The 2010 National Assessments of English Reading and Mathematics in Irish-Medium Schools

Main Report

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Educational Research Centre

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Key Terms

DEIS	Delivering Equality of Opportunity in Schools. DEIS is an action plan put in place by the (now) Department of Education and Skills in 2005 to address the effects of educational disadvantage in schools.
e-App.	Indicates that the table referred to can be found in an e-Appendix, located at www.erc.ie/documents/naims_e-appendix.pdf. There are two types of tables in the e-Appendix – tables that expand on those in this report (e.g., e-App. Table A4.1), and additional data tables, referred to only in the text of this report (e.g., e-App. Table E4.1).
Gaeltacht Schools	Schools in official Gaeltacht areas in which all subjects (except English) are taught through Irish. This category, as defined in the current study, excludes Gaeltacht schools that do not teach all subjects (except English) through Irish.
Irish-Medium Schools	Schools in which Irish is the medium of instruction in all subjects except English. These include SLG and Gaeltacht schools (also defined here).
NA '09	National Assessments of Mathematics and English Reading conducted in Second and Sixth classes in Spring 2009. Many of the outcomes of the current study are compared with those of NA '09. See Eivers et al. (2010a, 2010b) for full reports on NA '09.
NAIMS	National Assessments of English and Mathematics in Irish-medium Schools 2010 (the current study), which was implemented in Second and Sixth classes in Scoileanna Lán-Ghaeilge (SLG) and Gaeltacht schools in Spring 2010.
SES	Socioeconomic status. In the current study, SES is based on parents' occupations.
SLG	Scoilenna Lán-Ghaeilge or Gaelscoileanna. Schools outside the official Gaeltacht areas in which all subjects (except English) are taught through the medium of Irish.
SSP	School Support Programme under DEIS (see above). SSP comprises a set of measures that provides schools with additional human and material resources to tackle educational disadvantage, in schools with the highest levels of assessed disadvantage. Urban schools in the SSP are allocated to Band 1 or Band 2, depending on their level of disadvantage. There is a separate set of measure for rural schools.

Preface

In 2009, national assessments of English reading and mathematics were carried out by the Educational Research Centre on behalf of the (then) Department of Education and Science. [*]

The assessments involved nationally representative samples of schools and pupils, including Scoileanna Lán-Ghaeilge and Gaeltacht schools. However, in reporting the outcomes (see Eivers et al., 2010a, 2010b), it was not possible to provide separate estimates of achievement for Irish-medium schools, as the numbers of such schools and pupils in the sample were too small. Therefore, the Centre was asked to implement the national assessments in representative samples of Scoileanna Lán-Ghaeilge and Gaeltacht schools in 2010. This report describes the outcomes of those assessments, and compares the outcomes with those of the 2009 national assessments.

The aims of the 2010 assessments were:

- to establish current English reading and mathematics standards of Second and Sixth class pupils in Irish-medium schools, and to compare these with overall national standards;
- to provide high quality and reliable data that can be used by the Department of Education and Skills in policy review and formulation and in decisions regarding resource allocation in the areas of English reading and mathematics;
- to provide information and advice to schools and teachers in order to assist in school planning designed to improve teaching and learning in English reading and mathematics;
- to identify factors relating to reading instruction in English in Irish-medium schools;
- to examine school, teacher, home background, and pupil characteristics, and teaching methods which may be related to English reading and mathematics achievement;
- to establish a baseline against which to compare future performance in English reading and mathematics in Irish-medium schools.

Over the past decade, and particularly in the aftermath of the publication of Circular 0044/2007 (DES, 2007)[†], there has been considerable debate on the effectiveness of full immersion in the early years of primary schooling, and on the benefits of beginning the teaching of reading in English or in Irish. The current study is not designed to inform these issues. Rather, its purpose is to compare performance in English reading and mathematics across school types, and to identify those factors that are associated with performance in the sectors of interest – Scoileanna Lán-Ghaeilge and Gaeltacht schools. National assessments provide indicators of performance at a given point in time, and are not intended to evaluate the effectiveness of different approaches to language teaching. Pupils were not assigned to schools at random, nor were prior (incoming) skills or early reading performance taken into account. It was not possible to investigate the

[*] By the time NAIMS was conducted, the title of the Department had changed to the Department of Education and Skills.

[†] The Circular required Irish-medium (Scoileanna Lán-Ghaeilge and Gaeltacht) schools to teach 2.5 hours of English every week, from, at the latest, the second term of Junior Infants. The circular was withdrawn by the (then) Department of Education and Science in January, 2010.

characteristics of pupils who may have left their schools before the end of Sixth class. As well as providing a rich descriptive base, the current study raises questions that can be addressed using experimental or other appropriate research methodologies.

Overview of the Report

This report is divided into 8 chapters. Chapter 1 provides a broad context for the 2010 National Assessments of English Reading and Mathematics in Irish-medium schools (NAIMS), including a review of earlier national assessments involving such schools. Chapter 2 describes the survey methodology and the instruments used. Chapter 3 summarises achievement outcomes of NAIMS, as well as comparisons with the 2009 National Assessment of Mathematics and English Reading in primary schools. It describes performance on proficiency levels, differences in performance between boys and girls, and associations between teachers' and parents' ratings and pupil performance. Chapter 4 profiles pupils and their families. It describes the characteristics of families (including immigrant status and socioeconomic background), the home educational environment, parents' and pupils' attitudes to Irish, and parents' reasons for selecting Irish-medium schools and their plans for their child's post-primary schooling. Chapter 5 profiles schools and teachers. It includes characteristics of the school, teachers' involvement in professional development, learning support provision, school-level learning resources, assessment and feedback, and school policy on the language sequence in which beginning reading is taught. Chapter 6 describes the teaching and learning of English and mathematics in classrooms, covering such issues as planning for instruction, the language of instruction in mathematics classes, the resources used by teachers, grouping for instruction and the use of non-standardised assessment instruments. Chapter 7 looks in more depth at associations between school, teacher and student variables and achievement in the context of multi-level models of performance. Conclusions and recommendations are offered in Chapter 8.

Acknowledgements

The Educational Research Centre wishes to acknowledge the support of the National Advisory Committee which was appointed by the Minster of Education and Skills to assist the Centre in implementing both the 2009 National Assessments of Mathematics and English Reading and the current study. The members of the Committee are: Carmel Nic Airt (An Foras Pátrúnachta), Dónal Ó hAiniféin (Gaelscoileanna), Mark Candon (CPSMA), Deirbhile Nic Craith (INTO), John Curran (IPPN)(replaced by Aedín Ní Thuathail from October 2011), Arlene Forster (NCCA), Áine Lynch (NPC–P), and Ciara O'Donnell (PDST) (replaced by Mary Manley in October 2011). The Department of Education and Skills is represented by Margaret Kelly, Pádraig Mac Fhlannchadha (Chair until July 2011) and Caitríona Ní Bhriain (Chair from August 2011). ERC staff on the Committee are Eemer Eivers and the authors of this report.

A Working Group was established to advise the Centre on modifications that could be made to the questionnaires used in the 2009 National Assessments to ensure their appropriateness for the current study. Thanks are extended to members of this group: Pádraig Ó Duibhir (Coláiste Phádraig, Droim Conrach), Tina Hickey (An Coláiste Ollscoile, Baile Átha Cliath), and Marina Ní Threasaigh (An Roinn Oideachas agus Scileanna). Thanks are due to Nick Sofroniou for assistance with Chapter 7. Thanks are also extended to staff at the ERC, including Peter Archer (Director), Jude Cosgrove, Mary Rohan, Paula Chute, John Coyle, Eemer Eivers, Caoimhe Mairtín, and Hilary Walshe. Finally, we thank the school principals, teachers, pupils and parents who participated in the study.

Executive Summary

In May 2010, National Assessments of English Reading and Mathematics were administered to pupils in Second and Sixth classes in a representative sample of Scoileanna Lán-Ghaeilge (SLG) and Gaeltacht schools in which Irish was the medium of instruction. The instruments and methodologies used in NAIMS mirrored those used in the 2009 National Assessments of Mathematics and English reading (NA '09) (Eivers et al., 2010a), which had been implemented at the same class levels in May 2009. The design of NAIMS allowed for a comparison of performance between pupils in Second and Sixth classes in Irish-medium schools, and their counterparts in NA '09. Like NA '09, NAIMS also looked at aspects of the teaching of English reading and mathematics in schools, and identified factors associated with performance.

NA '09 marked the first occasion on which pupils in Second and Sixth classes were assessed in national assessments of English reading and mathematics. New assessment frameworks based on the primary school curriculum were developed and new tests produced. The mathematics test was translated into Irish. Questionnaires for school principals, teachers, parents and pupils were also developed so that information could be gathered on background characteristics in order to contextualise achievement outcomes. Achievement scales and subscales were all set to a mean of 250 and a standard deviation of 50. Proficiency scales – descriptions of achievement at different levels of pupil performance – were also developed. All instruments used in NA '09 were used in NAIMS, though some of the questionnaires were modified to include questions relating to the specific circumstances of Irish-medium schools.

Fifty-four SLG and 51 Gaeltacht schools participated in NAIMS, representing response rates of 90% and 85% respectively. Across school types and class levels, 4273 pupils completed English reading tests while 4288 completed mathematics tests. Within participating schools, response rates exceeded 90% for all tests and questionnaires. The tests were administered by the pupils' teachers. Administration was monitored by members of the Inspectorate who reported high levels of compliance with procedures.

The next two sections provide information on achievement in English reading and mathematics in Irish-medium schools. These sections should be read in conjunction with subsequent sections which seek to explain performance within the context of variables such as socioeconomic status (at school and pupil levels), home educational resources, engagement in reading and related activities.

Achievement in English reading

In NAIMS, pupils in Second and Sixth classes in SLG, and pupils in Sixth class in Gaeltacht schools had significantly higher mean scores on English reading than pupils in NA '09. Differences in favour of pupils in Second and Sixth classes in SLG were about one-third of a standard deviation, while in Sixth class in Gaeltacht schools, the difference was one-sixth of a standard deviation. In Second class, but not Sixth, pupils in SLG had a significantly higher mean score than pupils in Gaeltacht schools.

Within Gaeltacht schools, girls in Sixth class had a significantly higher mean score than boys. No significant differences between boys and girls in SLG at either Second or Sixth class, or in Gaeltacht schools at Second class, were observed.

On the English reading proficiency scales, 17% of pupils in Second class and 15% in Sixth class in SLG achieved at Level 4, the highest level. This was greater than in Gaeltacht schools (10% and 11% respectively) or in NA '09 schools (10% and 10%). In both SLG and Gaeltacht schools, only 4-6% in Second and Sixth classes were classified as achieving below Level 1, compared with 10% in NA '09 schools.

At Second and Sixth classes, pupils in SLG achieved higher mean scores than their counterparts in NA '09 on reading vocabulary, reading comprehension and the reading subprocesses of Retrieve, Infer, and Interpret & Integrate. Pupils in Sixth class also achieved a higher mean score on Examine & Evaluate (the latter was not assessed in Second class). At Second class in Gaeltacht schools, mean scores on reading vocabulary, reading comprehension and the subprocesses of Retrieve, Infer and Interpret & Integrate were slightly but not significantly higher than those of pupils in NA '09 schools. At Sixth class in Gaeltacht schools, the mean scores of pupils on reading vocabulary and reading comprehension, and on the subprocesses of Retrieve, Infer, and Interpret & Integrate were significantly higher than those of pupils in NA '09, while performance on Examine & Evaluate was not significantly different.

Achievement in mathematics

In mathematics, pupils in Second class in SLG and in Sixth class in Gaeltacht schools achieved mean scores that were significantly higher (by one-sixth of a standard deviation in each case) than pupils at these class levels in NA '09. Although pupils in Sixth class in SLG and Second class in Gaeltacht schools had higher mean scores than their counterparts in NA '09, differences did not reach statistical significance. The mean scores of pupils in SLG and Gaeltacht schools were not significantly different from one another at either class level. Boys in Second and Sixth classes in SLG significantly outperformed girls, with a difference of one-quarter of a standard deviation in Second and one-sixth in Sixth. No such gender differences were found in either Gaeltacht schools or in schools in NA '09.

At both Second and Sixth classes, about 10% of pupils in SLG, Gaeltacht and NA '09 schools achieved at Level 4 (the highest level) on the mathematics proficiency scales. In Second class, about 10% in each school type achieved below Level 1. In Sixth class, half as many pupils in Gaeltacht schools (5%) as in NA '09 schools (10%) achieved below Level 1. The corresponding estimate for SLG was 7%.

In Second class in SLG, 9% of pupils took the mathematics test in English, while in Sixth class, 19% did so. The corresponding figures for Gaeltacht schools were 51% and 41% respectively. Pupils in Second class in both SLG and Gaeltacht schools taking the test in English had higher mean scores than pupils taking the test in Irish, but differences were not statistically significant. At Sixth class, pupils in SLG who sat the mathematics test in Irish had a slightly higher mean score than those who sat it in English, while pupils in Gaeltacht schools who sat the test in English had a slightly higher mean score than those who sat it in Irish. Neither difference was statistically significant.

In SLG, the mean scores of pupils in Second class on Number/Algebra, Measures and Data were significantly higher than those of pupils in NA '09 schools while performance on Shape & Space was significantly lower. Performance was also higher on Implement and Apply & Problem-Solve questions. The mean scores of pupils in Sixth class in SLG were significantly higher than those of pupils in NA '09 on Number/Algebra and Implement. In Gaeltacht schools, pupils in Second class had significantly higher mean scores than pupils in NA '09 schools on Measures and on

Implement and Apply & Problem Solve. At Sixth class, pupils in Gaeltacht schools significantly outperformed their counterparts in NA '09 schools on Number/Algebra, Measures and Shape & Space (but not Data), and on Recall, Implement and Apply & Problem Solve.

Pupils and their families

The average socioeconomic status (SES) of pupils in SLG was significantly higher (by between one-third and one-half of a standard deviation) than that of pupils in Gaeltacht schools or schools in NA '09. Based on NA '09 criteria, 20% of pupils in Sixth class in SLG were in low-SES families, compared with 39% in Gaeltacht schools, and 32% in NA '09 schools. Conversely, 45% of pupils in SLG were in high-SES families, compared with 28% in Gaeltacht schools, and 30% in NA '09 schools. At Second and Sixth classes, pupils in high-SES families in both SLG and Gaeltacht schools achieved significantly higher mean scores in English reading than pupils in low-SES families. Pupils in medium-SES families also had significantly higher mean scores than pupils in low-SES families[1]. A similar pattern was observed at Second and Sixth class levels for mathematics in SLG. The association between SES and achievement in mathematics was less robust in Gaeltacht schools where the only significant difference was between Sixth class pupils from low- and high-SES families.

In SLG, 7% of pupils in Second class and 6% in Sixth were born outside Ireland, compared with 11-13% of pupils in Gaeltacht schools, and 14-15% in NA '09. In both SLG and Gaeltacht schools at Second and Sixth class levels, fewer than 2% of pupils reported speaking a language other than English or Irish as their main home language. Few pupils in SLG reported that Irish was the main language in their homes (Second: 4%; Sixth: 2%) whereas one-fifth of pupils in Second class in Gaeltacht schools, and one-quarter in Sixth reported this to be the case.

Few significant differences in achievement were observed between pupils who mainly spoke English and those who mainly spoke Irish at home. However, in Gaeltacht schools at Sixth class only, pupils who spoke English at home had a significantly higher English reading mean score than pupils who spoke Irish (by one-third of a standard deviation), and a significantly higher mean score than those who spoke another language (by over one standard deviation, though, as noted, the latter group comprised just 2% of the sample).

A sizeable minority of pupils in SLG (Second class: 21%; Sixth class: 39%) lived in homes where neither parent could speak Irish and most (Second: 88%; Sixth: 87%) lived in homes where neither parent had attended an Irish-medium primary school. It was less common for pupils in Gaeltacht schools (Second: 31%; Sixth: 24%) to live in homes where neither parent had attended an Irish-medium primary school.

Parents reported having fewer Irish language books at home than English language books. Across Gaeltacht and SLG schools, up to two-thirds of pupils had 10 or fewer Irish books at home while only one in ten pupils in Gaeltacht schools and one in twenty pupils in SLG had 10 or fewer English books at home. Pupils in SLG had significantly more books at home on average than their counterparts in Gaeltacht schools. The difference at Second class was 30 books, while at Sixth class, it was 40. As in NA '09, there was a positive association between number of books in the home and pupil achievement in English reading. The number of books in the home can be interpreted as reflecting the educational environment in the home.

[1] The exception was at Second class in Gaeltacht schools where there was no statistically significant difference in the mean reading achievement of pupils from medium-SES families and those from low-SES families.

At Second and Sixth classes, pupils who had access to both reference books (e.g., dictionaries or encyclopaedias) and educational games (including software) at home (86% in SLG and 70% in Gaeltacht schools) had significantly higher mean English reading scores than pupils who had access to just one or neither of these resources.

As in NA '09, pupils who reported having a TV in their bedroom had significantly lower English reading and mathematics scores on average than pupils with no TV in their bedroom. Pupils in low-SES families, and boys in particular, were more likely than pupils in high-SES families to have a TV in their bedroom.

Schools and classrooms

Almost all Gaeltacht schools were located in villages or rural areas. A majority of SLG were located in cities and their suburbs, or in towns. Eight percent of pupils in Sixth class in SLG attended urban schools in the School Support Programme (SSP) under DEIS (Bands 1 and 2) while 44% in Sixth class in Gaeltacht schools attended rural SSP schools. In Second and Sixth classes in SLG, pupils in SSP schools had significantly lower mean scores than pupils in non-SSP schools in both English reading and mathematics. In Gaeltacht schools, pupils in Second class in SSP schools had a significantly lower mean score in English reading than pupils in non-SSP schools. However, differences for English in Sixth class and mathematics in Second and Sixth classes were not statistically significant.

As with pupil SES, school average SES of SLG was significantly higher than the average SES of Gaeltacht schools (by one standard deviation) and schools in NA '09 (by four-fifths of a standard deviation), while the averages for Gaeltacht and NA '09 schools were not significantly different from one another.

While just 14% of pupils in Sixth class in SLG were in multi-grade classes, 65% in Gaeltacht schools were in such classes, reflecting the smaller average enrolments in the latter. Average class sizes for single and multi-grade Sixth classes in SLG were 26.0 and 26.6, respectively. In Gaeltacht schools, average class size in Sixth class was 18.8 in multi-grade classes, and 22.1 in single-grade classes. Whereas single grade Sixth classes in SLG had a similar average size (26.0) to single-grade Sixth classes in NA '09 (25.9), multi-grade classes in SLG were somewhat larger (26.6 compared with 23.4 in NA '09).

Teachers in Gaeltacht schools had significantly more teaching experience on average than teachers in SLG. At Second class, the difference was about ten years, and at Sixth class, it was almost eight years. Fifty-two percent of pupils in Second class and 38% in Sixth class in SLG were taught by teachers who had not attended any professional development in English or mathematics in the previous three years. The corresponding estimates for Gaeltacht schools were 41% and 28%, respectively. Aspects of English identified by teachers of Sixth class pupils as priorities for CPD included teaching the writing process, oral language development, ICTs (including interactive whiteboards), strategies/materials for teaching low-achieving pupils, and selection of texts and resources. In mathematics, priority topics included ICTs, developing problem-solving skills, teaching multi-grade classes, using hands-on materials and identifying learning difficulties in mathematics. CPD needs were broadly similar at Second class in both school types. As in NA '09, teachers in NAIMS reported lower confidence in using ICTs to teach English and mathematics compared with other teaching activities. Just 52% of pupils in Sixth class in SLG, and 44% in Gaeltacht schools were taught by teachers who were very confident in their ability to teach calculator usage in mathematics.

Teachers indicated that 16% of pupils in Second class and 10% in Sixth class in SLG were in receipt of learning support/resource teaching (LS/RT) for English, while estimates for mathematics were 8% for Second and 10% for Sixth. In Gaeltacht schools, 20% of pupils in Second class and 18% in Sixth class were in receipt of LS/RT for English, while 10% in Second and 11% in Sixth were in receipt of LS/RT in mathematics. Provision in SLG was similar to national (NA '09) levels, while in Gaeltacht schools, it was higher, particularly in the case of Sixth class English.

Fewer than 1% of pupils in Sixth class in Irish-medium schools were in receipt of English language support, while just 1% were in receipt of Irish language support, reflecting the low proportions of students who spoke a language other than English or Irish at home.

In SLG and Gaeltacht schools, parents of between 2% and 6% of pupils reported having attended an information evening aimed at helping their child with English or mathematics. Between 8% (Gaeltacht schools, Second and Sixth classes) and 19% (SLG, Second class) reported having attended an information meeting on helping with Irish.

A more favourable ratio of computers to pupils was found in Gaeltacht schools (13 pupils per computer in Second, 12 in Sixth) than in SLG (23 per computer at both class levels). In NA '09, the corresponding estimates were 12.4 (Second) and 12.3 (Sixth).

