring children are known to the post-primary school, specific teachers arrange to visit each feeder primary school to meet with the Principal or special educational needs co-ordinator or both.
- 2.14 A minority of the post-primary schools arrange for the transferring children to visit the school for a day in June. The purpose of this day is to familiarise the children with the school building, their year heads and tutors, and other aspects of school life. The children transferring to the non-selective schools

5 Revised Lines of Development for Mathematics/Numeracy, CCEA

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are often tested in literacy and numeracy to facilitate banding and streaming when they start school in September. Other schools test the year 8 pupils at the beginning of the first term. A very small number of the non-selective schools use the performance data from the primary school.

The Transfer Of Performance Data

- 2.15 Generally the key stage (KS) 2 levels of attainment (LoAs) achieved by the prospective pupils are forwarded to the post-primary schools; however, most HoDs reported that they had not received this information or didn't make use of it. One Principal reported that he had no confidence in the reliability of KS2 LoAs.
- 2.16 The more detailed performance data obtained through the use of standardised tests⁶ was generally not forwarded to the post-primary schools. Whilst the Principals of the primary schools were uncertain about what performance information could be transferred to post-primary schools, both post-primary and primary school teachers acknowledged the potential benefits of sharing this information.
- 2.17 In regard to special educational needs (SEN) information on individual children, the targets relating to numeracy from the Individual Educational Plans were not passed on to the post-primary school. The teachers in the primary schools were also uncertain about what SEN information they are permitted to share with the post-primary schools.

Examples Of Effective Practice

- 2.18 Three of the post-primary schools visited are in the Specialist Schools Initiative. As part of this initiative, the schools have developed partnerships with a number of primary schools in their local community. In two of the schools, this involves sixth form pupils visiting the primary schools to work with the children in mathematics lessons.

⁶ For example, *Progress in Mathematics from GL Assessment (previously known as NFER)*

- 2.19 One of the Specialist Schools arranged a meeting of its HoD and the NCs in the partner primary schools and six other local primary schools. The benefits of a common approach to the development of mathematical language were discussed and resource material has since been developed. The school intends to share this resource with three other local post-primary schools.
- 2.20 In some of the other post-primary schools, specific events relating to mathematics were organised as part of the familiarisation days in June. One school ran separate mathematics days during which year 7 children worked in groups, supported by year 12 pupils, on problems and investigations. Another post-primary school has had regular primary school liaison meetings, during which the KS2 SoWs and textbooks have been discussed.
- 2.21 In a primary school visited as part of the normal cycle of inspection, a summary of the year 8 SoW for the post-primary school to which the majority of the children transfer was on display. At appropriate times during a lesson observed, the year 7 teacher referred to the summary in order to set the work in context for the children and demonstrate the progression in mathematical concepts and skills.

3. CONCLUSIONS

- 3.1 Post-primary mathematics teachers are insufficiently aware of the range of learning and teaching strategies that the pupils have experienced in year 7, particularly the strategies that extend their ability to reason, draw conclusions and justify their mathematical thinking often through collaboration with their peers.
- 3.2 Post-primary teachers are generally unaware of the standard of work completed and, importantly, of the high quality of mathematical thinking attained by many of the year 8 pupils during the previous year. They take insufficient account of the pupils' previous mathematics curriculum when agreeing the year 8 SoW.
- 3.3 Primary school teachers, primarily the year 7 teachers and the NCs, are unfamiliar with the mathematics that the children will learn in post-primary schools.
- 3.4 There is insufficient transfer of records of the children's attainment in mathematics between primary and post-primary schools.

Summary

3.5 In 1999, the Inspectorate published a report⁷ on primary school inspections between 1992 and 1998. It included the following evaluation:

Although a majority of the schools inspected had developed some valuable links with their local secondary schools, for the most part the contacts established focused on the pastoral dimension of ensuring the children's smooth transition. Both phases had given a low priority to the development of strategies to promote continuity and progression in learning across KS2 and KS3. In only 12% of the schools inspected was there evidence of the development of links which had facilitated the sharing of information and expertise about the curriculum.

...schools need to make greater effort towards the establishment of effective links across the primary and secondary schools' curricula in order to ensure that the children's achievements in one phase are built upon in the next.

The summary conclusion drawn from the evidence of this survey is that, **in regard to mathematics, there has been no significant improvement in the sharing of information and expertise about the curriculum between primary and post-primary schools.**

⁷ *Children and Their Learning: Primary Inspections (1992-1998)*, ETI, 1999

4. RECOMMENDATIONS

- 4.1 Post-primary mathematics teachers, primarily the HoD, need to be more familiar with the year 7 mathematics curriculum to ensure progression in the pupils' learning. In particular, the year 8 mathematics curriculum needs to build on the pupils' previous learning, reducing the unnecessary repetition that often occurs.
- 4.2 Year 7 teachers and NCs need to be more familiar with the mathematics that the children will learn in post-primary in order to ensure greater continuity and progression in the children's learning.
- 4.3 In order to address the two recommendations above, joint professional development opportunities, both formal and informal, need to be put in place.
- 4.4 There is a need to improve the transfer of relevant mathematics and numeracy performance data between primary and post-primary schools to enable the post-primary mathematics teachers to meet more effectively the needs of the pupils.

APPENDIX

SCHOOLS⁸ VISITED AS PART OF THE SURVEY

NAME	DE REF NO
Primary	
Antrim Primary School	301-0829
Christ The King Primary School, Drumaness	403-1328
Clare Primary School, Tandragee	501-1142
Loanends Primary School, Crumlin	301-0745
Old Warren Primary School, Lisburn	401-6144
St Anne's Primary School, Strabane	203-6389
St Bride's Primary School, Belfast	103-6075
St Mary's Boys' Primary School, Strabane	203-2689
St Michael's Primary School, Belfast	103-6140
St Patrick's Primary School, Ballynahinch	403-1665
St Patrick's Primary School, Donaghmore	503-2678
St Patrick's Primary School, Dungannon	503-6504
Tandragee Primary School	501-1116
Post-Primary	
Antrim Grammar School ⁹	341-0209
Aquinas Diocesan Grammar School, Belfast	142-0277
Assumption Grammar School ¹⁰ , Ballynahinch	442-0086
Holy Cross College, Strabane	223-0301
Lisnagarvey High School, Lisburn	421-0051
New-Bridge Integrated College, Loughbrickland	526-0285
The Royal Belfast Academical Institution	142-0027
St Colman's High School, Ballynahinch	423-0161
St Joseph's College, Belfast	123-0275
St Patrick's Academy ¹¹ , Dungannon	542-0304
Tandragee Junior High School	521-0143

⁸ The Inspectorate also wishes to acknowledge the co-operation of the staff of Edenderry Primary School, Portadown.

⁹ Specialist School for mathematics and ICT

¹⁰ Specialist School for music

¹¹ Specialist School for science

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