In SLG, 43% of pupils in Sixth class had access to a central library that was used exclusively as a school library or as a library and for some other purpose. The corresponding percentage for Gaeltacht schools was 26%. Almost 90% of pupils in both school types had access to a classroom library. In SLG schools, about 73% of books in Sixth class libraries were categorised by teachers as fiction, 17% as non-fiction and 9% as reference. The corresponding estimates for Gaeltacht schools were 65%, 21% and 14% respectively.

Three-quarters of pupils in Second class in SLG were in schools in which principals reported that reading instruction began in Irish, 17% in English, and 11% in English and Irish together. In Gaeltacht schools, each of these options occurred with equal frequency. In general, the language in which reading instruction begins (according to school principals) was not associated with achievement in English reading at Second or Sixth classes. An exception was at Sixth class in Gaeltacht schools where pupils who received initial reading instruction in English and Irish together had a significantly lower mean score than pupils who had received instruction in English reading first.

In citing challenges to the teaching of English in their schools, 60% of principals in SLG described concerns about teaching English in the bilingual context of their school, including limited opportunities for incidental learning, difficulties in providing opportunities for spoken English, attaining an appropriate balance between English and Irish, and having adequate time for English. In identifying challenges, principals in Gaeltacht schools referred to specific aspects of the English curriculum that presented problems (24%), issues specific to bilingual education (24%), lack of home supports (22%) and insufficient time (20%).

Over 60% of principals of SLG identified language as a critical challenge in teaching and learning mathematics. Principals of Gaeltacht schools cited teaching multi-grade classes (25%), lack of time/breadth of curriculum (21%), specific mathematics topics (19%), problem solving (19%), and the language of mathematics (19%) as impediments.

Teaching and learning

Teachers reported widespread use of textbooks in planning English and mathematics lessons, with greater use of textbooks than other resources in planning mathematics lessons.

Over 80% of Second class pupils in SLG were taught mathematics through Irish only, whereas at Sixth class, half of pupils were taught in Irish only. In Gaeltacht schools, about one-half of pupils at each grade level were taught mathematics through Irish only, while half were taught through a mix of Irish and English. No teachers in Irish-medium schools reported that they taught mathematics through English only. No significant differences were found in the mean mathematics scores of pupils at either Second or Sixth class who received instruction through Irish only and those who received instruction through a mix of Irish and English.

On average, pupils in Second class in SLG received 48 minutes per day of instruction in English, and 46 minutes in mathematics, while their counterparts in Gaeltacht schools received 43 minutes of English and 42 of mathematics. In both school types, average times exceed those specified in the Primary School Curriculum (42 minutes for English where it is not the medium of instruction, and 36 minutes for mathematics). Pupils in Sixth class in SLG received an average of 48 minutes of instruction in English per day and 54 in mathematics, while their counterparts in Gaeltacht schools received 50 minutes in English and 51 minutes in mathematics. One-tenth of pupils in Sixth class in Gaeltacht schools and one-fifth in SLG received less than the recommended 42 minutes for English.

In Second and Sixth classes, use of interactive whiteboards (IWBs) and digital projectors was greater in English and mathematics lessons in SLG, compared with Gaeltacht schools, which, in turn, had higher usage levels than schools in NA '09. At Second class, computer usage was broadly similar in SLG and in Gaeltacht schools whereas at Sixth class, there was somewhat more frequent usage in Gaeltacht schools than in SLG. Thirty-six percent in Second class and 45% in Sixth class in SLG rarely or never used computers in mathematics classes. The corresponding figures for Gaeltacht schools are 20% and 23% respectively. Where computers were used in Sixth class mathematics classes, pupils were more likely to practice mathematical facts and basic skills, or learn mathematics concepts, rather than engage in non-routine problem solving, higher-level thinking, or handling data (graphs and tables). ICTs such as computers and IWBs were used more often to teach English and mathematics when they were available in pupils' classrooms rather than in a central location such as a computer room.

About half of Sixth class pupils were in classrooms where teachers reported at least weekly use of calculators in mathematics lessons. A minority at this class level (15% in SLG, 9% in Gaeltacht schools) were in classrooms where teachers reported that calculators were rarely or never used. The corresponding estimate in NA '09 was 22%.

The dominant modes of instruction in English and mathematics lessons in Irish-medium schools at both Second and Sixth classes were whole-class teaching and individual independent work. There was considerably less emphasis on small-group and pair work – a finding that is consistent with NA '09.

According to principal teachers, standardised tests in both English reading and mathematics were administered to 95% of pupils in SLG and Gaeltacht schools at least annually. As in NA '09, use of standardised tests to identify pupils with learning difficulties was almost universal, but between two-fifths (Gaeltacht) and one-half (SLG) of pupils were in schools where results were not used to provide feedback to pupils. Teachers reported that teacher questioning was the most widely-used form of non-

standardised assessment for English reading and mathematics. Error analysis was also quite widely used to assess English reading (80% of Sixth class pupils were in classrooms where it was used monthly) and mathematics (50%). Pupil self-assessment of English reading was implemented at least monthly in the Sixth classes of about one-half of pupils in SLG and Gaeltacht schools. Less frequent use was made of other forms of teacher assessment such as reflective portfolios, published progress tests or checklists, curriculum profiles or diagnostic tests.

Understanding performance

Drawing on data from NA '09 about the relationship between socioeconomic status and achievement at school level, the expected school-level average scores in English reading and mathematics of pupils in SLG[2] were estimated and compared with the corresponding observed scores. In the case of English reading in Sixth class (in schools with at least 15 completed Sixth class reading tests), expected average school achievement (263.2, predicted on the basis of school average SES) was similar to observed average achievement (265.2). In the case of mathematics, however, the predicted score (264.5) was well above the observed score (251.8). This can be interpreted as indicating that, on average, SLG do not do as well as expected in mathematics, given their average SES. This may reflect a weaker relationship between SES and mathematics achievement (compared to reading achievement). It may also indicate that the association is mediated by language of instruction, the nature of instruction, the language of the test, or some other factors.

In Irish-medium schools, the proportion of variance in achievement that is between schools is lower for English reading than for mathematics at both Second and Sixth classes. At Second class, the between-school variance in English reading is 8% in SLG, 6% in Gaeltacht schools, and 15% in NA '09 schools. At Sixth class, the corresponding figures are 7%, 6% and 16%. In mathematics, between-school variance in Second class is 25% in SLG, 16% in Gaeltacht schools and 22% in NA '09 schools, while in Sixth class the figures are 17%, 15% and 23% respectively. Low variation in achievement between schools (relative to within-school variation) is indicative of homogenous performance across schools. Hence, in the current study, schools are more similar to one another with respect to achievement in English reading than in mathematics.

A multilevel model of English reading achievement in Second class in SLG (where 8% of the variance was between schools) indicated that just one school level characteristic – enrolment in First class (a proxy for school size) – had a significant association with achievement once pupil-level characteristics had been controlled for. Higher pupil achievement was associated with larger enrolment size. At the pupil level, there were statistically significant positive associations between a number of variables and English reading, including pupil SES, number of books in the home, and spending time on leisure reading. Variables that had significant but *negative* associations with achievement were spending longer periods of time on English homework and having a television in a pupil's own bedroom. A key outcome of the model is the importance of home climate variables such as books at home and other educational resources, which explain additional variance in achievement over and above socioeconomic status. Overall, the model explained 67% of variance between schools and 16% within schools.

[2] It was not possible to carry out this analysis with Gaeltacht schools as an insufficient number had at least 15 pupils – the minimum number required to produce reliable estimates – in Sixth class.

Chapter 1
Context of the Study

The restoration of the Irish language has been a key policy objective of successive governments since the foundation of the State in 1921. An important strand of this policy is support for Irish as the medium of instruction in schools. In 1934, the Department of Education endorsed a resolution of the Second National Programme Conference, which required teachers to teach through the medium of Irish in infant classes in all schools, and to teach history, geography, singing and physical education through Irish in other classes. More recently, policy in relation to bilingual education has been to support instruction through the medium of Irish in schools in Gaeltacht areas ('Gaeltacht schools'), and in Irish-medium schools outside the Gaeltacht ['Scoileanna Lán-Ghaeilge' (SLG) or Gaelscoileanna] where parents and communities wish their children to be taught through Irish. Policy documents such as the *Government Statement on the Irish Language* (Government of Ireland, 2006) and the *20-year Strategy for the Irish Language 2010-2030* (Government of Ireland, 2010)[1] indicate continuing support for education through the medium of Irish at pre-school, primary and post-primary levels. The Education Act (1998) refers to the special role of Gaeltacht schools 'in contributing to the maintenance of Irish as the primary community language' (Government of Ireland, 1998, Section 9h).

Not surprisingly, given such expectations, there has been ongoing interest in standards of achievement in schools in which Irish is the main medium of instruction. In a landmark study on the effects of bilingual education, which predates the establishment of most SLG, Macnamara (1966) found that the teaching of arithmetic through Irish to native English speakers resulted in lower levels of mathematical problem solving but not mental arithmetic among Fifth class pupils, leading him to conclude that use of a bilingual's weaker language as a language of instruction may contribute to underperformance. Macnamara's finding was later challenged by Cummins (1977a), who argued that, because the study compared the performance of L1 students (i.e. native English speakers) on an English version of a problem solving test with that of L2 students (i.e. native English speakers learning mathematics through Irish) on an Irish version, competence in mathematics may have been confounded with competence to demonstrate ability when tested through the weaker language (Irish).

Macnamara (1966) also reported that the English reading performance of native-speakers of Irish (pupils in Gaeltacht schools) in Fifth class was behind that of native-speakers of English born in Ireland by 13 months of English reading age, and behind that of pupils in Britain by some 30 months.

Since Macnamara's study, several international studies have provided evidence for the benefits of bilingual and immersion education, especially full immersion in the Canadian French context (e.g., Genessee, 1987; Lambert, Genessee, Holobow & Chartrand, 1993). In such studies, students in immersion programmes often lag behind in English reading in the early primary grades, but catch up and surpass matched comparison groups by the end of primary schooling. In Ireland, a

[1] The current Fine Gael-Labour coalition backed the 20-year plan in its joint programme: *Towards Recovery: Programme for a National Government 2011-2016* (March, 2011).

national assessment in 1988 indicated that pupils in SLG outperformed their counterparts in 'Ordinary schools' (i.e., schools teaching through the medium of English) by about one-third of a standard deviation on a test of English reading.

More recently, debate in Ireland has centred on issues such as full vs. partial immersion in the early years of Irish-medium schooling (e.g., Ó hAiniféin, 2008), and whether initial reading instruction should be in Irish or English (Ní Bhaoill & Ó Duibhir, 2004).

The remainder of this chapter is divided into four sections. First, growth in school and pupil numbers in Irish-medium schools over the past decade is described. Second, the current study is situated in the context of earlier national assessments involving Irish-medium primary schools. Third, research on the effects of bilingual education on achievement and related constructs is reviewed. Fourth, factors associated with academic performance in schools in general as well as in Irish-medium schools are considered.

Irish-Medium Education

There has been considerable growth in the number of SLG in recent years. Data provided by the Department of Education and Skills (DES) indicate that there were 105 SLG in 1999-2000, and 137 in 2009-10 (personal communication, Nov., 2011). According to Gaelscoileanna (2011), in 2010-11, there were 139 SLG serving 29,733 pupils, who were taught by 1527 full-time and 95 part-time teachers. The DES Statistical Report for 2009-10 (DES, 2011b, Table 2.19) indicates that there were 103 schools in Gaeltacht areas teaching all subjects (except English) through the medium of Irish, and that these schools had a combined enrolment of 7236 pupils in 367 classes. However, unlike SLG, there has been relatively little growth in the numbers of Gaeltacht schools, though pupil numbers have risen a little. For example, in 2000-01, there were 105 Gaeltacht schools teaching all subjects (except English) through Irish, and 7181 pupils were enrolled (DES, 2002, Table 2.19).

Irish-medium education faces a number of significant challenges. One relates to the competency of teachers to teach through the medium of Irish. Ó Duibhir (2006) drew attention to weaknesses in the preparation and ongoing professional development of teachers that have implications for the Colleges of Education and for inservice providers. Among his recommendations were:

- The provision of courses in the Colleges of Education on teaching through the medium of Irish.
- The development of a support structure for the professional development of teachers in SLG and Gaeltacht schools.
- The provision of opportunities for, and incentives to, teachers in SLG and Gaeltacht schools to improve their standard of Irish.

Another significant challenge facing SLG in particular concerns accommodation, with some schools in temporary premises for several years before securing permanent accommodation.

According to MacDonnacha et al. (2005), the main challenges facing Gaeltacht schools include:

- *Diverse enrolment.* Twenty-six percent of pupils attending Gaeltacht primary schools in their study were born or lived outside the Gaeltacht prior to attending school

there, while 9% (attending 33 schools) lived outside the Gaeltacht, while attending school.

- *Size*. Most Gaeltacht schools are small, making it difficult to deal with a wide range of linguistic and other abilities
- *Support services*. Gaeltacht schools may not have access to Irish-medium support services or psychological support services.

MacDonnacha et al. (2005) proposed that Gaeltacht schools be identified on the basis of the educational model they adhered to: (i) a first-language education model, with Irish as the medium of instruction; (ii) an immersion model, with Irish as the medium of instruction; and (iii) a first-language education model, with English as the medium of instruction. It is not clear how this proposal would operate in practice – for example, who would decide which category a school fell into? What role would parents have in this? Would parents choose to send their children to the school whose model they favoured and how would geographic considerations affect this?

A context against which to benchmark the growth of Irish-medium schools in Ireland is Wales. In 2009, 438 primary schools in Wales (29%) were classified as being Welsh-medium, with 21% of primary school children enrolled in classes in which Welsh was the main medium of instruction (Welsh Assembly Government, 2010). The percentage of Welsh-medium learners has increased from 17.7% in 1999. Welsh-medium schools are expected to 'provide as much provision through the medium of Welsh as is necessary for learners to achieve fluency in the two languages [English and Welsh]' (ibid., p. 9). The Welsh model is based on parental demand, with local education authorities expected to plan for future increases in demand.

Gaelic-medium education is less widespread in Scotland, although there has been an increase at primary level from 24 pupils in 1985 to 2312 in 2010. The majority of these pupils are enrolled in Gaelic-medium units within English-medium schools and represent fewer than 1% of primary-level students in Scotland (Bòrd Na Gàidhlig, 2011).

Earlier National Assessments

The (now) Department of Education and Skills has overseen national assessments of achievement in primary schools since the early 1970s. Most of these, including the 2009 National Assessments of Mathematics and English Reading (NA '09), have been based on representative national samples that have included pupils in Irish-medium schools. In general, the numbers of Irish-medium schools and pupils in these studies have been small (i.e., in proportion to their representation in the target population), and hence, it has not been possible to report separate results for SLG and Gaeltacht schools. An exception has been those studies that have specifically targeted Irish-medium schools only, or a combination of Irish-medium and 'Ordinary' schools (see Table 1.1).

Table 1.1: Earlier national assessments involving samples of pupils in Irish-medium schools

Year	Domain(s)	Target Group(s)	Report
1982	Oral Irish	Second class	Harris (1984)
1985	Oral Irish	Sixth class	Harris & Murtagh (1987, 1988)
1988	English reading	Fifth class	Dept. of Education (1991)
2002	Oral Irish, Irish reading	Sixth class	Harris et al. (2006)

The 1988 National Assessment of English Reading is particularly relevant here because it included a sample of pupils in Fifth class in 'Ordinary' schools and all pupils in Fifth class in SLG. A standardised test of reading achievement, the D88, comprising 80 multiple-choice questions, was administered to both groups. Table 1.2 shows that the mean score for pupils in Ordinary Schools was 59.2, while that for pupils in SLG was 66.1. The difference was reported as being statistically significant. The difference in achievement in favour of pupils in SLG (6.94) approaches one-half of a standard deviation. Differences between boys and girls in both Ordinary schools and SLG are too small to reach statistical significance.

Table 1.2: Mean raw scores on the D88 Reading Test in Fifth class in the 1988 National Survey of English Reading in Primary Schools – Ordinary schools and SLG, by gender

	Ordinary Schools			SLG		
	Boys	Girls	All	Boys	Girls	All
Mean	59.34	58.96	59.15	65.48	66.79	66.09
St. Dev.	16.01	14.20	15.11	12.36	10.28	11.40
N	820	816	1636	256	220	476

Source: Dept. of Education (1991), Table 6, page 16. N (Ordinary Schools) = 1636; N (SLG) = 476.

It is of interest to note the large differences in the 1988 study in favour of SLG pupils at the 10th, 20th, 30th and 40th percentile ranks (Table 1.3). For example, pupils in SLG who scored at the 20th percentile (i.e., lower-achieving students) had a score that was 11 score points (almost a standard deviation) higher than that of similar pupils in Ordinary schools. Such large differences are not apparent at the upper end of the achievement distribution, with just 2 score points separating pupils in the two school types at the 90th percentile. This may have arisen because of a ceiling effect on the test, meaning that the test may not have discriminated very well among the highest-achieving pupils because it was relatively easy for them.

Table 1.3: Distributions of scores on the D88 Reading Test in Fifth class in the 1988 National Survey of [English] Reading in Primary Schools – Ordinary schools and SLG

Ordinary Schools		SLG	
Percentile	Raw Score	Percentile	Raw Score
10	36	10	50
20	46	20	57
30	53	30	63
40	58	40	66
50	63	50	70
60	67	60	72
70	70	70	74
80	73	80	76
90	75	90	77

Source: Dept. of Education (1991), Table 5, page 15. N (Ordinary Schools) = 1636; N (SLGs) = 476.

In interpreting the stronger overall performance in English reading of SLG pupils, the report (Dept. of Education, 1991) pointed to a study showing that parents of pupils in Dublin SLG were more strongly represented among professional/high administrative, managerial, executive inspectional/supervisory occupations than the Dublin adult average, and had higher levels of education (O'Riagáin & O'Gliasáin, 1979), and that students in SLGs had higher performance on a measure of verbal and numerical reasoning than pupils in Ordinary and Gaeltacht schools (Harris & Murtagh, 1987). Reference was also made to a more favourable teacher-pupil ratio in SLG as a

possible contributing factor. However, no direct measure of socioeconomic status was obtained in the study and hence SES could not be linked directly to reading performance. The study did not provide separate data on the performance of pupils in Gaeltacht schools.

In 2002, the Department of Education and Science commissioned a national assessment of oral Irish and Irish reading in Sixth class in SLG, Gaeltacht schools, and Ordinary schools. On a 25-item multiple-choice test of reading comprehension, administered to all three samples, pupils in SLG achieved a significantly higher mean percent-correct score (85%) than their counterparts in Gaeltacht schools (71%) and Ordinary schools (39%)[2] (Harris et al., 2006) (Table 1.4). On a 90-item reading comprehension test that included multiple-choice and written response items, which was administered to pupils in Irish-medium schools only, SLG pupils achieved a mean score that was significantly higher, by over one-third of a standard deviation, than that of their counterparts in Gaeltacht schools.

Table 1.4: Mean percent correct scores of pupils in SLG, Gaeltacht schools and Ordinary schools on the Common Test of Irish Reading (2002)

School Type	Mean Score (%)	Standard Error of the Mean
SLG	85.0	1.24
Gaeltacht Schools	70.9	2.86
Ordinary Schools	38.9	0.87

Source: Harris et al. (2006), Table 5.1 (p. 83) and Table 5.4 (p. 85).

A broadly similar set of outcomes was obtained on criterion-referenced tests of listening and speaking in Sixth classes in the same study. Again, SLG pupils outperformed their counterparts in Gaeltacht schools, who, in turn, outperformed pupils in Ordinary schools, with Gaeltacht schools closer to SLG than to Ordinary schools (Harris et al., 2006). Furthermore, whereas performance on Irish listening and speaking skills was found to have declined to a significant extent in Ordinary schools between 1985 and 2002, performance was stable between those years in SLG, and declined significantly on speaking but not listening in Gaeltacht schools.

2009 National Assessments of Mathematics and English Reading

The most recent national assessments involving primary-level pupils were implemented in 2009, and involved administering tests of English reading and mathematics in Second and Sixth classes (Eivers et al., 2010a, 2010b). As 2009 was the first year that these class levels were included in a national assessment, it was not possible to establish direct links with earlier national assessments. The value of the 2009 study in the context of the current study is that it allows for a comparison of performance in reading and mathematics of pupils in SLG and Gaeltacht schools with the performance of pupils in 'Ordinary'[3] schools, not only in terms of achievement, but also with respect to characteristics of schools, classrooms and pupils. The instruments used in NA '09, and adjustments made to them for the current study, are described in Chapter 2, and relevant comparisons between the two studies are drawn throughout the remainder of this report.

[2] The 2002 Study of Irish in Primary Schools sampled *all* Gaeltacht schools (including those where some subjects were taught through English); the focus of the current study is on Gaeltacht (and SLG) schools in which Irish is the medium of instruction.

[3] Fewer than 5% of schools in the 2009 national assessments were drawn from the Irish-medium sector, and the outcomes for all schools in the assessments are almost identical to those for Ordinary schools. Further detail is provided in Chapter 2.

Stability of Assessment Outcomes

A feature of national assessments in Irish, English reading and mathematics at primary level has been the stability of outcomes. While performance on English reading in Fifth class improved between 1972 and 1980 (Mulrooney, 1986), performance in that domain has been stable between 1980 and 2004. Similarly, no changes in mathematics performance in Fourth class were recorded between 1999 and 2004. As noted above, no inferences about trends in performance could be made on the basis of the outcomes of NA '09.

The results of an international assessment, the OECD Programme for International Student Assessment (PISA 2009), which were published in December 2010, indicated that performance among 15-year-olds in Ireland on English reading literacy had declined by one third of a standard deviation since 2000, while performance in mathematics had declined by one-sixth of a standard deviation since 2003 (OECD, 2010). In both domains, most of the decline occurred between 2006 and 2009. It is unclear at this time whether the declines observed in PISA are real, or are artefacts of the PISA scaling process, or arise from low levels of student effort (Perkins et al., 2012 for a discussion on this). It is also unclear if the disappointing performance on PISA 2009 can be traced back to a decline at primary level, though this seems unlikely as students in PISA 2009 were drawn from cohorts that participated in the 2004 national assessments of English reading in Fifth class and mathematics in Fourth class, and no overall declines were reported in 2004 compared with earlier assessments at the same class levels in 1998 (English reading) and 1999 (mathematics) (Eivers et al., 2005; Shiel et al., 2006).

A consistent feature of earlier PISA assessments has been the strong performance of students in Ireland on reading literacy (Ireland ranked 5th among participating countries in 2000), and a relatively disappointing performance in mathematics (Ireland ranked 18th among participating countries in 2003), especially among higher-achieving students. It is unclear why there continues to be a large difference between the performance of students in Ireland on reading literacy and mathematics in PISA, though low performance on PISA mathematics may relate to differences between Junior Certificate mathematics and PISA mathematics (see Close, 2006).

Effects of Bilingual Education

The release of Circular 0044/2007 (DES, 2007), which directed Irish-medium schools to allocate 30 minutes per day to the teaching of English from the second term of Junior Infants onwards[4], focused attention on effects of immersion, particularly in SLG. However, the issue of whether reading instruction should begin in Irish or in English was being debated well before that time.

The Revised Primary School Curriculum (DES/NCCA, 1999a, 1999b, 1999c) does not offer explicit guidelines for Irish-medium schools on the language in which reading instruction should commence. The curriculum notes only that reading should not commence in both languages simultaneously. The order in which reading instruction in English and Irish begins varies across Irish-medium schools. According to Ní Bhaoill and Ó Duibhir (2004), 58% of Irish-medium schools began formal reading instruction in

[4] As noted in the Preface, the circular was withdrawn by the Department of Education and Science in January, 2010.

Irish, 36% began in English, and the remainder began in both languages at the same time. We do not know if these figures reflect the current situation.

Ó hAiniféin (2008) is critical of the fact that, while the Primary School Curriculum provides separate curricula for Irish for schools in which Irish is the medium of instruction, the curriculum advocates a 'one size fits all' approach for English. It is unclear what a separate English programme for Irish-medium schools might look like, given the sometimes pervasive influence of English outside of the school environment. Ó hAiniféin also notes that, while 'literacy' is mentioned specifically in relation to the content of the English curriculum, it is not mentioned in relation to content in Irish, except in the context of teacher guidelines.

In a cross-sectional study involving 254 pupils in Senior Infants, Second and Fourth classes, Parsons and Lyddy (2009) studied the effects of learning to read in English or Irish in four schools: a Gaeltacht school, an Irish reading first (IRF) Scoil Lán-Ghaeilge, an English Reading First (ERF) Scoil Lán-Ghaeilge, and a school in which English was the medium of instruction. Parallel measures of letter sounds, non-word reading, and word reading in both English and Irish were administered in the four schools. The outcomes (summarised in Table 1.5) show initial low average performance among pupils in the Gaeltacht school on letter sounds, non-word reading and real word reading in both English and Irish, with pupils in such schools catching up by Second class in the case of Irish and English sounds, and by Fourth class in the case of English word reading (real and non-word). The outcomes also show that although the IRF group struggled relative to the ERF on English word reading in Senior Infants, they performed at a similar level in Second class. Similarly, while the ERF group struggled in both Senior Infants and Second class on Irish word reading, they caught up by Fourth class.

There are difficulties in generalising from the outcomes of this study to Irish-medium schools in general as the sample size is small. Furthermore, pupils reached a ceiling level on some of the instruments by Fourth class, perhaps masking lingering effects that might be picked up on measures with broader ranges of scores or a somewhat different focus (e.g., reading comprehension). Nevertheless, the outcomes are important in the context of the current study in that they suggest that pupils in Gaeltacht schools and in SLG where instruction is in Irish reading first will not be at an undue disadvantage on English reading by Fourth class.

In a study of reading and mathematics in rural schools participating in the School Support Programme (SSP) under DEIS, Weir, Archer and Millar (2009) found that pupils in Gaeltacht SSP rural schools achieved significantly lower mean scores on tests of reading but not mathematics in Third and Sixth classes, compared with pupils in non-Gaeltacht rural SSP schools. However, differences in reading were quite small (about one-seventh of a standard deviation at both class levels) and are unlikely to be of substantive significance.

According to Ó Laoire and Harris (2006), the different strategies used by schools in introducing reading (i.e., IRF, ERF) may reflect the optimum response at individual school level to different educational, social and linguistic circumstances. They argue that there is no reason why best practice in this area should be the same in all SLG. Others (e.g., Ó hAiniféin, 2008) take the view that Irish immersion is essential in the early years of schooling. An implication of this view is that formal reading instruction in all Irish-medium schools should begin in Irish before moving on to English.

Table 1.5: Summary of outcomes of Parsons and Lyddy (2009)

Test	Senior Infants	Second	Fourth	Comment
Irish letter sound knowledge	IRF significantly ahead of other three groups	IRF, ERF & Gaeltacht groups similar, and all significantly higher than English-medium	Children from IRF, ERF and Gaeltacht schools close to ceiling and significantly ahead of English-medium.	Gaeltacht and ERF groups caught up with IRF group by Second class. ERF overcame disadvantage relative to IRF by Second.
English letter sound knowledge	Gaeltacht children identified fewer letter sounds than children in the other three groups, which were similar to one another.	No significant differences among the four groups.	Outcomes as per Second class, and close to ceiling.	Gaeltacht children caught up by Second class.
Irish non-word reading	IRF significantly ahead of the other three groups; Gaeltacht children performed poorest. Performance similar among English-medium and ERF groups.	IRF, ERF and Gaeltacht groups significantly outperform the English-medium group.	Performance of IRF, ERF and Gaeltacht groups were similar, while English-medium group did least well, though the gap was smaller than in Second.	Gaeltacht and ERF groups caught up with IRF group by Second class; English-medium group continued to perform poorly across class levels.
English non-word reading	IRF, ERF and English-medium groups significantly outperformed Gaeltacht group. No differences among IRF, ERF and English-medium groups.	Gaeltacht group scored significantly below the other groups, which were not different from one another.	No differences among any of the groups.	Initial disadvantage for Gaeltacht schools had been resolved.
Irish word reading	IRF, ERF scored at a similar level; both were significantly ahead of Gaeltacht and English-medium students, with the latter all scoring in the non-reading range (below 10%).	IRF significantly ahead of ERF and Gaeltacht groups, and all performed significantly better than the English-medium group.	IRF, ERF and Gaeltacht groups scored at a similar level to one another, and all were significantly higher than English-medium group	Again, initial disadvantage for Gaeltacht group was resolved by Second class, while initial difference in favour of IRF over ERF was resolved by Fourth class.
English word reading	ERF and English-medium groups ahead IRF and Gaeltacht groups, while the IRF group was ahead of the Gaeltacht group.	Mean scores of ERF, IRF and English-medium groups significantly ahead of Gaeltacht group.	No significant differences among the four groups.	Initial disadvantage of IRF group resolved by Second, and disadvantage of Gaeltacht group by Fourth.
Irish vocabulary	Gaeltacht group ahead of other groups. English-medium scored significantly lower than ERF, IRF groups, which were similar to one another.	Identical outcome to Senior Infants.	IRF, ERF and Gaeltacht groups were similar to one another, and outperformed the English-medium group.	Irish-medium groups caught up with Gaeltacht group by 4th class. Authors suggest performance of Gaeltacht group (including pupils who didn't speak Gaeilge at home), may be a result of a strong focus in school on oral language.
English vocabulary	No significant differences among groups.	ERF, IRF and English-medium groups were similar, and all were ahead of Gaeltacht group.	No significant difference among the four groups.	Authors suggest that weaker performance of Gaeltacht group at Second class may be cohort effect.
Irish orthographic sensitivity	Performance of all groups at 'chance' level.	ERF and IRF groups ahead of English-medium and Gaeltacht groups.	ERF, IRF and Gaeltacht groups significantly ahead of English-medium group.	Gaeltacht group's disadvantage at Second class resolved by Fourth.
English orthographic sensitivity	Performance of all groups at 'chance' level.	IRF and ERF significantly higher than Gaeltacht group.	No differences across groups.	Gaeltacht group's disadvantage at Second class again resolved.

In considering arguments in favour of full immersion, and beginning reading instruction in Irish, it is relevant to note that pupils may acquire skills in English

reading, either at home, in the community, or through the media, and that formal and informal learning of English outside of the school context may contribute to development of reading skills in Irish as well as English. Indeed Cummins (1979) noted that when the use of L1 (first language, e.g., English) is promoted by the child's linguistic environment outside the school, a high level of L2 achievement (second language, e.g., Irish) is also likely to occur at no cost to L1 competence (Cummins' 'developmental interdependence' hypothesis). Cummins adds that L1 and L2 skills may operate in a mutually reinforcing or interdependent manner, with high levels of proficiency in L1 supporting development in L2 and vice versa (his 'common underlying proficiency' hypothesis).

In a qualitative study of the language samples of three groups of primary (Fifth class, mixed SES) pupils in an SLG engaging in mathematical problem solving, Ryan (2011) found that the immersion context had little negative effect on the comprehension of questions or on the communicative ability of the children. While mathematical terminology was not widely used, general language was used to express the mathematical ideas. Ryan concluded that 'the immersion setting does not confer any particular disadvantage on mathematical problem solving' (p. 377), though she did raise concerns about the difficulties experienced by some pupils in articulating higher-order concepts and reasoning processes, and suggested that the pupils in her study would benefit from acquiring and using more mathematical terms and a more specifically mathematical register as they engage in word problems. A key issue here is whether the outcomes of Ryan's study translate to a paper-and-pencil test such as that administered in NAIMS, where pupils cannot benefit from group participation, and limited time is available for solving problems.

In a small-scale study involving pupils who had studied mathematics through Irish in Irish-medium primary schools, and had transferred to English-medium secondary schools, Ní Ríordáin and O'Donoghue (2009) (also, Ní Riordáin, 2011) reported that pupils' performance on problem solving items in Irish was significantly ahead of their performance on similar items in English. The researchers also found that overall performance on mathematical problem solving among pupils who had attended Irish-medium schools was higher than that of pupils in a comparison group who had attended English-medium primary schools. Finally, they identified pupils who had low proficiency in both English and Gaeilge as being particularly at risk of low performance on mathematical problem solving.

Canadian Research on Effects of Bilingual Education on Achievement

A large body of research has supported the acquisition of L1 skills when children are immersed in an L2 environment. Here, research from Canada is considered, as bilingual education in French immersion schools in Canada has the same broad goals as SLG in Ireland – that is, the development of high level of proficiency in L2 while also developing L1 skills. Noteworthy studies conducted in Canada and key findings include:

- Lambert and Tucker (1972) – in Grade 1, immersion children scored significantly lower in English literacy skills, compared with children instructed in English-medium classes. However, the lag had disappeared by the end of Grade 2, when English instruction had set in. The oral language of immersion students did not fall behind at any level.
- Genessee and Stanley (1976) – no significant differences in English composition (writing) were observed between immersion students and English programme

students. Genesee (1979) reported high correlations between L1 and L2 reading skills, and concluded that proficiency is most likely transferred from one language to the other.

- Swain and Lapkin (1982) – whereas immersion students in Toronto and Ottawa had lower English literacy skills than monolingual students in the first two years, differences disappeared as soon as English language arts was officially introduced into the curriculum in Grade 3. Their longitudinal study also showed that, by Grade 5, immersion students outperformed English-only programme students in some aspects of English language skills. Swain and Lapkin also reported that immersion students performed at a comparable level to English-only students in mathematics by Grade 5.
- Reeder, Buntain and Takakuwa (1999) – the effect of increased use of French in an early immersion programme in Vancouver was found not to lead to significant differences in English writing skills.
- Turnbull, Lapkin and Hart (2001) – Grade 3 French immersion pupils performed at a comparable level with English programme pupils in English reading and writing. By Grade 6, immersion pupils outperformed the regular programme pupils in all skill areas.
- Bournot-Trites and Reeder (2001) – Grade 6 pupils who were enrolled in an 80% French immersion programme (with mathematics taught through French) outperformed students enrolled in a 50% French programme (with mathematics taught through English) in mathematics at the end of Grade 6. De Courcy and Burston (2000) reported similar results for French immersion in Australia.

This body of research supports the view that bilingual education can have beneficial effects on pupils' performance in reading on both L1 and L2. Moreover, other aspects of curriculum such as mathematics and writing may not be affected in a negative way. However, research on the effects of bilingualism in Canada have been criticised along the following lines:

- *Self-selected samples*. The studies involve voluntary programmes in which parents wanted their children to learn French, and the children in the studies were generally upper middle class, not disadvantaged. According to Slavin and Cheung (2003), '[children] who do not thrive could be and were routinely returned to English-only instruction . . . children who complete French immersion programmes in Canada are self-selected, relatively high achievers' (p. 17). In seeking to remedy this, Slavin and Cheung suggest that (a) large numbers of children should be randomly assigned to be taught in their first (L1) or second (L2) languages; and (b) the children should be pretested in their native language when they begin to be taught differently.
- *Inadequate control groups*. Slavin and Cheung questioned the value of control groups used in some bilingual studies, noting that, 'in many studies, English comparison groups were not learning French at all' (p. 18).
- *Publication bias*. At a more general level, Slavin and Cheung noted that bilingual studies showing no differences between groups are less likely to be published or otherwise come to light. They refer to this as the 'file drawer' problem and note that it is a particular problem when one tries to draw conclusions based on 'best evidence' or a series of studies.

Research on Other Cognitive Outcomes of Bilingual Education

Thus far, we have considered effects of bilingual education as they relate to achievement in language and mathematics. In this section, research on other benefits of bilingual education are considered. In a meta-analysis by Adesope, Lavin, Thompson and Ungerleider (2010) that synthesised the outcomes of 63 studies (all involving 'balanced' bilinguals), positive overall effects of bilingualism were found on a range of cognitive measures:

- *Metalinguistic awareness* – bilingual learners had a greater awareness of linguistic forms and structures across two languages and greater insights into how language works.
- *Metacognitive awareness* – bilinguals had a better understanding of their own learning strategies and the mental activities required to self-regulate the learning process.
- *Abstract and symbolic reasoning* – bilinguals had stronger abstract reasoning skills and a higher awareness that relationships between words and objects are arbitrary.
- *Attentional control* – bilinguals were more readily able to control their attention when engaged in linguistic and non-verbal tasks, compared to monolinguals.
- *Problem solving* – bilinguals showed stronger evidence of enhanced performance on tasks requiring executive control (i.e., planning, cognitive flexibility, abstract thinking, rule acquisition, initiating appropriate actions, inhibiting inappropriate responses, and selecting relevant sensory information).

Many of these skills are hypothesised to arise from dealing with two languages at the same time. This, it seems, can lead to the development of high levels of cognitive flexibility. Importantly, Adesope et al.'s (2010) findings relate to effects of bilingual programmes in both the US and Canada – countries in which the objectives of bilingual education are often quite different. In Canada, the focus is often on immersion in French, while in the US it is on integration into mainstream English language programmes, with bilingual programmes being viewed as transitional.

Factors Associated with Achievement in Reading and Mathematics

In this section, a selection of factors identified in earlier research studies as being associated with reading and mathematics achievement are described. Where available, evidence of associations between such factors (e.g., socioeconomic status, gender) and the achievements of pupils in Irish-medium schools is referred to.

Socioeconomic Status

There is strong evidence in the research of an association between socioeconomic status and achievement in reading and mathematics. Here in Ireland, studies of English reading and mathematics in primary schools (Eivers et al., 2005; Eivers et al., 2010a) confirm that as socioeconomic status (typically based on parents' occupations and/or their educational levels) increases, so does achievement in English reading and mathematics. Hence, on average, pupils with higher socioeconomic status perform better on reading and mathematics than pupils with lower socioeconomic status.

Hierarchical multi-level models of achievement confirm the importance of socio-economic status, after controlling for other relevant variables (such as educational resources in the home and frequency of reading for enjoyment). A key finding of such research is that the combined socioeconomic status of other students in a school has an important effect on an individual's achievement in reading, in

addition to the student's own socio-economic status. A study by Sofroniou, Archer and Weir (2004), which also used multi-level modelling, confirmed the existence of a social context effect (that is, the effect of the presence of increasing densities of students from disadvantaged backgrounds) in primary and post-primary schools, and reported that the effect was greater (more negative) for boys than for girls in the case of mathematics at primary level, and for boys in both English and mathematics at post-primary level. This research is relevant to the current study in terms of seeking to quantify the contribution of school- and pupil-level socioeconomic status to achievement across different school types.

The work of Harris et al. (2006) in describing factors associated with performance in Irish listening, speaking and reading across SLG, Gaeltacht schools and Ordinary schools is also important in this regard. Results for Irish reading by parents' highest level of education are summarised in Table 1.7. It should be noted that the same test was administered to pupils in SLG and Gaeltacht schools, and a different (easier) test was given to pupils in Ordinary schools. The table shows that the parent education profiles are similar for Gaeltacht and Ordinary schools. However, in the case of SLG, despite a higher level of missing data, almost twice as many families reported having at least one parent with a third-level degree. Conversely, compared with SLG, over twice as many parents of pupils in Gaeltacht and Ordinary schools reported a level of education at or below Junior Certificate. The table also shows that, in broad terms, pupil performance increases in line with parent education within each school type. Finally, given that scores for SLG and Gaeltacht schools are comparable, it is clear that levels of performance in Gaeltacht schools are lower than those of SLG across all parent education levels, and for missing/other.

Table 1.6: Irish reading performance in Sixth class by school type and parents' level of education (2002)

	SLG		Gaeltacht		Ordinary	
	% in Category	Mean Score	% in Category	Mean Score	% in Category	Mean Score
Primary/Group/Inter/Junior Cert	12.2	231.0	32.4	214.5	28.5	234.3
Leaving Cert	24.9	261.1	29.9	230.5	27.1	256.3
Third-level Cert/Dip	18.8	267.3	15.4	223.2	18.8	259.3
Third-level Degree	29.1	279.7	13.3	254.0	13.2	277.2
Missing/Other	15.1	259.5	9.0	214.4	12.3	228.9
Total	100.0	263.8	100.0	225.9	100.0	250.0

Source: Harris et al. (2006), Tables 6.7-6.9. Scores for Ordinary schools are based on a different test to those for SLG and Gaeltacht schools.

A related issue relevant to the current study is the association between average school socioeconomic status and reading achievement. As noted earlier, Weir et al. (2009) reported that pupils in Gaeltacht rural schools in the SSP under DEIS (i.e., Gaeltacht schools with high average levels of disadvantage) achieved significantly lower mean scores on tests of English reading but not mathematics in Third and Sixth classes, compared with pupils in rural SSP schools outside of the Gaeltacht. In interpreting this finding, Weir et al. noted that the mean DEIS points score for Gaeltacht rural schools (183.4) exceeded that of non-Gaeltacht rural schools (171.5) (indicating higher levels of disadvantage among pupils attending rural Gaeltacht schools). However, they argue that if poverty is the explanation, it would have had the same effect on mathematics as on English reading (which it did not). Weir et al. did not investigate whether Gaeltacht pupils had been taught to read in English or Irish

first, whether they had learned mathematics through English or Irish, or how these practices might have varied according to average school socioeconomic status.

Finally, Harris et al. (2006) argue that a context effect operates in SLG, at least in the case of Irish. They found that pupils attending SLG who have no linguistic, social or educational advantages (such as parents who speak Irish at home, or have high levels of education) achieve at a significantly higher level in Irish than pupils in Ordinary schools who *do* enjoy such advantages. A key question is whether such an effect operates in the case of English reading and mathematics – the subjects that form the focus of the current study.

Gender

Where gender differences have been found in earlier national assessments of English reading and mathematics, they have been relatively small. In NA '09, girls in Second class achieved an overall mean reading score that was significantly higher than boys by 14 score points, or just over one-quarter of a standard deviation. At Sixth class, girls outperformed boys on overall reading by 4 score points – a difference that was not statistically significant. There were no significant gender differences on overall mathematics at either Second or Sixth class levels. At Sixth class, boys significantly outperformed girls by 9 points (just under one-fifth of a standard deviation), on the Measures content area, while a similar advantage in favour of boys on the Problem Solving process skill area was not statistically significant. No significant content or process subscale differences were observed at Second class level.

There was a gender difference of over a third of a standard deviation in favour of girls aged 15 in Ireland on the 2009 PISA assessment of reading literacy, while there was no significant gender difference in mathematics performance (Perkins et al., 2012). The difference in reading was in line with previous PISA assessments, whereas boys had significantly outperformed girls in PISA 2000, 2003 and 2006 mathematics. It is unclear to what extent differences in PISA (or indeed in the 2009 National Assessments) can be attributed to characteristics of the reading and mathematics tasks undertaken by students, or to some other factor or factors.

As noted earlier, there were no differences between boys and girls in Fifth class in SLG in the 1998 National Assessment of English reading (Tables 1.2 above). In the 2002 National Assessment of oral Irish and Irish reading in Sixth class across three school types, girls in Scoileanna-Lán Ghaeilge, Gaeltacht schools and English-medium schools significantly outperformed boys on reading. On a test administered in Irish-medium schools only, the difference was two-fifths of a standard deviation for both SLG and Gaeltacht schools. On a separate test, administered in English-medium schools only, the difference was two-thirds of a standard deviation. In English-medium schools and SLG, but not Gaeltacht schools, girls significantly outperformed boys on several listening objectives. Gender differences on speaking, again in favour of girls, were observed only in English-medium schools.

Home Educational Resources and Supports

While measures of socioeconomic status and gender can explain some differences in performance on language and mathematics tests, other factors are also involved. One such factor is home educational resources.

A common measure of home educational resources across studies, including NA '09 , is the number of books in a pupil's home (excluding schoolbooks). On average, pupils with greater numbers of books at home perform better on both

English reading and mathematics than their counterparts with fewer books. For example, in NA '09, pupils in Sixth class with 500 or more books at home achieved a mean reading score that was one and three-fifths of a standard deviation (81 points) higher than that of pupils who had between zero and 10 books (Eivers et al., 2010a). Since there are equally strong associations between number of books at home and mathematics achievement, is seems that this variable may function both as a measure of resources and as a measure of the educational atmosphere in the home – i.e., parents may model behaviours that schools seek to develop, such as engaging in silent reading, discussing what has been read, solving problems etc. Eivers et al. (2010a) found that pupils in Sixth class in homes where at least one family member belonged to a public library achieved an average reading score that was two-fifths of a standard deviation higher than that of pupils in families with no library member. In the same study, pupils who reported that they had a television in their bedroom did less well on average on both reading and mathematics than pupils who did not.

A study by Smyth et al. (2010) used multi-level modelling to examine how the relationship between socioeconomic status and English reading/mathematics among 9-year olds changed when informal (e.g., number of books in the home, children's participation in after-school cultural activities, and parents' literacy/numeracy difficulties) and formal (encouragement of child's school performance, attendance at parent-teacher meetings) educational resources were added to the models. Smyth et al. found reduced effects for socioeconomic status and maternal education when formal and informal home educational factors were added, indicating that performance was a function of both fixed social/educational factors and more malleable home educational resources.

Language Spoken at Home

In NA '09, Eivers et al. (2010a) identified the language of the home as a key factor associated with performance. In English reading, pupils in Second class who spoke English/Irish at home (90% of the sample) significantly outperformed those who spoke another language at home by three-fifths of a standard deviation. In mathematics, the gap was two-fifths of a standard deviation. At Sixth class level, pupils who spoke English/Irish at home (94%) outperformed those who spoke another language, by four-fifths of a standard deviation in reading (which was statistically significant) and by one-fifth of a standard deviation in mathematics (which was not). The 2009 PISA results for Ireland also showed significantly lower average scores in reading and mathematics for pupils who spoke a language other than English/Irish at home (Perkins et al., 2010, 2012).

In Harris et al. (2006), pupils in SLG whose parents had high levels of proficiency in spoken Irish had a higher average score on a test of Irish reading than pupils whose parents had minimal or no proficiency in Irish. In Gaeltacht schools in the study, pupils whose parents were native speakers of Irish outperformed pupils whose parents had lower levels of proficiency.

Key Points

- Until recently, there has been considerable growth in Irish-medium education. Most of this growth occurred in the SLG. According to DES data, there were 137 SLG, attended by over 25,000 pupils in 2009-10. Enrolment in Gaeltacht schools that teach all classes through the medium of Irish has been more stable, with over 7000 pupils attending 103 such schools in 2009-10. Challenges facing Irish-medium schools include small school size (many Gaeltacht schools have fewer than 100 pupils), variation in Irish language proficiency among teachers, and access difficulties with some psychological and support services through the medium of Irish.
- Earlier national assessments provide some insights into the performance of Irish-medium schools. In 1988, pupils in SLG significantly outperformed their counterparts in 'Ordinary' schools on tests of English reading. The 2009 National Assessments of Mathematics and English Reading (NA '09) is especially relevant to the current study because performance in Irish-medium schools is benchmarked against the performance of a national sample of pupils in NA '09.
- Research conducted in French-speaking parts of Canada shows that pupils attending schools which operate strong immersion policies perform well in English reading and mathematics by the end of primary schooling, even though progress in English reading may be slower in the early grades. Similar findings, arising from a small study implemented in Ireland (Parsons & Liddy, 2009) support the view that, in general, strong immersion programmes can lead to positive outcomes in both Irish and English. However, such findings need to be interpreted in a context in which many pupils may acquire English reading skills outside of school.
- Bilingual education has been shown to contribute in a positive manner to a number of non-achievement outcomes such as metalinguistic awareness, abstract and symbolic reasoning, attention control, and problem solving.
- Many factors are associated with performance in English reading and mathematics. These, however, consistently include socioeconomic status at school and pupil levels, pupil gender, home educational resources and supports, and the language spoken by pupils at home.

Chapter 2
Assessment Frameworks and Methodology

This chapter outlines the assessment frameworks and methods used in the National Assessments of English Reading and Mathematics in Irish-medium Primary Schools (NAIMS). First, the frameworks underpinning the assessments as described. Second, procedures used to sample schools and pupils are outlined. Third, instruments used are discussed. Fourth, response rates for the survey are reported. Fifth, implementation of the study is described. Sixth, methodologies used to weight, scale and analyse the data are outlined.

Assessment Frameworks and Example Items

The assessment frameworks for NAIMS are the same frameworks used in the 2009 National Assessments of Mathematics and English Reading (NA '09; Eivers et al., 2010a). The full framework documents for English reading and mathematics (ERC, 2008, 2009) provide detailed descriptions of the content areas and processes underlying the tests in these domains, while the mathematics framework also includes sample test items similar to those on the test itself. The frameworks include a rationale for the content of the School, Teacher, Parent and Pupil Questionnaires, and the Pupil Rating Form. Here, key aspects of the English reading and mathematics frameworks are summarised.

English Reading

The definition of English reading upon which the reading framework and tests are based is:

> the process of constructing meaning through the dynamic interaction among the reader's existing knowledge, the information suggested by the written language, and the context of the reading situation. Young readers read to learn, to participate in communities of readers, and for enjoyment (Eivers et al., 2010a, p. 15).

The framework for English reading defined reading comprehension along two dimensions: the purpose of the text (either literary experience or acquire & use information), and the process used to interpret it (Retrieve, Infer, Interpret & Integrate, or Evaluate).

The specifications for the test were arrived at by considering the content of the Primary School English Curriculum (PSEC) (DES/NCCA, 1999c) and the types of reading materials that pupils in Second and Sixth classes encounter. About one-half of the texts at each class involved reading for literacy experience, and one-half involved reading to acquire and use information. Retrieving information (Retrieve) and making inferences (Infer) were the main reading comprehension processes assessed in Second class, while retrieving information, making inferences, and integrating and interpreting information (Interpret & Integrate) were regarded as equally important at Sixth class. The Sixth class, but not the Second class, test also required pupils to examine and evaluate information (Evaluate). The findings of an analysis by Cosgrove et al. (2004) of texts in published textbooks for English reading were used as a guide in identifying themes and topics for reading passages. In addition

to reading comprehension, it was decided to include some vocabulary items at both class levels that would assess core reading skills such as processing word and sentence meanings.

While the test for Second class included multiple-choice items only, the test for Sixth class included multiple-choice (75%) and constructed response (25%) items. The inclusion of constructed response items facilitated assessment of higher-level interpretative and evaluative reading comprehension skills.

The final version of the Second class test comprised four forms. Each form had 20 vocabulary items (a common block across all four booklets), and 33-34 comprehension questions based on five texts (see Table 2.1 for totals). The Sixth class test also comprised four forms, each with 20 vocabulary items (again a common block), 5-6 texts, and 42-44 comprehension questions (see Table 2.2). While all of the vocabulary items at both class levels, and all comprehension items at Second class followed a multiple-choice format, two-thirds of the comprehension questions at Sixth class were multiple-choice, and one-third were constructed response (i.e., open-ended). At Second Class level, 62 minutes were allocated to testing, while at Sixth class, 70 minutes were allocated. Test booklets were randomly assigned to pupils within each participating class by the Educational Research Centre, prior to testing.

Table 2.1: Breakdown of reading test items, by purpose and process, Second class

Section	Processes	Purposes		Total
		Literary	Information	
Comprehension	Retrieve information	26	45	71
	Make inferences	25	16	41
	Interpret & integrate	17	4	21
	Examine & evaluate	---	---	---
Vocabulary	Core reading skills	---	---	20
Total		68	65	153

Table 2.2: Breakdown of reading test items, by purpose and process, Sixth class

Section	Processes	Purposes		Total
		Literary	Information	
Comprehension	Retrieve information	35	48	83
	Make inferences	33	19	52
	Interpret & integrate	21	8	29
	Examine & evaluate	5	3	8
Vocabulary	Core reading skills	---	---	20
Total		94	78	192

In addition to the reading tests, the framework for English reading specified those aspects of the questionnaires deemed relevant for understanding the performance of pupils in English reading (for example, aspects of reading instruction in classrooms, home practices related to literacy, and pupil attitudes to reading).

Figure 2.1 shows one of the texts for Second class used in the assessment, while Figure 2.2 provides the questions associated with that text. Figure 2.2 also indicates how each question was categorised according to the assessment framework, and shows the weighted percentages of pupils in Scoileanna Lán-Ghaeilge (SLG), Gaeltacht schools and schools in NA '09 who obtained correct answers on the

question. Figures 2.3 and 2.4 provide comparable information for Sixth class. Care should be exercised in interpreting percent correct scores that are within a few percentage points of each other, as such scores are not likely to be statistically significantly different from one another.

Figure 2.1: Example of a stimulus text from the *TV Timetable* test unit, Second class reading test

TV TIMETABLE Saturday 20th January		
08.00	**Arthur**	Animated series following the adventures of a young aardvark and his friends.
08.30	**Captain Planet and the Planeteers**	Animated series about a superhero out to save the environment with the help of the five planeteers.
09.00	**The Cobblestones**	Prehistoric cartoon fun with Terry Dactyl and Stacy Saurus.
09.15	**Yuck Yuck!**	Cartoon action with crime-fighting duo Ben and Belinda O'Brien, who take on the cases that become too yucky for adults to handle.
09.30	**Lucy McGurken**	Cartoon about a **junior** inventor who has all sorts of adventures with her best friend and sidekick Jamesie Woo.
10.00	**Cook 4 You**	Cookery series with cooks Dara and Alice. Together they run a special cafe where every day a different surprise guest calls in for a tasty treat.
11.00	**Freaky Friday**	An exciting movie where a mother and daughter wake up in each other's bodies after eating magical biscuits.

Figure 2.2: Sample questions from the *TV Timetable* test unit, processes assessed, and percentages of pupils answering correctly, Second class reading test

% ✓	Process	Item number & content	% ✓	Process	Item number & content
SLG 92% Gael 88% NA '09 87%	Retrieve	**Q1**. At what time does 'The Cobblestones' begin? a) 08.30 b) 09.00* c) 08.00 d) 09.30	SLG 70% Gael 66% NA '09 61%	Retrieve	**Q4**. 'Cook 4 You' is about a) cooking magical biscuits b) cooking for a special guest* c) a special guest cooking a meal d) a cookery class for children
SLG 84% Gael 76% NA '09 81%	Retrieve	**Q2**. In which TV show would you find Jamesie Woo? a) Arthur. b) Yuck Yuck! c) Lucy McGurken* d) The Cobblestones	SLG 57% Gael 55% NA '09 50%	Infer	**Q5**. Which show would you watch if you enjoy watching crimes being solved? a) The Cobblestones. b) Cook 4 You. c) Freaky Friday. d) Yuck Yuck!*
SLG 78% Gael 74% NA '09 71%	Infer	**Q3**. Which of these is a film? a) Yuck Yuck! b) Freaky Friday* c) Cook 4 You d) Lucy McGurken	SLG 52% Gael 40% NA '09 37%	Retrieve	**Q6.** Which of these programmes is the **shortest**? a) Cook 4 You b) Yuck Yuck!* c) Arthur d) Lucy McGurken

*Correct answer

Figure 2.3: Example of a stimulus text from the *Theatre Trip* test unit, Sixth class reading test

It is the 1600s. The writer is sent on a mission by his master, Falconer. He goes to the Globe Theatre in London to secretly copy Hamlet, a play by William Shakespeare, but finds some unforeseen problems.

Theatre Trip

I had been informed that, because many people considered acting to be an unsuitable occupation for women, they were forbidden by law to act upon the stage. All women's roles were played by men and boys. That fact did not occur to me now. I was totally convinced that the Queen and Ophelia were what they seemed to be. So drawn in was I by the events on the stage that it seemed less important to me to copy down the lines than to find out what these people would say or do next.

When the ghost of Hamlet's father appeared upon the balcony and called to him, I gasped but kept on writing. When Hamlet thrust his sword through the curtains, killing Polonius, who was concealed there, I was lost. I no longer noticed the press of the crowd, nor its unwashed smell for I was no longer there among them, but in Hamlet's castle in Denmark.

My petty mission no longer seemed to matter. All that mattered was whether or not Hamlet would take action to avenge his father. Every now and again, there was a passage of much talk and very little action, and I came to myself and quickly began to write. But eventually, I was drawn into the world of the play again, forgetting the world about me and the world outside, where Falconer waited.

From the start of the fencing match between Hamlet and Laertes until Hamlet's death, I believe I did not write down more than ten lines. I did get down every word of the last few speeches, but that was small comfort.

I had gone into the theatre fearful of being discovered and punished for writing down the play. I left with a dread of being punished for not having written it down. I need not have worried about being found out; no one in the audience or on the stage had paid the least attention to my writing.

Figure 2.4: Sample questions from the *Theatre Trip* test unit, processes assessed and percentages of pupils answering correctly, Sixth class reading test

% ✓	Process	Item number & content	% ✓	Process	Item number & content
SLG 85% Gael 81% NA '09 77%	Retrieve	**Q1**. Which two characters had a fencing match on stage? _____	SLG 67% Gael 55% NA '09 54%	Infer	**Q4**.The author forgot the uncomfortable conditions in the theatre because a) he was too busy writing down the words of the play. b) he was too interested in the events of the play.* c) he was too afraid of being caught. d) he was too tired and hungry.
SLG 83% Gael 78% NA '09 72%	Interpret & Integrate	**Q2**. Why do you think members of the audience paid no attention to the writer copying down parts of the play? _____	SLG 47% Gael 44% NA '09 37%	Retrieve	**Q5.** Which part of the play was the author most successful in writing out? a) The part where a ghost appears. b) The part where two men fence. c) The speeches towards the end.* d) Ophelia's entrance onto the stage.
SLG 80% Gael 85% NA '09 64%	Retrieve	**Q3**. Why were women forbidden to act in plays? _____	SLG 40% Gael 35% NA '09 21%	Interpret & Integrate	**Q6.** Why do you think the writer's master wanted a copy of the play in writing? _____

*Correct answer

Mathematics

In the Primary School Mathematics Curriculum (PSMC) (DES/NCCA, 1999d), mathematics is described as:

> . . . . the science of magnitude, number, shape, space, and their relationships and also as a universal language based on symbols and diagrams. It involves the handling (arrangement, analysis, manipulation and communication) of information, the making of predictions, and the solving of problems through the use of a language that is both concise and accurate (p. 2).

The mathematics framework (ERC, 2009) mirrored the PSMC where mathematical content strands and cognitive process skills combine to form specific instructional objectives at each class level. The mathematical content strands are: Number, Algebra, Shape & Space, Measures, and Data. The cognitive process skills are: Apply & Problem-Solve, Communicate & Express, Integrate & Connect, Reason, Implement, and Understand & Recall. It was not possible to include items dealing with Communicate & Express on a paper and pencil test.

In developing test specifications, all mathematics objectives for Second class (59 objectives) and Sixth class (78 objectives) in the PSMC were listed and items were generated by a team of item writers based on the objectives. The representation of content areas and process skills was designed to approximate the distribution of objectives as they relate to these elements on the PSMC. About one-third of items at both class levels were multiple choice, and the remaining items were constructed response – pupils were asked to write an answer, complete a diagram or graph, or make a drawing.

In designing the test, it was decided not to allow pupils to use a calculator on those parts dealing with basic computation processes (mainly items categorised as Understand & Recall and Implement). Calculators were allowed for higher-order processes (Integrate & Connect, Reason, Apply & Problem-Solve). In practice, this meant that one section (block) in each test booklet was designated as 'non-calculator'.

After piloting 120 items in Second class (across 6 blocks and 5 booklets) and 175 items in Sixth class (across 7 blocks and 10 booklets) in May 2008, a final item pool was selected for NA '09. Tables 2.3, 2.4 and 2.5 show the distribution of items across content area, process skill, and item type for Second and Sixth classes, along with the distributions of content objectives.

At Second class, the final test comprised five blocks of 20 items each, distributed over four forms, so that the middle block in each form was common, and the other blocks appeared once in the first and last positions. At Sixth class, six blocks of 25 items were distributed over six forms so that one of two non-calculator blocks appeared in the first position of each form, a common block appeared in the middle position, and one of the remaining three blocks appeared in the final position.

Table 2.3: Classification of final mathematics items by content strand – Second and Sixth classes

	Second Class		Sixth Class	
	% of Items	% of Objectives	% of Items	% of Objectives
Number/Algebra	44.0	41.0	46.0	43.0
Shape & Space	16.0	22.0	21.3	21.0
Measures	34.0	34.0	20.7	24.0
Data	6.0	3.0	12.0	12.0

Source: Eivers et al. (2010a), Tables 2.4, 2.6, pp. 20-21. Second Class: N (Items) = 100; Sixth Class: N (Items) = 150.

Table 2.4: Classification of final mathematics items by process skill category – Second and Sixth classes

	Second Class % of Items	Sixth Class % of Items
Understand and Recall	11.0	10.0
Implement	17.0	20.0
Integrate & Connect	16.0	5.3
Reason	28.0	31.3
Apply & Problem-Solve	28.0	33.3
Total	100.0	100.0

Source: Eivers et al. (2010a), Tables 2.5, 27, pp. 20-21. Second Class: N (Items) = 100; Sixth Class: N (Items) = 150.

Table 2.5: Classification of final mathematics items by item format – Second and Sixth classes

	Second Class % of Items	Sixth Class % of Items
Multiple-choice	30	37.3
Constructed response	70	62.7

Source: Eivers et al. (2010a), Table 2.8, p. 21. Second Class: N (Items) = 100; Sixth Class: N (Items) = 150.

Mathematics booklets were translated into Irish by a professional translator in preparation for NA '09. Translations were checked by a second experienced translator with extensive teaching experience and disagreements were resolved in conference. The same booklets used in NA '09 were used in NAIMS 2010.

Figures 2.5 and 2.6 provide examples of items that were included in the tests. The items, which have been categorized according to the content and process dimensions of the assessment framework, provide percent correct scores achieved by pupils in SLG, Gaeltacht schools and NA '09 schools. Again, care should be exercised in interpreting percent correct scores that are within a few percentage points of each other, as such scores are not likely to be statistically significantly different from one another.

Figure 2.5: Examples of mathematics questions – Second class

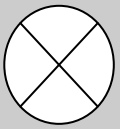
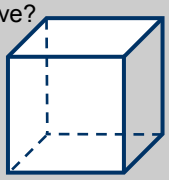
Content Area: Shape & Space: 2-D Shapes **Process:** Understand & Recall **Correct:** SLG 95% Gaeltacht 94% NA '09 94%	**Q. 1** Colour in half of this shape. 
Content Area: Measures:Time **Process:** Apply & Problem-Solve **Correct**: SLG 62% Gaeltacht 61% NA '09 65%	**Q. 2** Jane's birthday is on the 14th of March. Jack's birthday is five months later. In what month is Jack's birthday?
Content Area: Shape & Space: 3-D Shapes **Process:** Understand & Recall **Correct:** SLG 58% Gaeltacht 62% NA '09 66%	**Q. 3** Which of these do all cubes have? **O** 4 faces **O** 8 corners* **O** 6 edges **O** 12 faces 

Figure 2.5: Example of mathematics question – Second class (contd.)

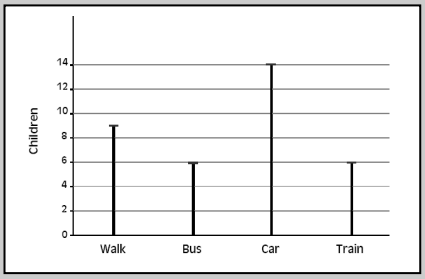
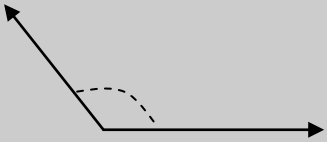
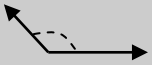
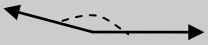
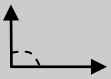
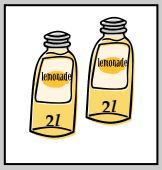
Content Area: Number & Algebra: Operations **Process:** Implement **Correct**: SLG 70% Gaeltacht 65% NA '09 55%	**Q. 4** 70 -24
Content Area: Measures: Money **Process:** Apply & Problem-Solve **Correct**: SLG 51% Gaeltacht 56% NA '09 42%	**Q. 5** Jim has 78c. He needs another 17c for a packet of football stickers. How much does the packet cost? 
Content Area: Number & Algebra: Operations **Process:** Apply & Problem-Solve **Correct**: SLG 52% Gaeltacht 50% NA '09 43%	**Q. 6** There are 30 children in Second class. Yesterday at lunchtime, 12 of them played skipping, 9 played basketball and the rest played football. How many children played football?
Content Area: Data: Represent & Interpret data **Process:** Integrate and Connect **Correct**: SLG 50% Gaeltacht 43% NA '09 39%	**Q. 7** The line graph shows the different ways pupils in 2nd Class travel to school.  How many more children travel by car than by train?
Content Area: Number & Algebra: Operations **Process:** Reason **Correct**: SLG 39% Gaeltacht 37% NA '09 25%	**Q. 8** Which of these gives the best guess of 86 – 59? **O** 70 – 50 **O** 90 – 60* **O** 80 – 60 **O** 80 – 70

Figure 2.6: Examples of mathematics questions – Sixth class

Content Area: Shape & Space: Lines & Angles **Process:** Understand & Recall **Correct:** SLG 92% Gaeltacht 90% NA '09 85%	**Q. 1** What type of angle is this? **A** Acute angle **B** Obtuse angle* **C** Right angle **D** Reflex angle 
Content Area: Data: Chance **Process:** Reason **Correct:** SLG 78% Gaeltacht 78& NA '09 80%	**Q. 2** The principal gave a quiz to all pupils in 6th class. It had 20 questions with one mark for each correct answer. The results are shown in the table. **Score out of 20** | **8** | **9** | **10** | **11** | **12** | **14** | **15** | **16** | **17** | **18** **No. of pupils** | **2** | **2** | **3** | **5** | **7** | **6** | **6** | **5** | **3** | **1** How many pupils got a score of 10?
Content Area: Shape & Space: Lines and Angles **Process:** Implement **Correct:** SLG 75% Gaeltacht 73% NA '09 75%	**Q. 3** Circle the letter under the angle that is about 135 degrees. **A***  **B**  **C**  **D** 
Content Area: Number & Algebra: Operations **Process:** Reason **Correct:** SLG 70% Gaeltacht 72% NA '09 66%	**Q. 4** Which of these is the <u>best</u> estimate of 8.61 x 22? **A** 8 x 20 **B** 10 x 22 **C** 9 x 20* **D** 9 x 25
Content Area: Data: Chance **Process:** Apply & Problem-Solve **Correct:** SLG 60% Gaeltacht 53% NA '09 51%	**Q. 5** A bag contains 4 red cubes, 6 blue cubes, and 10 green cubes. Without looking, Jenny picks a cube out of the bag. What chance has she of picking a blue cube?
Content Area: Measures: Capacity **Process:** Apply & Problem-Solve **Correct:** SLG 50% Gaeltacht 52% NA '09 47%	**Q. 8** 9 children at a party each drank 350 ml of lemonade. How much lemonade was left from these two 2 litre containers? 
Content Area: Number & Algebra: Decimals & Percentages **Process:** Implement **Correct:** SLG 27% Gaeltacht 31% NA '09 23%	**Q. 9** 2.25 x 0.4 =
Content Area: Measures: Money **Process:** Apply & Problem-Solve **Correct:** SLG 27% Gaeltacht 35% NA '09 23%	**Q. 10** On Thursday the Euro was worth 1.50 dollars on the currency market. A month later the Euro was worth 1.20 dollars. What was the percentage decrease in the value of the Euro over the month?

Sampling Schools and Pupils

As noted in Chapter 1, the two populations of interest in the current study were pupils attending schools in the Gaeltacht areas in which Irish was the medium of instruction in all classes, and pupils attending Irish-medium schools in areas outside the Gaeltacht. It was decided to sample 60 SLGs and 60 Gaeltacht schools, giving effective sample sizes of approximately 200 for each school type, or 400 in total.[5] The decision to select separate samples of SLGs and Gaeltacht schools also allowed for the possibility of reporting on performance separately in each school type, or in combination.

The sampling frame used in NAIMS was based on the Primary Schools Database 2008-09 that was issued to the Educational Research Centre by the (then) Department of Education and Science in Spring 2009. The database contained a listing of all primary schools supported by public funds in the Republic of Ireland. As well demographic data on schools (school size, numbers of boys and girls enrolled at each grade level), the database provided information on:

- Medium of instruction – whether 'all' classes were taught through English, 'some' or 'all' classes were taught through Irish, or 'some subjects' were taught through Irish.
- School type – whether 'All-Irish' (i.e., Scoil Lán Ghaeilge), 'Gaeltacht' or 'Ordinary'.

The accuracy of the database was checked against other available sources including databases for earlier school years and lists of schools, such as the list of SLG on the Gaelscoileanna website.

Some variables were added to the database including DEIS band (downloaded from the DES website), and, in respect of each SLG, whether the school had been established in the period 2001-02 to 2008-09, or earlier.

Table 2.6 shows the distribution of schools based on this analysis. The schools eligible for selection are shown in the light grey cells. The seven schools in bold appeared to be incorrectly categorised, and this was confirmed in consultation with officials of the DES. One school, in which all classes were taught through Irish, had been categorized as being 'outside the Gaeltacht'. Upon investigation, it was found that the school in question was in fact a Gaeltacht school. Hence, it was reclassified. The other 6 schools were excluded as they were found not to teach all classes through Irish (Table 2.7).

The sampling frame was split into three strata – Gaeltacht schools, SLG existing at or before 2001-02, and SLG established since 2001-02. This division was necessary since 25 schools did not have pupils listed as being in Fifth or Sixth class in 2008-09, and therefore would be unlikely to have pupils in Sixth class at the time of testing (Table 2.8).

It should be noted that schools classified as Gaeltacht, and teaching some subjects through Irish, or all subjects through English, were excluded from sampling.

[5] The value of rho used to estimate effective sample size was 0.24; this was derived for mathematics in Fourth class in the 2004 National Assessment of Mathematics Achievement.

Table 2.6: Cross-tabulation of medium of instruction by school type – 2008-09 Primary Schools Database

		School Type			
		SLG	Gaeltacht Schools	English Medium Schools	Total
Medium of Instruction	All Classes English	0	2	2065	2067
	All Classes Irish - In Gaeltacht	0	102	0	102
	All Classes Irish - Outside Gaeltacht	135	**1**	**6**	142
	Some Classes Irish	0	2	1	3
	Some Subjects Irish	4	16	841	861
	Total	139	123	2913	3175

Table 2.7: Cross-tabulation of medium of instruction by school type after resolution of ambiguities

		School Type			
		SLG	Gaeltacht Schools	English Medium Schools	Total
Medium of Instruction	All Classes English	0	2	2071	2073
	All Classes Irish - In Gaeltacht	0	103	0	103
	All Classes Irish - Outside Gaeltacht	135	**0**	**0**	135
	Some Classes Irish	0	2	1	3
	Some Subjects Irish	4	16	841	861
	Total	139	123	2913	3175

There were 103 schools in the Gaeltacht stratum. Sixty schools were selected from this stratum using probability proportional to size (PPS) systematic sampling with implicit stratification by DEIS band and school size (total number of pupils in Junior Infants to Sixth class). Fifty-three of the 103 schools were DEIS rural and one school was DEIS urban band 1. Twenty-six of the schools were selected automatically as their enrolment was greater than the interval in the systematic sampling. Three schools identified as "New since 2001/02". These were kept in the stratum because they had pupils at all (or most) levels and seemed to have been created due to amalgamations.

Fifty-eight of the 110 SLG that had been established before 2001-02 were selected from this stratum using PPS systematic sampling with implicit stratification by DEIS band and school size (total number of pupils in Junior Infants to Sixth class). Six of the schools were selected automatically as their enrolment was greater than the skip in the systematic sampling using PPS.

Table 2.8: Numbers of schools and pupils in the NAIMS sampling frame

Stratum		Second	Sixth
SLG – Pre/at 2001-02	Schools	110	110
	Pupils	3091	2636
SLG- Post 2001-02	Schools	23	23
	Pupils	278	51
Gaeltacht	Schools	102	102
	Pupils	848	991
Total	Schools	235	235
	Pupils	4217	3678
Excluded – Post 2001-02 SLG, No pupils 2nd or 6th	Schools	2	2
	Pupils	0	0
Excluded – SLG Junior - No pupils 2nd or 6th	Schools	1	1
	Pupils	0	0

Of the 25 new SLG, two were excluded from sampling because they did not have any pupils listed in First or Fifth class in 2008/09. They could not be included for selection because their MOS (measure of size) (based on numbers in First Class in this stratum) would be zero.[6] Two schools were selected from this stratum using PPS systematic sampling with implicit stratification by DEIS band and school size (number of pupils in First class). Table 2.9 shows the selected and achieved samples for English in Second and Sixth classes, while Table 2.10 shows the corresponding information for mathematics. In these tables, figures for established and newer SLG have been combined.

Table 2.9: Numbers of schools and pupils in selected and achieved samples (English reading), by school type

		Selected Sample		Achieved Sample	
Stratum		Second	Sixth	Second	Sixth
SLG Combined	Schools	60	60	54	51
	Pupils	2036	1669	1694	1413
	Classes	-	-	73	66
Gaeltacht School	Schools	60	60	51	51
	Pupils	683	799	570	596
	Classes	-	-	52	52

Numbers of classes are not given on DES databases.

Table 2.10: Numbers of schools and pupils in selected and achieved samples (mathematics), by school type

		Selected Sample		Achieved Sample	
Stratum		Second	Sixth	Second	Sixth
SLG	Schools	60	60	54	53
	Pupils	2036	1669	1702	1407
	Classes	-	-	73	66
Gaeltacht School	Schools	60	60	51	51
	Pupils	683	799	579	600
	Classes	-	-	51	52

[6] The decision to base MOS on total enrolment in 1st class was made because several schools had no pupils listed in 5th or 6th class.

NAIMS Instruments

The questionnaires used in NAIMS are based on those used in NA '09. This section describes the content of the questionnaires and the modifications made.

An expert group comprising university and college lecturers with expertise in teaching and learning through the medium of Irish (see Preface) was assembled to review the questionnaires used in NA '09, with a view to maintaining those items needed for comparison purposes, and adding items that would address issues relating to the teaching of English and mathematics in Irish-medium schools. Where appropriate, previous questions (e.g., frequency of using standardized tests, or time allocated to teaching English and mathematics) were extended to include Irish. All questionnaires are available in the National Assessments area of the ERC website.

School Questionnaire

This questionnaire, which school principals were asked to complete, contained questions about school location, intake and enrolment characteristics, school resources (e.g., library books, computers, interactive whiteboards), staffing, and provision of additional support for pupils. The questionnaire also asked about assessment and planning practices, while space was provided for principals to identify challenges in providing for the teaching of English and mathematics in their schools. The questionnaire included questions about frequency of assessment in Irish as well as English and mathematics, and school policies on the beginning of formal reading instruction and the teaching of mathematics through Irish.

Teacher Questionnaire

Broadly similar questionnaires were developed for Second and Sixth classes. Teachers were asked about qualifications, teaching experience, experience of continuing professional development, and classes taught. There were also asked about the resources and strategies used in the teaching of English reading and mathematics, as well as the amount of time allocated to teaching these subjects, and their confidence in implementing various instructional strategies. The questionnaires also included items on the availability of resources such as books, computers and interactive whiteboards for teaching English and mathematics, and provision of additional support to pupils. Additions to the 2009 questionnaires included items on courses attended relating to the teaching of Irish, the language of instruction in mathematics lessons, reasons for not teaching mathematics exclusively through Irish (if relevant), numbers of Irish books in class libraries, and a separate section, similar to those for English and mathematics, on the teaching of Irish.

Pupil Rating Form

Each class teacher was given a Pupil Rating Form on which they were asked to provide contextual information about each pupil who participated in the survey. Areas covered included attendance, receipt of support, general academic ability, and class level of English/mathematics materials typically used by the pupil. The Second and Sixth class versions of the forms sought the same information. No changes to the Pupil Rating Form were made from that used in NA '09.

Pupil Questionnaire

The pupil questionnaire asked about the language spoken at home, homework practices, attitudes to, and engagement in reading and mathematics, and other activities outside the school. The Second class questionnaire was a shorter, more simplified version of the Sixth class questionnaire. Modifications for NAIMS included additional questions on time spent on Irish homework, attendance at extra Irish lessons outside of school time, and self-assessed proficiency in Irish reading. The Sixth class questionnaire also included additional questions on pupils' attitudes to use of Irish in a number of contexts, and language preferences where reading and mathematics are concerned.

Parent Questionnaire

The parent questionnaire was almost identical for both grade levels. It included questions relating to family size, parental occupations, home educational processes and resources, parental reading habits and frequency of providing help with homework. Information on parental occupations was later used to construct a socioeconomic scale (based on the higher of the two parents' occupations). On the NAIMS versions of the questionnaires, parents were also asked to rate their child's proficiency in Irish reading (to allow comparison with English reading), to indicate when their child showed an interest in Irish and English reading for the first time, to estimate the numbers of Irish and English books in the home (no distinction was made between these in NA '09), to indicate their own proficiency in Irish, and to record the frequency with which they used the Irish language in a range of reading and speaking contexts.

Response Rates

Response rates, reported in Table 2.11 (SLG) and 2.12 (Gaeltacht schools), are based on the participating schools in the study. Pupils who transferred and those who were exempted were not excluded in computing response rates. Nevertheless, response rates exceed 90% in all cases and are therefore comparable with those achieved in NA '09.

Table 2.11: Response rates for Second and Sixth classes – SLG

	2nd Class (N = 1800)		6th Class (N = 1505)	
	N Completed	% Completed	N Completed	% Completed
Maths Test Booklet	1702	94.6	1407	93.5
English Test Booklet	1694	94.1	1413	93.9
Pupil Questionnaire	1702	94.5	1455	96.7
Parent Questionnaire	1640	91.1	1390	92.4
	N. Classes = 73		N. Classes = 66	
Pupil Rating Form	72	98.6	64	97.0
Teacher Questionnaire	71	97.3	65	98.5
		N. Schools = 54		
School Questionnaire	53		% = 98.1	

Denominators are number of pupils enrolled in Second or Sixth class, according to lists provided by participating schools, numbers of Second or Sixth class teachers in participating schools, or numbers of participating schools.

Table 2.12: Response rates for Second and Sixth classes – Gaeltacht schools

	2nd Class (N = 617)		6th Class (N = 635)	
	N Completed	% Completed	N Completed	% Completed
Maths Test Booklet	579	93.8	600	94.5
English Test Booklet	570	92.3	596	93.9
Pupil Questionnaire	582	94.3	612	96.4
Parent Questionnaire	586	95.0	603	95.0
	No. of Classes (N = 52)		No. of Classes (N = 52)	
Pupil Rating Form	51	98.1	51	98.1
Teacher Questionnaire	51	98.1	52	100.0
	Schools = 54			
School Questionnaire	52		% = 96.3	

Denominators are number of pupils enrolled in Second or Sixth class, according to lists provided by participating schools, numbers of Second or Sixth class teachers in participating schools, or numbers of participating schools.

At each test administration (English reading and mathematics), teachers were asked to complete a Test Administration Form detailing the number present, the number absent, the number exempted from testing, and the number who had left the school. Tables 2.13 and 2.14 are based on that information. Overall, exemptions from testing were low, ranging from 5 (Gaeltacht schools, Sixth Class, Maths) to 14 (SLG, Second Class, Maths) pupils. The category 'transferred / left school' relates to pupils who left the school or were incorrectly included on lists of pupils provided by the school several weeks before testing.

Table 2.13: Reasons for non-completion of test booklets – SLG (number of pupils)

	Absent	Exempt	Transferred / Left School	Total
Second Class – English Reading	93	9	4	106
Second Class – Maths	80	14	4	98
Sixth Class – English Reading	87	6	2	94
Sixth Class – Maths	93	7	2	101

Table 2.14: Reasons for non-completion of test booklets – Gaeltacht schools (number of pupils)

	Absent	Exempt	Transferred / Left School	Total
Second Class – English Reading	36	11	0	47
Second Class – Maths	31	7	0	38
Sixth Class – English Reading	33	6	0	39
Sixth Class – Maths	30	5	0	35

Tables 2.15 and 2.16 provide a breakdown of exemptions from testing, by exemption category. The tables show that most exemptions are accounted for by specific learning disabilities (e.g., severe dyslexic difficulties) and general learning disabilities. The number of unexplained exemptions for Second class mathematics may be related to the fact that the test had to be administered in English or Irish to all pupils in a class, and a few pupils may have been exempted if they were deemed unable to attempt the test in Irish (in Sixth class, individual pupils had a choice).

Table 2.15: Reasons for exemptions from testing – SLG (number of pupils)

	Specific Learning Disability	General Learning Disability	Physical Disability	Limited Proficiency in English	Other	No Reason Given
Second: English Reading	3	3	0	0	0	3
Second: Mathematics	3	4	0	0	1	6
Sixth: English Reading	4	1	0	0	1	0
Sixth: Mathematics	4	2	0	0	1	0

Table 2.16: Reasons for exemptions from testing – Gaeltacht schools (number of pupils)

	Specific Learning Difficulty	General Learning Disability	Physical Disability	Limited Proficiency in English	Other	No Reason Given
Second: English Reading	0	4	1	0	1	1
Second: Mathematics	1	6	1	0	1	2
Sixth: English Reading	2	3	0	0	0	1
Sixth: Mathematics	0	4	0	0	0	1

Implementation of NAIMS in Schools

The same arrangements that were in place for NA '09 were used to implement NAIMS in schools (see Eivers et al., 2010a, Chapter 2). The Educational Research Centre contacted each selected school and invited it to participate in NAIMS. Schools agreeing to participate were asked to complete a School Form that sought information about enrolment numbers for each Second and Sixth class, and the name and contact details of a School Co-ordinator, who would liaise with the Educational Research Centre before and during the study.

Thirty-one DES inspectors, who had received training on the aims and procedures of the assessments, were assigned to participating schools to support them in implementing NAIMS and to function as quality monitors.

Testing took place in most schools between the 12th and 28th of May 2010, with schools selecting two mornings in the test window that suited them and on which their assigned Inspector was available. Order of administration of the English and mathematics tests was rotated across schools, with half of schools in each school type doing English reading first, and half doing mathematics first.

At Second class, schools were asked to indicate in advance, in respect of each participating class, whether the class would take the mathematics test in English or Irish, as directions for the mathematics test must be read aloud, and hence the test can be administered in one language only.[7] At Sixth class, class teachers were asked to indicate the preferred language of the mathematics test in advance, in respect of each pupil in their class. Teachers administering the mathematics test through Irish could provide the corresponding English version of a word or phrase if requested, though it was made clear that help on solving specific mathematics questions could not be provided.

Table 2.17 shows the percentages of pupils at each class level who took the mathematics test in English and Irish. The table shows that over 90% of pupils in Second class in SLG took the mathematics test in Irish, and over 80% in Sixth class did so. In Gaeltacht schools, about one-half of pupils in Second and three-fifths in

[7] The reason the mathematics test is read aloud is to compensate for possible differences in reading ability among pupils. By Sixth class, pupils are expected to be able to read mathematics items in the language of test.

Sixth took the mathematics test in Irish. The increase in uptake in Irish may reflect the growing competence in Irish of pupils in Gaeltacht schools who did not speak the language of instruction at home. The performance of pupils at each class level/school type by test language is described in Chapter 3. In Chapter 6, links are established between language of instruction, language of the test, and performance on the test.

Table 2.17: Unweighted and weighted percentages of pupils taking the mathematics test in English or Irish, by class level and school type (NAIMS, 2010)

	Maths Test Language - Irish		Maths Test Language - English	
	Unweighted	Weighted	Unweighted	Weighted
Second Class				
SLG	90.8	90.7	9.2	9.3
Gaeltacht Schools	47.7	48.8	52.3	51.2
Sixth Class				
SLG	81.3	81.2	18.7	18.8
Gaeltacht Schools	62.2	59.2	37.8	40.8

Inspectors who monitored testing in each school circulated between participating classes. At the end of testing (i.e., after both tests had been completed on different days), they completed two forms: an Observation Form that summarised their views on how well schools had handled aspects of test administration, and a Review Form that summarised the views of School Co-ordinators on aspects of implementation of NAIMS. Inspectors interviewed School Co-ordinators before completing the Review Form.

Table 2.18 summarises inspectors' responses to the Observation Form. For most aspects of testing, all or almost all inspectors expressed satisfaction with how testing had been conducted.

Table 2.18: Inspectors' evaluations of aspects of test administration in schools

Aspect of Testing	% of Schools (Good in all or most cases)	
	SLG	Gaeltacht
Teacher preparation for test administration	93.8	100.0
Suitability of room for test	100.0	98.1
Adherence to guidelines for exemptions	100.0	100.0
Adherence to time limits	100.0	100.0
Checking that correct test booklets assigned	100.0	98.1
Appropriateness of help provided	100.0	100.0
Atmosphere (noise level, concentration)	100.0	100.0

However, some difficulty was encountered with the distribution of Parent Questionnaires in a small number of SLG and Gaeltacht schools, with some teachers failing to match identification numbers of the questionnaires with those on a corresponding class list. Hence, it was not possible in all cases to match pupils to their parents. However, since the numbers involved were small, this was not deemed to have a substantive impact on the quality of individual pupil data. Furthermore, it had no impact on estimates of achievement and was only relevant to linkages between achievement and home background at individual pupil level.

In general, school co-ordinators contributing to the Review Form expressed satisfaction with the implementation of the study. Positive aspects of the assessment identified by co-ordinators included:

- *The study will draw attention to the teaching of mathematics in Irish-medium schools*
- *The questionnaires focused teachers' attention on a broader range of methodologies, promoting school self-evaluation.*
- *Administration of mathematics tests in Irish for the first time will strengthen teachers' confidence.*
- *Assessment established new rapport between teachers, pupils and inspector.*

Aspects of the assessment identified by co-ordinators as needing improvement included:

- *Mathematics test too long in Sixth class, leading to raised fatigue levels. Could be spread over two days.*
- *Mathematics test over-emphasised problem solving to the neglect of more straight-forward questions.*
- *Sample questions should be provided to schools in advance.*
- *Terminology in mathematics tests unsuitable and should be simplified.*
- *Significant workload for teachers ahead of the assessment in completing forms and questionnaires (more time needed).*
- *Timing of survey (end of school year) inappropriate (March/April preferred).*
- *Second class coincides with Sacraments, making the assessment more difficult to implement.*
- *Questions on teaching methodology could be viewed as invasive.*
- *Classrooms too small to separate pupils properly during testing.*
- *Particular difficulties in administering tests in multi-grade classes (Gaeltacht school).*

Weighting, Scaling and Analysis Procedures

When test booklets were returned to the Educational Research Centre, constructed response items were scored by trained markers, and test booklets were sent for data entry. Questionnaires were also checked and sent for data entry. Returned data files were spot checked using a small subset of test booklets and questionnaires. Following this, the data tables were submitted to a cleaning process, whereby duplicate IDs, inconsistencies relating to gender etc. were resolved. Items for which out-of-range values had been entered were also checked.

Weighting

Bias in assessments such as NAIMS can arise from two sources: (i) disproportionate sampling of schools (and hence pupils) relative to the populations of interest; and (ii) non-response by schools and pupils selected to participate. The procedure used to calculate weights was the same one used in NA '09 (see Eivers et al., 2010b, p. 37), where adjustments are made for non-response at school and pupil levels. Sampling weights are used during the scaling of test data and the analysis of achievement and questionnaire responses.

Scaling the Achievement Tests

Scaling of the English reading and mathematics tests for Second and Sixth classes was conducted using Item Response Theory methodologies (see Eivers et al., 2010b, Chapter 4). Item parameters obtained in course of scaling the tests in NA '09 were applied to the corresponding items in NAIMS. In this way, pupils' performance on NAIMS was placed on the same scales as those used in NA '09.[8]

[8] In NA '09, all scales were set to a mean of 250 and a standard deviation of 50.

The outcomes of this exercise are reported in Chapter 3, where performance on NA '09 and NAIMS are compared for overall scales and subscales in each domain.

The cut-points for proficiency levels developed in the context of NA '09 (see Eivers et al., 2010b, Chapter 6) were applied to pupils' scores in NAIMS, allowing for a comparison of the proportions of pupils scoring at each level on each test across the two studies. The proficiency levels provide descriptions of the knowledge and skills of pupils at different levels of performance in English and mathematics, and hence provide a criterion-referenced measure of performance.

Analyzing the Data

Results (e.g., test scores, percentages of pupils or parents) presented in the remainder of this report are weighted. Where comparisons between mean scores are made, jackknifed standard errors around mean scores are also given.[9] These standards errors take into account the fact that pupils in NAIMS were not randomly selected, but, instead, were clustered in schools, and hence may have been more similar to one another than if pupils had been selected randomly from the population. In general, jackknifed standard errors are larger than the standard errors obtained for simple random samples, and make it more difficult to find statistically significant differences.

Where comparisons among three or more groups are made (e.g., between SLG, Gaeltacht schools and NA '09 schools), alpha levels are adjusted to guard against making a Type 1 error (i.e., declaring a difference to be statistically significant, when it isn't). Thus, if three comparisons are made, the alpha level that is used to construct a confidence interval around difference scores is .05/3.

In deciding on an appropriate group from NA '09 against which to compare the performance of pupils in NAIMS, there was a choice between selecting pupils in English-medium schools who had participated in the assessment, or selecting all pupils who had participated, including a small number from Irish-medium schools. Since relatively few pupils in SLG and Gaeltacht schools participated in NA '09 (7 SLG and 3 Gaeltacht schools), and the inclusion or exclusion of Irish-medium schools did not make any substantive difference to key indicators of performance such as mean achievement scores, it was decided to benchmark the performance of pupils in NAIMS against all pupils in NA '09. A practical consequence of this is that readers of this report can compare mean scores in NAIMS with the mean of 250 set for all tests and subtests in NA '09.

Associations between contextual variables (e.g., socioeconomic status) and achievement are examined in three ways: (i) by examining correlations (values between -1 and +1 that show the strength of a relationship); (ii) by comparing mean scores (e.g., the mean reading scores of pupils with high, average and low values on an SES scale); and (iii) by using multi-level modeling, where the effect of a variable on performance can be examined, while controlling for other relevant variables.

[9] WesVar (Westat, 2000) was used to compute jackknifed standard errors.

Key Points

- The assessment frameworks for NA '09, and the tests of English reading and mathematics used in 2009 were also used in NAIMS, without modification. Some additions were made to the School, Teacher, Parent and Pupil Questionnaires to take into account the specific circumstances of Irish-medium schools.
- Samples of 60 SLG and 60 Gaeltacht schools were selected to participate in NAIMS. Fifty-four SLG and 51 Gaeltacht schools participated, giving school-level response rates of 90% and 85% respectively. Within schools, response rates exceeded 90% for the tests of English reading and mathematics, and for all questionnaires administered. Very small numbers of pupils were exempted from testing by their teachers, and those who were exempted typically had general or specific learning disabilities.
- Implementation of NAIMS in schools was overseen by members of the Inspectorate of the (then) Department of Education and Science. Tests were administered in most schools on two designated days between the 12th and 28th of May, 2010. At Second class, teachers had the option of administering the test of mathematics in either English or Irish. At Sixth class level, teachers indicated a preference in respect of individual pupils. Some difficulty was encountered with the distribution of Parent Questionnaires in a small number of SLG and Gaeltacht schools, though, since the numbers were small, this was not deemed to have had a substantive impact on the quality the data.
- The test scores of pupils in NAIMS were placed on the same underlying scales as the scores of pupils in NA '09, facilitating comparisons of performance across the two studies.

Chapter 3
Achievement Outcomes

This chapter describes the achievements of pupils in Scoileanna Lán-Ghaeilge (SLG) and in Gaeltacht schools who participated in NAIMS 2010, and compares their performance with that of pupils in the national sample in NA '09. The chapter is divided into four sections. First, overall performance and performance on the subcomponents of English reading and mathematics are described. Second, performance in mathematics is examined with respect to the language in which pupils completed the test. Third, performance is considered with reference to proficiency levels. Fourth, ratings of pupil performance provided by teachers, parents and pupils are compared to achieved performance. In each section, where relevant, reference is made to gender differences in performance.

The mean score for each domain and subdomain in English reading and mathematics in NA '09 was set to 250, and the standard deviation to 50. Since pupil scores in NAIMS were placed on the same scales used in NA '09 (see Chapter 2), it is possible to compare the performance of pupils in SLG and Gaeltacht schools with the performance of pupils in NA '09.

Performance on English Reading

Table 3.1 shows that the mean scores of pupils in Second (267) and Sixth (266) classes in SLG were significantly higher than the corresponding NA '09 mean scores (both 250), by about one third of a standard deviation (16 points) in each case. The mean score of pupils in Sixth class in Gaeltacht schools (257) was also significantly higher (by about one-sixth of a standard deviation) than the corresponding mean in NA '09 (250). However, at Second class, the difference in reading performance between pupils in Gaeltacht schools and in NA '09 schools (3 points) was not statistically significant.

Table 3.1: Mean scores of pupils on overall English reading, by school type and class level

	Second Class		Sixth Class	
	Mean	SD	Mean	SD
SLG	**267**	49	**266**	45
Gaeltacht Schools	253	47	**257**	46
NA '09 (Ref.)	250	50	250	50

Mean scores that are significantly different than in NA '09 within class level are shown in **bold**.

We can also compare the performance on English reading of pupils in SLG and Gaeltacht schools (see e-Appendix[10], Table A3.1). At Second class, pupils in SLG (267) achieved a significantly higher mean score than pupils in Gaeltacht schools (253). At Sixth class, the difference in mean scores between pupils in SLG (266) and pupil in Gaeltacht schools (257) was not statistically significant.

[10] Tables in the e-Appendix (*www.erc.ie*) in which an A precedes the table number are expansions of corresponding tables in this report. For example, e-App. Table A3.1 is an expansion of Table 3.1. There are also additional data tables in the e-Appendix, in which an E precedes the table number (e.g., e-App. Table E3.1). Tabulation corresponding to figures in this report can also be found in the e-Appendix).

Performance can also be described at different points along an achievement distribution. Table 3.2 provides scores of pupils at key percentile ranks for English reading at Second and Sixth classes. At both class levels, pupils in SLG were consistently ahead of their counterparts in Gaeltacht schools and in NA '09. On the other hand, for the most part, the distribution of scores in Gaeltacht schools is very similar to the distribution in NA '09, although up to the 40th percentile, Sixth class pupils in Gaeltacht schools have higher scores than their counterparts in NA '09. Unlike Table 1.3 in Chapter 1 (based on the 1988 National Assessment of English Reading in Fifth class), the scores of pupils in SLG and NA '09 do not converge at higher levels of performance.

Table 3.2: Scores at key markers on the overall English reading scale, by school type and class level

	Second Class			Sixth Class		
Percentile	SLG	Gaeltacht	NA '09	SLG	Gaeltacht	NA '09
10th	203	192	186	208	198	183
20th	222	209	204	227	218	204
30th	238	221	218	241	232	220
40th	250	237	232	251	244	236
50th	264	250	247	264	254	253
60th	277	265	260	276	270	265
70th	292	279	276	290	282	277
80th	312	297	293	308	295	293
90th	331	319	319	327	319	316

Differences in reading achievement between boys and girls in SLG were small and not statistically significant in either Second or Sixth classes (Table 3.3). Whereas no difference was observed in Second class in Gaeltacht schools, girls in Sixth class significantly outperformed boys in reading. In NA '09, girls outperformed boys in Second class (by over one-fifth of a standard deviation), whereas no significant difference was found in Sixth.

Table 3.3: Mean scores of boys and girls on overall English reading, by school type and class level

	Second Class		Sixth Class	
	Boys	Girls	Boys	Girls
SLG	268	265	267	265
Gaeltacht	253	254	252	**262**
NA '09	243	**257**	248	252

Mean scores that are significantly higher within school type and class level are in **bold**

Performance in reading can also be examined with reference to two subcomponents – vocabulary knowledge and reading comprehension – which, together, contribute to pupils' overall scores in reading. Table 3.4 summarises performance on reading vocabulary and reading comprehension for pupils in Second and Sixth classes. The table shows that, for vocabulary and comprehension in Second and Sixth classes, mean scores are significantly higher in SLG than in NA '09. At Sixth class (but not Second) mean scores for pupils in Gaeltacht schools on reading vocabulary and reading comprehension are significantly higher than in NA '09. Finally, in the case of reading vocabulary and reading comprehension in Second class, but not Sixth, pupils in SLG have significantly higher mean scores than their counterparts in Gaeltacht schools (e-App. Table A3.4). Although in Sixth class the mean score of

pupils in SLG on reading comprehension is some seven points higher than that of pupils in Gaeltacht schools, the difference is not statistically significant.

Table 3.4: Mean scores of pupils on English reading vocabulary and reading comprehension subscales, by school type and class level

	Second Class		Sixth Class	
	Mean Vocabulary	Mean Comprehension	Mean Vocabulary	Mean Comprehension
SLG	**268**	**265**	**266**	**265**
Gaeltacht School	253	253	**256**	**258**
NA '09 (Ref.)	250	250	250	250

Mean scores that are significantly different within class level from NA '09 are in **bold**.

Performance in reading literacy can also be classified by reading subprocess. Three such subprocesses are identified at Second class: Retrieve, Infer, and Interpret & Integrate (see Chapter 2 for descriptions). An additional subprocess, Examine & Evaluate, is assessed at Sixth class. Outcomes of the reading subprocesses for Second and Sixth classes are summarised in Table 3.5. In line with their stronger overall performance in reading, pupils in Second class in SLG outperformed pupils in NA '09 on Retrieve, Infer and Interpret & Integrate. On Infer and Interpret & Integrate, but not on Retrieve, pupils in Second class in SLG had significantly higher mean scores than pupils in Gaeltacht schools (e-App. Table A3.5).

Pupils in SLG outperformed pupils in NA '09 on all four process scales at Sixth class, while pupils in Gaeltacht schools outperformed pupils in NA '09 on three of four scales (Table 3.5). The exception was Examine & Evaluate, where the difference in favour of pupils in Gaeltacht schools over pupils in NA '09 schools was not statistically significant. Differences in favour of pupils in SLG over pupils in Gaeltacht schools were not statistically significant for any of the four scales in Sixth class (e-App. Table A3.5).

Table 3.5: Mean scores of pupils by reading subprocess, by school type and class level

	Second Class	Sixth Class
Retrieve		
SLG	**264**	**262**
Gaeltacht Schools	254	**257**
NA '09 (Ref)	250	250
Infer		
SLG	**263**	**265**
Gaeltacht Schools	252	**257**
NA '09 (Ref.)	250	250
Interpret & Integrate		
SLG	**264**	**265**
Gaeltacht Schools	253	**258**
NA '09 (Ref.)	250	250
Examine & Evaluate		
SLG	n/a	**256**
Gaeltacht Schools	n/a	253
NA '09 (Ref.)	n/a	250

Mean scores that are significantly different from NA '09 within class level are in **bold**

Performance on Mathematics

In mathematics, pupils in Second class in SLG (258) had a significantly higher mean score than pupils in NA '09 (250) (Table 3.6). The difference in performance between pupils in Second class in Gaeltacht schools (256) and pupils in NA '09 (250) was not statistically significant. Pupils in Sixth class in Gaeltacht schools achieved a significantly higher mean score (259) than pupils in NA '09 (250) at that class level. The difference in performance between pupils in SLG and pupils in NA '09 in Sixth class was not statistically significant.

Pupils in SLG and Gaeltacht schools did not perform significantly differently from one another in overall mathematics at either Second or Sixth class (e-App. Table A3.6).

Table 3.6: Mean scores of pupils in overall mathematics, by school type and class level

	Second Class		Sixth Class	
	Mean	St. Dev.	Mean	St. Dev.
SLG	**258**	49	254	45
Gaeltacht Schools	256	46	**259**	45
NA '09 (Ref)	250	50	250	50

Mean scores that are significantly different from NA '09 within class level are in **bold**.

Table 3.7 provides scores at key percentile markers on the mathematics scale. At Second class, performance at virtually all markers is higher for pupils in SLG, compared with pupils in NA '09 schools. At Sixth class, performance is higher for pupils in Gaeltacht schools compared with NA '09 schools up to the 60th percentile, but then converges. Pupils in SLG perform marginally better than pupils in NA '09 schools at each percentile rank up to the 50th. Performance converges as higher achievers (those scoring at the 60th, 70th, 80th and 90th percentiles) in the two school types perform at about the same level.

Table 3.7: Scores at key percentile markers on the overall mathematics scale, by school type and class level

	Second Class			Sixth Class		
Percentile	SLG	Gaeltacht	NA '09	SLG	Gaeltacht	NA '09
10th	193	195	184	195	201	183
20th	216	217	206	213	218	204
30th	233	233	222	229	233	221
40th	247	247	238	241	245	235
50th	259	258	250	254	259	249
60th	272	272	262	265	273	263
70th	283	285	277	279	282	279
80th	300	296	293	294	296	294
90th	320	310	313	313	315	315

Boys in Second and Sixth classes in SLG achieved significantly higher scores in mathematics than girls (Table 3.8). In NA '09, differences in favour of boys at both class levels were not statistically significant. Differences between boys and girls in Gaeltacht schools were not statistically significant at either Second or Sixth class.

Table 3.8: Gender differences on mathematics, by school type and class level

	Second Class		Sixth Class	
	Boys	Girls	Boys	Girls
SLG	**264**	251	**258**	249
Gaeltacht Schools	260	253	258	259
NA '09	252	248	253	247

Mean scores that are significantly different within class level are in **bold**.

Mathematics performance can also be examined by content area and subprocess. Pupils in Second class in SLG outperformed their counterparts in NA '09 schools on three areas (Number/Algebra, Measures and Data), and had a significantly lower mean score on the fourth – Shape and Space (Table 3.9). Pupils in Second class in Gaeltacht schools outperformed pupils in NA '09 on one content areas – Measures. Differences between pupils in SLG and Gaeltacht schools were not statistically significant for any of the content areas (e-App. Table A3.9).

Pupils in Sixth class in SLG significantly outperformed pupils in NA '09 on one content area – Number – while pupils in Gaeltacht schools outperformed pupils in NA '09 schools on three – Number, Measures and Space & Shape. There were no significant differences between pupils in SLG and Gaeltacht schools on any of the content areas at this class level (e-App. Table A3.9).

Table 3.9 Mean scores of pupils by mathematics content area, by school type and class level

	Second Class	Sixth Class
Number/Algebra		
SLG	**261**	**257**
Gaeltacht	258	**260**
NA '09	250	250
Measures		
SLG	**260**	253
Gaeltacht	**258**	**259**
NA '09	250	250
Shape & Space		
SLG	**240**	251
Gaeltacht	245	**259**
NA '09	250	250
Data		
SLG	**256**	246
Gaeltacht	251	248
NA '09	250	250

Mean scores that are significantly different from corresponding scores in NA '09 are shown in **bold**.

Pupils in Second class in SLG and Gaeltacht schools significantly outperformed their counterparts in NA '09 schools on two mathematics process skills – Implement and Apply & Problem Solve (Table 3.10). Differences between Second class pupils in SLG and Gaeltacht schools were not statistically significant for any of the mathematics process skills (e-App. Table A3.10).

Pupils in Sixth class in SLG outperformed their counterparts in NA '09 on one mathematics process skill – Implement. Pupils in Sixth class in Gaeltacht schools outperformed pupils in NA '09 on three – Recall, Implement, and Apply & Solve Problems (Table 3.10). No differences between Sixth class pupils in SLG and

Gaeltacht schools on mathematical processes were statistically significant (e-App. Table A3.10).

Table 3.10 Mean scores of pupils by mathematics process skill, by school type and class level

	Second Class	Sixth Class
Recall		
SLG	246	255
Gaeltacht School	252	**259**
NA '09	250	250
Implement		
SLG	**260**	**265**
Gaeltacht School	**258**	**271**
NA '09	250	250
Integrate & Connect		
SLG	254	251
Gaeltacht School	254	254
NA '09	250	250
Reason		
SLG	258	251
Gaeltacht School	256	255
NA '09	250	250
Apply & Problem Solve		
SLG	**260**	254
Gaeltacht School	**258**	**259**
NA '09	250	250

Mean scores that are significantly different within class level from NA '09 are in **bold**.

Performance on Mathematics, by Test Language

Pupils could take the mathematics test in either English or Irish. At Second class, this was decided on a class-by-class basis by pupils' teachers, while at Sixth class, it could be decided at the individual pupil level (see Chapter 2). Table 3.11 shows the percentages of pupils taking the mathematics test in Irish and English at each class level, for each school type, and the corresponding mean overall mathematics scores. At Second class, 91% of pupils in SLG took the mathematics test through Irish, while 49% of pupils in Gaeltacht schools did so. Although the mean score of those taking the test in English in SLG (276) was higher than that of those taking it in Irish (256), the difference was not statistically significant. This non-significance is a function of the large standard errors associated with mean scores, as there is no systematic relationship between sampling variables and whether pupils took the mathematics test in English or Irish. Pupils in Second class in Gaeltacht schools taking the mathematics test in English also outperformed those taking it in Irish, but not to a significant degree.

In Sixth class, over four-fifths of pupils (81%) in SLG completed the mathematics test in Irish, while about three-fifths (59%) in Gaeltacht schools did so. Pupils in SLG who completed the mathematics test in Irish achieved a mean score (255) that was about the same as that of those who took it in English (251). Pupils in Gaeltacht schools who took the mathematics test in Irish in Sixth class also had a similar mean score (258) to those who took it in English (260).

It is noteworthy that while 49% of pupils in Gaeltacht schools took the Second class mathematics test in Irish, 59% did so in Sixth class. In SLG, on the other hand, there was a decline by Sixth class in the proportion taking the mathematics test in Irish.

Table 3.11: Mean scores of pupils who took the mathematics test in English or Irish, by school type and class level

	Second Class		Sixth Class	
	Percent of Pupils	Mean Overall Mathematics	Percent of Pupils	Mean Overall Mathematics
SLG				
Irish (Ref)	91	256	81	255
English	9	276	19	251
All	100	258	100	254
Gaeltacht				
Irish (Ref)	49	251	59	258
English	51	261	41	260
All	100	256	100	259

No statistically significant differences were found within school type/grade level

Additional analyses are reported in Chapter 6 on relationships between the language in which mathematics is taught by pupils' teachers, the language in which the test was taken, and mathematics performance.

Performance by Proficiency Level

As noted in Chapter 2, performance in English reading and mathematics can be reported in terms of the proficiency levels that were developed for NA '09. Proficiency levels provide descriptions of the types of reading and mathematics tasks on which pupils at different levels of performance are expected to succeed. Hence, pupils at Level 4 would be expected to complete the most complex tasks for their class level, while pupils at Level 1 would be expected to complete the most basic tasks. It is assumed that pupils who achieve at a particular level would be successful on tasks at lower levels of proficiency (for example, a pupil achieving at Level 4 in reading would have a high probability of success on Level 3 items). It is not possible to describe tasks on which pupils scoring below Level 1 would succeed as there were too few test items on which to base descriptions. The report on NA '09 provides examples of test items associated with each proficiency level in English reading and mathematics (see Eivers et al., 2010a, Chapter 3).

English Reading

Tables 3.12 and 3.13 summarise the performance of pupils on the reading proficiency scales. Table 3.12 shows that, at Second class, 17% of pupils attending SLG performed at Level 4 in English reading, compared with 10% of pupils in both Gaeltacht schools and schools in NA '09. On the other hand, 21% of pupils in SLG performed at or below Level 1, compared with 32% in Gaeltacht schools, and 35% in NA '09. This indicates that, at Second class level, there were more pupils with higher-level reading skills, and fewer pupils with weak reading skills in SLG than in Gaeltacht or NA '09 schools.

Table 3.12: Percentages of pupils at each proficiency level on the overall English reading scale by school type, Second class

Level & score range	What pupils can typically do	SLG	GAEL	NA '09
4 320+	As well as succeeding on lower proficiency level skills, pupils at level 4 can retrieve complex information (e.g., the information needed is located in multiple parts of the text). They can link multiple pieces of information to draw inferences. They can integrate text-wide information in order to identify the main themes in a text. As well as using discrete or explicit information, they can use the text as a whole to interpret character behaviour.	17	10	10
319 3 269	As well as Level 1 and 2 skills, pupils can process texts at a whole-text level, in order to retrieve information. They can make basic-level inferences, sometimes linking one or two discrete pieces of information. They can infer word meanings if the context provides clear clues.	29	27	25
268 2 225	As well as Level 1 skills, pupils can retrieve explicitly stated information where the wording of the question and the text differ. However, the information sought must be specific to a small section of text. They can make low-level inferences, including character motives, if the required information is explicitly stated in a specific section of the text.	33	31	30
224 1 187	Level 1 pupils show basic reading skills. They can retrieve simple, explicitly stated, pieces of information, when there is a direct match between the wording of the question and the text. They are most successful on tasks that require comprehension of smaller units of text, such as sentences. They can perform some very basic interpretation and integration of text (e.g., identifying the theme of a text, where the theme is explicitly stated in the text).	16	26	25
<187	Pupils below proficiency level 1 have a less than 62.5% chance of correctly answering a Level 1 question. Their reading skills are very low, relative to other 2nd class pupils and are not properly assessed by the National Assessment.	5	6	10

At Sixth class, 15% of pupils in SLG performed at Level 4 on English reading, compared with 11% in Gaeltacht schools and 10% in NA '09 (Table 3.13). On the other hand, 22% of pupils in SLG performed at or below Level 1, compared with 27% in Gaeltacht schools, and 35% in NA '09. Hence, in broad terms, the advantage enjoyed by pupils in SLG in Second class is maintained through Sixth class. By Sixth class, about 5% of pupils in SLG and Gaeltacht schools performed below Level 1, compared with 10% in NA '09. This can be interpreted as indicating that there are fewer pupils with very serious English reading literacy difficulties in Irish-medium schools than in schools more generally.

Table 3.13: Percentages of pupils at each proficiency level on the overall English reading scale by school type, Sixth class

Level & score range	What pupils can typically do	SLG	GAEL	NA '09
4 (317+)	As well as skills exemplifying lower levels, pupils at proficiency level 4 show advanced retrieval skills. They can find answers where the phrasing of the text and question differ considerably. They do not need to rely on explicitly stated information or connections, but can infer answers from multiple pieces of text, and use broad themes at whole-text level to infer an answer. They can evaluate the rationale behind a piece of text, even where the text covers multiple events/topics, and the overall rationale is not apparent unless analysed at a global level.	15	11	10
316 **3** **271**	As well as Levels 1 and 2 skills, pupils at Level 3 have complex retrieval skills. They can examine multiple elements of the text to locate the correct response and rule out incorrect responses. They can answer items where the phrasing in the text and question are not identical, and locate detail in dense texts such as advertisements or dictionaries. Pupils at level 3 have more strongly established inferencing skills (e.g., they are consistently able to link two pieces of information from a text to infer the correct response). They can interpret meanings at whole-text level, and integrate this with personal knowledge or experience, in order to identify a correct response. They can use opinion and external knowledge to evaluate arguments made, the clarity of information presented, or the structure and "appeal" of texts.	30	29	25
270 **2** **230**	Pupils at Level 2 can carry out multipart retrieval processes, such as answering questions that use a modified version of the phrasing in the text. They can also match question content with information in the stimulus text that extends beyond one or two adjacent sentences, provided that the question is an almost literal match with text content. They can combine two pieces of non-adjacent information in the text to infer a response, but their skills at this level are not consistent. They demonstrate integration skills such as identifying overall themes from texts, or drawing on outside knowledge.	33	32	30
229 **1** **183**	Pupils at Level 1 can carry out basic retrieval processes and can match words and phrases in the question with the same words and phrases in the stimulus text to answer items. They can also make low-level inferences, where at least part of the information required for the answer is explicitly stated in the text, or where a discrete piece of explicitly stated text coupled with very basic external knowledge is sufficient to answer the question. Pupils at this level can also engage in some interpretation and integration of information, such as identifying an idea or theme in a section of text. They can identify the rationale behind a piece of text where it is clearly flagged (for example, in the title).	18	22	25
<183	Pupils below proficiency level 1 have a less than 62.5% chance of correctly answering the easiest questions. Their reading skills are very low, relative to other 6th class pupils, and are not properly assessed by this assessment.	4	5	10

Achievement Outcomes

Table 3.14: Percentages of pupils at each proficiency level on the overall mathematics scale by school type, Second class

Level & score range	What pupils can typically do	SLG	GAEL	NA '09
4 **315+**	Pupils at Level 4 can calculate the cost of items which may be bought with a given sum of money, and can calculate the best estimate of the sum or difference of two two-digit numbers. They show understanding of the associative property of addition; the connection between two-step word problems and their corresponding numerical expressions; and the correct use of the symbols =, <, >. They can measure length using metres and centimetres and measure area using a non-standard unit. They can interpret information from a bar-line graph and make a calculation with it. They can solve one-step word problems involving: repeated addition; addition or subtraction of clock times; halves and quarters of metres, kg, and litres. They can solve two-step word problems involving addition and subtraction of two-digit numbers and money.	13	8	10
314 **3** **270**	Pupils at Level 3 can recall the subtraction facts, add a row of three numbers with renaming within 99, and find the difference between two two-digit numbers. They can use the vocabulary of ordinal number, and convert tens and units to numbers from 10 to 199. They can extend number patterns, identify quarters of 2-D shapes, and partition a 2-D shape into two other shapes. They can use the concept of an angle as a rotation, use a calendar to read days, dates, months and seasons, and select appropriate non-standard units for measuring capacity. They can exchange coins. They can also solve: one-step word problems involving: addition or subtraction of two-digit numbers; halves and quarter of sets of up to 20 objects; addition or subtraction of money, cm and m, kg or litres; time in hr and min on 12-hour clock. They can solve one-step and two-step word problems involving minutes, hours and days.	31	34	25
269 **2** **232**	Pupils at Level 2 can be expected to add columns of three numbers with renaming within 99. They can identify odd and even numbers. They can use the symbols +, - to complete number sentences. They can identify halves of sets with up to 20 objects. Pupils at this level can combine two 2-D shapes to make other shapes. They can identify properties of 3-D shapes and compare lengths of objects in non-standard units. Pupils at this level can convert analogue to digital time (to the half-hour), and interpret information in simple block graphs. They can solve one-step word problems involving addition or subtraction of simple whole numbers.	28	29	30
231 **1** **184**	Pupils at Level 1 can be expected to count objects in groups of threes and fives; use ordinal number; locate numbers within specified intervals up to 199; connect verbal and numerical forms of numbers, up to 199; and recall the addition facts. They can use the vocabulary of spatial relations to locate objects; identify and classify simple 2-D and 3-D shapes and list some of their properties. They can identify half of a regular 2-D shape. Pupils at this level can use the vocabulary of time to sequence events, and identify a date in a calendar. They can find the value of a group of coins. They can read a simple block graph.	21	20	25
<184	Pupils below proficiency level 1 have a less than 62.5% chance of correctly answering a Level 1 question. Their mathematical skills are very low, relative to other 2nd class pupils and are not properly assessed by the National Assessments.	8	8	10

Table 3.15: Percentages of pupils at each proficiency level on the overall mathematics scale by school type, Sixth class

Level & score range	What pupils can typically do	SLG	GAEL	NA '09
4 **316+**	Pupils at Level 4 can multiply and divide decimals by decimals, and carry out simple algebraic procedures involving evaluation of linear expressions and one-step equations. They can demonstrate a high level of understanding of signed integers and number theory concepts such as prime and composite numbers. They can deduce symbolic rules for simple functions. At this level pupils can also analyse geometric shapes in detail and deduce rules about them. They can construct circles. They can plot coordinates and use scales on maps or plans to calculate distances and areas. They can solve non-routine and multi-step practical problems involving ratios, mixed numbers, percentage gain or loss, value for money comparisons, currency conversions, speed, and time zones.	9	10	10
315 **3** **273**	Pupils at Level 3 can add and subtract mixed numbers and decimals. They can demonstrate understanding of decimal notation, factors and multiples, exponents, and square roots. They can connect verbal and symbolic representations of word problems. They can construct and measure angles and construct triangles and rectangles given selected sides and angles. Pupils at this level can classify triangles and quadrilaterals based on angle and line properties and rules. They can identify properties of 3-D shapes. They can manipulate commonly used units of area, capacity and weight. They can read, interpret, and analyse pie-charts, multiple-bar bar-charts and trend graphs. They can estimate simple probabilities. They can solve routine and non-routine word problems involving operations with fractions, decimals and percentages, length and perimeter, capacity, and time.	27	32	25
272 **2** **230**	Pupils at Level 2 can multiply fractions and decimals, estimate products, calculate common factors and multiples of whole numbers, and convert fractions and decimals to percentages. They can identify prime numbers within 30 and identify rules for number patterns. They can demonstrate understanding of a letter as a placeholder in algebraic expressions, and complete two-step number sentences involving addition and subtraction. Pupils at this level can construct lines and circles, estimate angles and use properties of shapes to calculate line and angle sizes. They can make logical deductions from simple data sets. They can solve multi-step word problems involving operations with integers, fractions and percentages.	35	32	30
229 **1** **184**	Pupils at Level 1 can add, subtract, and round whole numbers and decimals. They show understanding of whole number notation and can connect numeric and verbal representations of large numbers. Pupils at this level can classify angles and identify templates of simple 3-D shapes. They can manipulate commonly used units of length. They can read and interpret, without calculation, simple frequency tables, pie-charts, bar charts and trend graphs. They can solve routine word problems involving the four operations with whole numbers.	23	22	25
<184	Pupils below proficiency Level 1 have a less than 62.5% chance of correctly answering a Level 1 question. Their mathematical skills are very low, relative to other 6th class pupils and are not properly assessed by the National Assessments.	7	5	10

Mathematics

In Second class, 13% of pupils in SLG performed at Level 4 in mathematics, compared with 8% in Gaeltacht schools and 10% in NA '09 schools (Table 3.14). In a similar vein, 44% in SLG, 42% in Gaeltacht schools, and 35% in NA '09 schools performed at Level 3 or higher (i.e. Level 3 or Level 4). Similar percentages of pupils in SLG and Gaeltacht schools (29% agus 28% respectively) achieved at Level 1 or below, compared with 35% of pupils in NA '09 schools.

In Sixth class, about 10% of pupils in SLG, Gaeltacht schools and NA '09 performed at Level 4 in mathematics (Table 3.15). Forty-two percent in Gaeltacht schools achieved at Level 3 or higher, compared with 36% in SLG and 35% in NA '09. Fewer pupils in SLG (7%) and Gaeltacht schools (5%) performed below Level 1, compared with pupils in NA '09 schools (10%).

Ratings of Pupils' Achievement

Ratings of pupils' achievement were obtained from teachers, parents and pupils in both NAIMS and NA '09. Detailed outcomes are provided in a series of tables in the e-Appendix. Figure 3.1 (below) shows parent ratings for English reading in Sixth class. The charts show that 62% of parents of pupils in SLG and 55% in Gaeltacht schools rated their children as 'very good' at English reading (see dark bars and axis on left-hand side). Further, there is a clear association between parents' ratings and children's achievement in reading. For example, in Gaeltacht schools, children rated as 'very good' by their parents have a mean score of 276, while those rated as 'very weak' (fewer than 1% of students) have a mean score of 191 (see light grey line and right-hand axis).

Figure 3.1: Parent ratings of their child's reading achievement, and mean English reading scores, by school type (Sixth class)

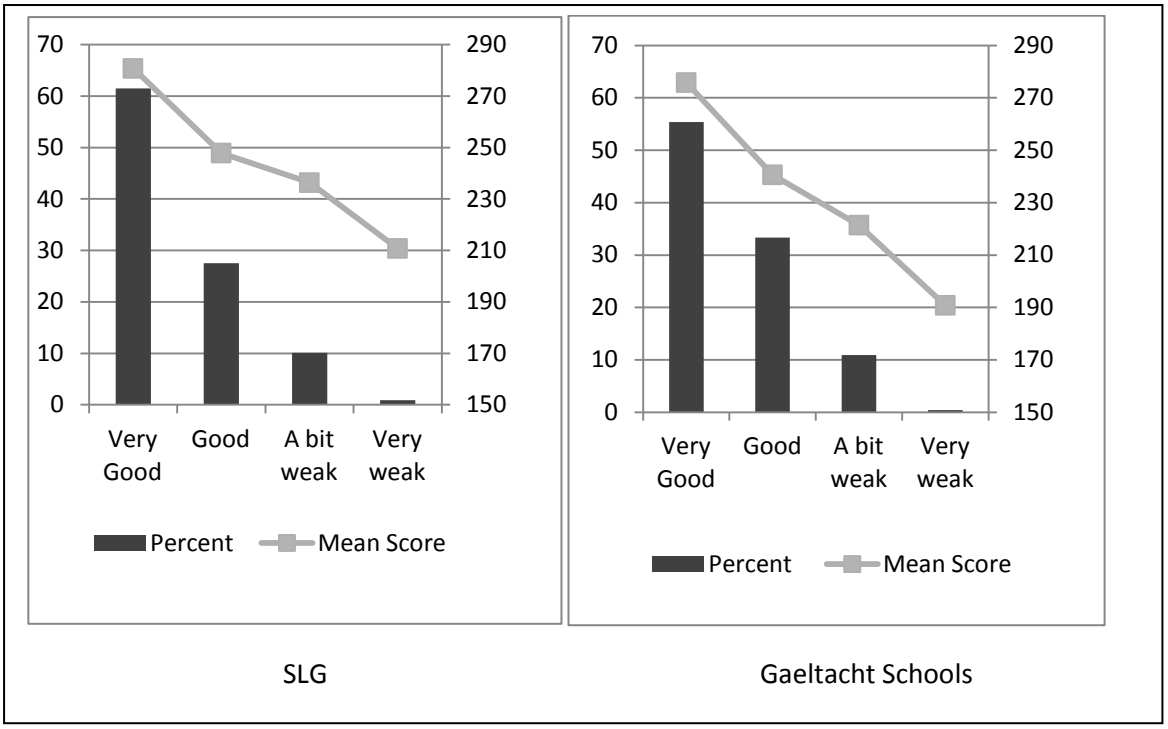
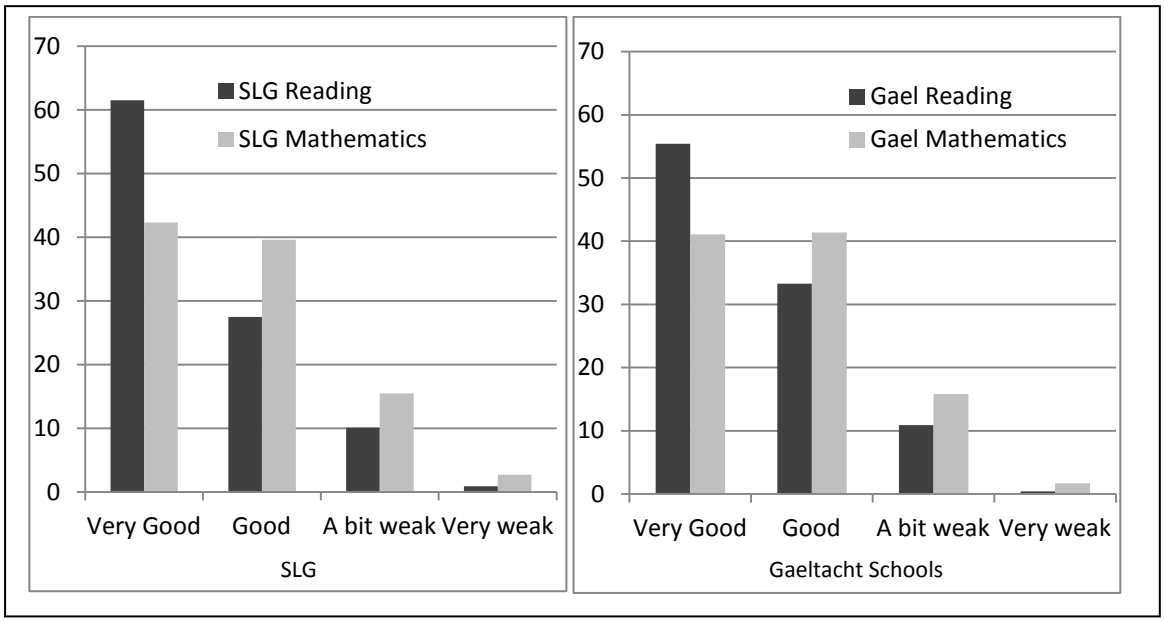


Figure 3.2 contrasts parents' ratings of their children's achievement in English reading and mathematics in Sixth class, by school type. Parents in both school types were less likely to rate their children as being very good at mathematics, compared with English reading. For example, in Gaeltacht schools, 55% of parents rated their child as 'very good' at English reading, whereas 41% did so for mathematics. However, as noted earlier, pupils in Sixth class in Gaeltacht schools had similar mean English reading (257) and mathematics (259) scores.

Figure 3.2: Parent ratings of their child's English reading and mathematics achievement, by school type (Sixth class)



Teachers were asked to indicate whether pupils were performing below their current class level, at their current class level, or above it in English reading and mathematics. Figure 3.3 shows teacher ratings for English and associated mean scores. In both SLG and Gaeltacht schools, a majority of pupils was judged to be performing at their current class level, while 22% in SLG and 17% in Gaeltacht schools were deemed to be performing above their class level. As with parent ratings, mean scores increased in line with higher ratings.

Teachers were less likely to rate pupils as performing above their current class level in mathematics, compared with English reading. For example, while 17% of pupils in Sixth class in Gaeltacht schools were judged to be performing above their current class level in reading, 6% were judged to be performing above class level in mathematics (Figure 3.4).

Figure 3.3: Teacher ratings of pupils' reading achievement, and mean English reading scores, by school type (Sixth class)

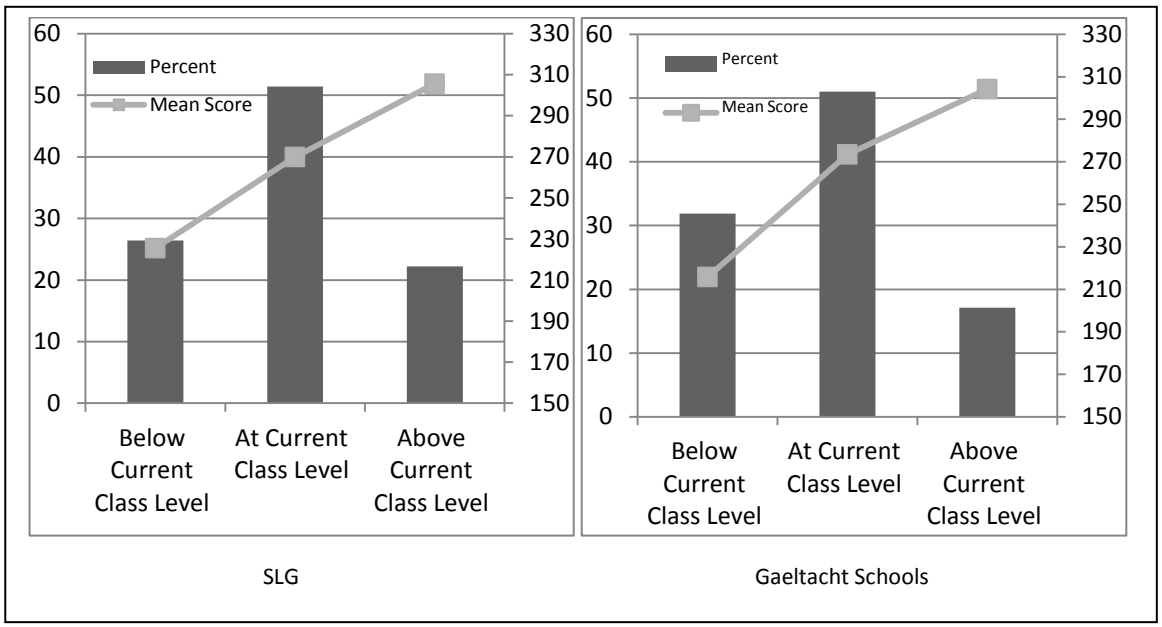
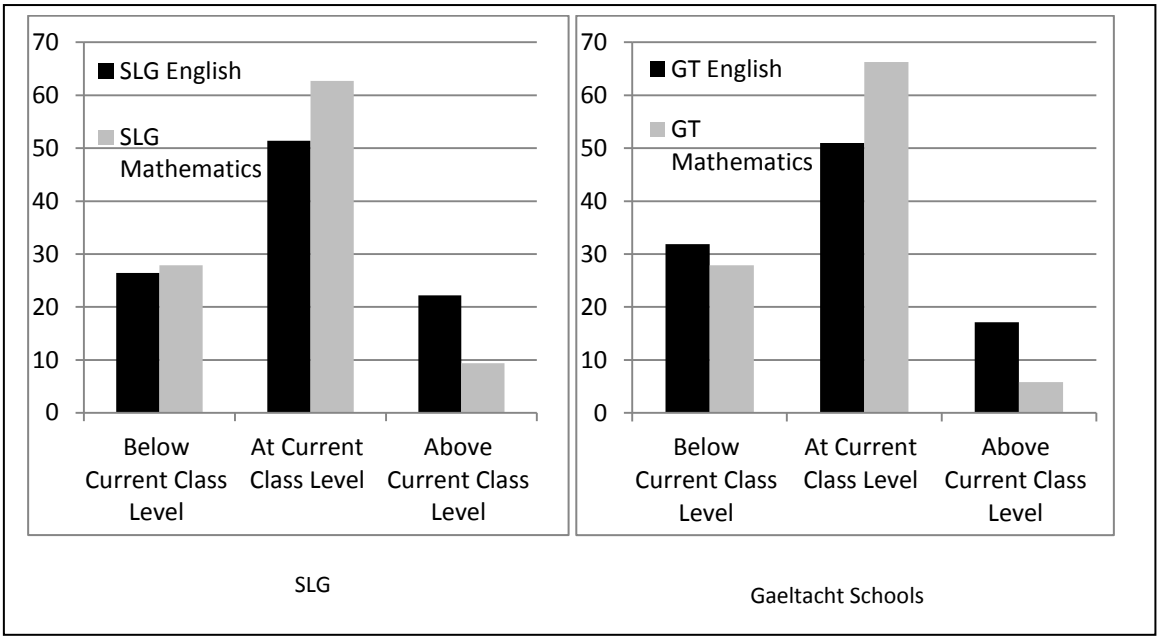
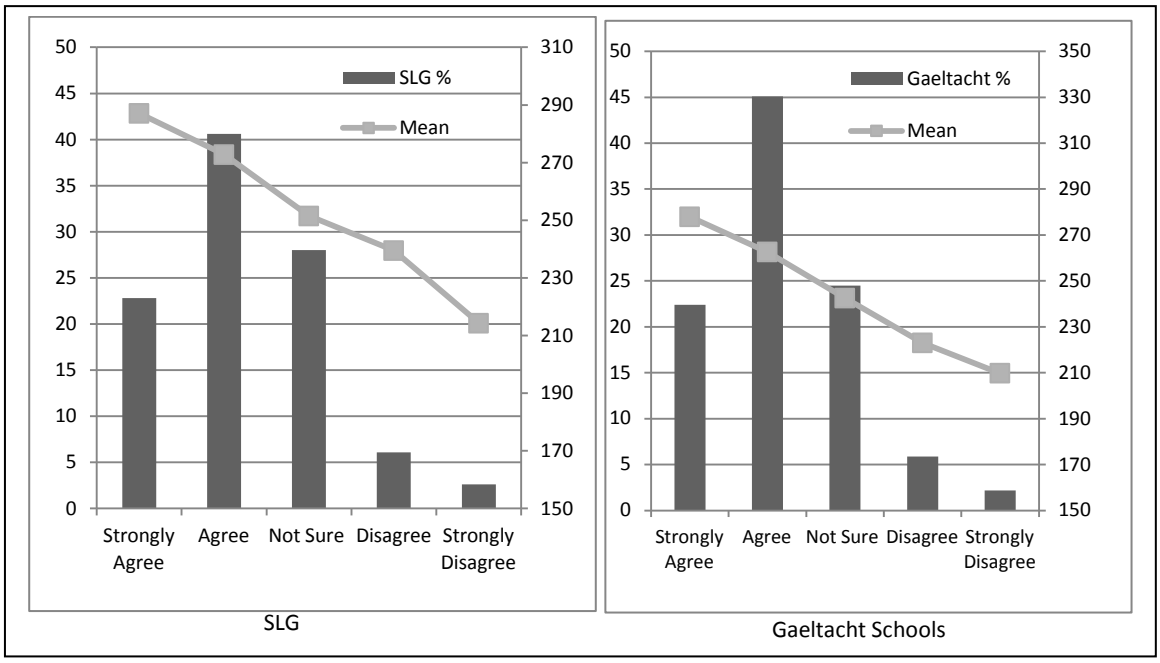


Figure 3.4: Teacher ratings of pupils' performance levels in English reading and mathematics, by school type (Sixth class)



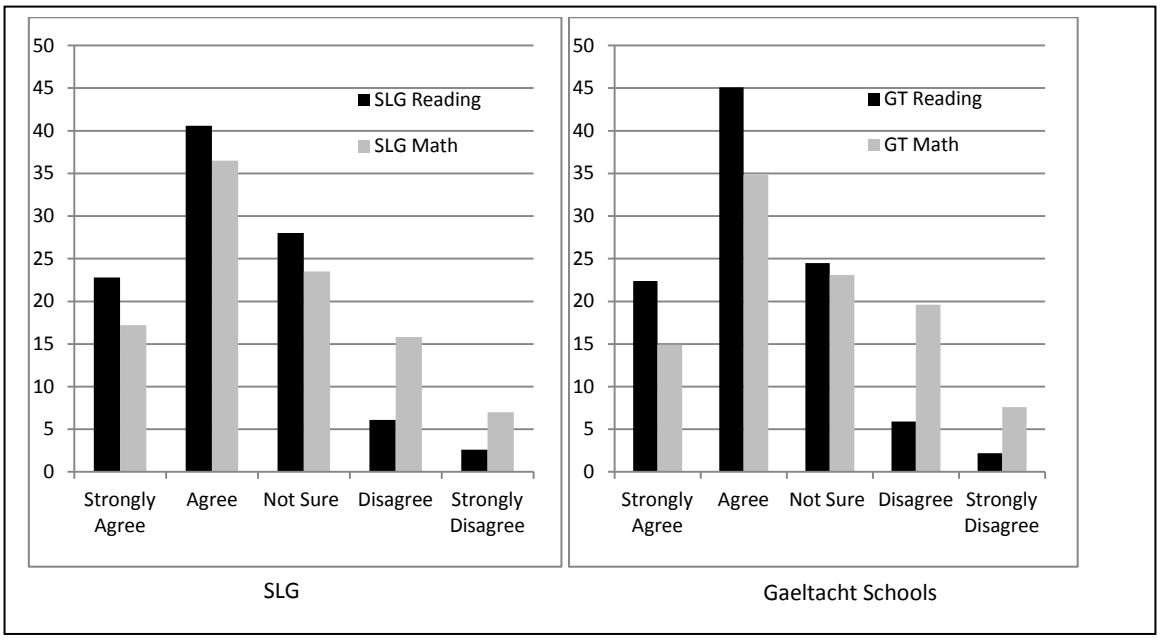
Finally, pupils were asked to rate their own achievements in English reading and mathematics. At Sixth class, they were asked to indicate their agreement with the following statements: 'I am a good reader', and 'I am not very good at maths'. Figure 3.5 shows that relatively few pupils in Sixth class in SLG (9%) or in Gaeltacht schools (8%) 'disagreed' or 'strongly disagreed' that they were good at reading (i.e. a large majority of pupils consider themselves reasonably good at reading). Mean scores show a consistent fall off, as pupils' ratings decline.

Figure 3.5: Percentages of pupils' indicating varying levels of agreement with the statement 'I am a good reader', and mean English reading scores, by school type (Sixth class)



Higher levels of agreement indicate that the pupil considers him/herself to be good at reading.

Figure 3.6: Percentages of pupils indicating varying levels of agreement with statements regarding their ability in reading and mathematics, by school type (Sixth class)



Higher levels of agreement indicate that the pupil considers him/herself to be good at English reading or mathematics.

Figure 3.6 contrasts pupil ratings in English and mathematics (where ratings for mathematics have been reverse-coded so that higher levels of agreement indicate that pupils consider themselves good at mathematics). As with parent and teacher ratings, pupil self-ratings for mathematics are consistently lower than for reading for both SLG and Gaeltacht schools. In SLG, 23% strongly disagreed or disagreed that they were very good at maths, while in Gaeltacht schools, 27% did so. As noted above, the corresponding figures for reading in SLG and Gaeltacht schools were 9% and 8% respectively.

Although not shown here, ratings provided by parents, teachers and pupils were higher for mathematics at Second class, compared to Sixth class (see e-App, Tables E3.1, E3.2 and E3.5). For example, whereas 22% of pupils in Second class in SLG were rated by their teachers as being above their current class level in mathematics, the corresponding estimate for Sixth class was 9%. In Gaeltacht schools, 13% in Second class were rated as performing above their current class level in mathematics, whereas at Sixth class, just 6% were rated in this way.

Key Points

- Pupils in Second and Sixth classes in SLG, and pupils in Sixth class in Gaeltacht schools achieved significantly higher mean scores on English reading than pupils in NA '09. Pupils in Second class in Gaeltacht schools had a mean score that was three points higher than that of pupils in NA '09, but the difference was not statistically significant.
- Girls in Sixth class in Gaeltacht schools had a significantly higher mean reading score than boys. There were no significant differences in English reading between boys and girls in SLG at either Second or Sixth classes, or in Gaeltacht schools at Second class.
- In Second class, pupils in SLG achieved a significantly higher mean score on mathematics than pupils in NA '09, while the mean scores of pupils in Gaeltacht schools and NA '09 were not significantly different. In Sixth class, pupils in Gaeltacht schools achieved a significantly higher mean score than pupils in NA '09, while the mean scores of pupils in SLG and NA '09 were not significantly different from one another. The mean scores of pupils in SLG and Gaeltacht schools were not significantly different from one another at either class level.
- Boys in Second and Sixth classes in SLG but not in Gaeltacht schools achieved significantly higher mean scores in mathematics than girls.
- Although pupils in Second class in both SLG and Gaeltacht schools taking the mathematics test in English achieved higher mean scores (by 20 and 10 points respectively) than pupils taking the test in Irish, differences were not statistically significant. At Sixth class, there was little difference between the mean scores of pupils who took the test in English compared to those who took the test in Irish.
- The percentage of pupils in Second class in SLG who performed at Level 4 on the English reading proficiency scale (17%) was greater than in Gaeltacht schools or NA '09 schools (10% in both). Similarly, fewer pupils (21%) in Second class in SLG performed at Level 1 or below, compared with pupils in Gaeltacht schools (32%) and NA '09 (35%). At Sixth class, fewer pupils in SLG or Gaeltacht schools (4% and 5% respectively) performed below Level 1, compared with 10% in NA '09.

- Forty-four percent of pupils in SLG, 42% in Gaeltacht schools, and 35% in NA '09 performed at Level 3 or 4 in Second class mathematics, while 8%, 8% and 10% respectively performed below Level 1. In Sixth class mathematics, more students in Gaeltacht schools (42%) than in SLG (36%) or NA '09 schools (35%) performed at Level 3 or 4. Marginally fewer pupils in Gaeltacht schools (5%) and SLG (7%) performed below Level 1 compared to NA '09 (10%).
- Ratings of achievement in reading provided by parents, teachers and pupils were associated with performance on the NAIMS reading test, with average performance dropping as ratings lowered. Ratings for mathematics were consistently lower than for reading. Ratings were, on average, lower at Sixth classes than at Second, particularly in the case of mathematics.

Chapter 4
A Profile of Pupils and their Families

This chapter describes some of the characteristics of the pupils who participated in NAIMS and considers some features of their home environments. Where relevant, comparisons are made with findings from the 2009 National Assessments (NA '09; Eivers et al., 2010a). This chapter is primarily descriptive; more complex multi-variate analyses of the associations between achievement and various pupil and family characteristics will be presented in Chapter 7. In general, data for both Second and Sixth class levels are provided in this chapter, or, where only one grade level is discussed, data for the other are provided in e-Appendix 4; an exception to this is the section on reasons for selecting an Irish-medium primary school and expectations for post-primary school which specifically focuses on Sixth class pupils and their parents.

There are four main sections in this chapter. First, characteristics of the family – such as parental employment – are described. Second, the educational climate of the home is discussed. This refers to the supports available to pupils at home, such as help with homework and access to books. Third, parents' and pupils' attitudes towards, and use of, the Irish language are considered. The fourth section presents reasons given by parents for selecting an Irish-medium school and describes pupils' engagement in education generally, as well as pupils' and parents' intentions for post-primary schooling.

Family Characteristics

In the parent questionnaire, respondents were asked to indicate their own (current or most recent) job and that of their partner. They were advised to give their last job in cases where they or their partner were currently unemployed. Responses to these questions were coded by trained coders using the International Socioeconomic Index (ISEI; Ganzeboom, De Graaf & Treiman, 1992) which is designed to capture "income and educational differences between occupational categories" (p.15). Scores on the ISEI scale range between 16 and 90. Occupations which are assigned low ISEI scores include domestic cleaners and farm labourers while barristers, medical doctors and judges are among those assigned the highest ISEI scores. For the present analyses, pupils who had two ISEI scores, i.e. one for each parent, were assigned the higher of the two values.[11] In this report, pupils' ISEI scores are referred to as SES scores.

At both Second and Sixth class, the mean socioeconomic status (SES) of pupils attending Scoileanna Lán-Ghaeilge (SLG) was significantly higher than that of pupils attending Gaeltacht schools and primary schools in Ireland generally.[12] Differences in

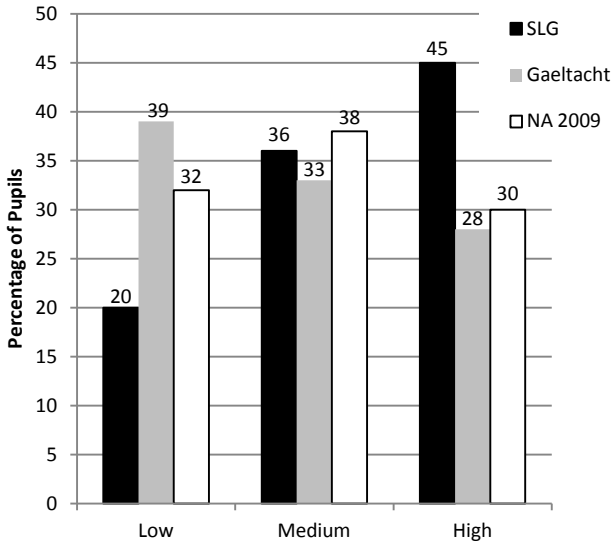
[11] Inspectors who observed the administration of NAIMS indicated that in a small number of parent questionnaires may have been allocated incorrectly (see Chapter 2). This does not impact on the percentages of pupils in various socioeconomic status categories but may be of relevance when examining associations between SES and achievement at the individual pupil level.

[12] Details of tests of statistical significance are provided in the e-Appendix.

favour of SLG pupils ranged from 5 to 7 points, which represents between one-third and one-half of a standard deviation.[13]

Figure 4.1 shows the percentages of Sixth class pupils in SLG, Gaeltacht schools and schools generally classified as being from low, medium and high SES families.[14] Just 20% of Sixth class SLG pupils came from families with a low SES – a markedly lower percentage than in Gaeltacht schools (39%) or in schools nationally (32%) (Figure 4.1). The corresponding percentages of pupils at Second class from low SES families were 25% in SLG, 44% in Gaeltacht schools and 36% in NA '09. Conversely, 45% of Sixth class pupils and 45% of Second class pupils in SLG came from a high SES background – substantially higher percentages than in Gaeltacht schools (Sixth: 28%; Second: 30%) and in schools generally (Sixth: 30%; Second: 31%).

Figure 4.1: Percentages of Sixth class pupils from high, medium and low socioeconomic status families



Comparing the achievement of low SES pupils in SLG and NA '09

Low SES pupils in Sixth class in SLG had a significantly higher mean reading score than low SES pupils in Sixth class in NA '09. The difference amounted to 17 points which is equivalent to about one-third of a standard deviation.

There was no significant difference in the mean mathematics score of low SES pupils in Sixth class in SLG and that of low SES pupils in NA '09. Furthermore, differences at Second class were not statistically significant.

In line with findings from NA '09, higher familial SES was associated with significantly higher levels of achievement. At Second and Sixth class in both SLG and Gaeltacht schools, pupils from high SES families achieved a significantly higher mean reading score than pupils from low SES families. Similarly, pupils from medium SES families had significantly higher mean reading scores than pupils from low SES families.[15]

Turning to achievement in mathematics, significant differences were found in SLG at both Second and Sixth class between the mean scores of pupils from low and high SES families. The difference in mean scores between pupils from low and

[13] In the 2009 National Assessments, the standard deviation on the ISEI scale at Second class was 15.5 and at Sixth class 16.3. The following standard deviations on the ISEI scale were found in Irish medium schools: SLG: Second class 15.3, Sixth class 15.4; Gaeltacht schools: Second class 16.8, Sixth class 16.0.

[14] The categories of high, medium and low socioeconomic status were defined for Second and Sixth class separately in NA '09; these same categories were used for the present study. In NA '09, two cut-points on the SES scale were identified at each grade level such that roughly one-third of pupils at that grade level had SES values below the lower cut-point, approximately one-third were between the two cut-points and one-third were above the higher cut-point.

[15] The difference in the mean reading achievement of pupils from medium SES families and those from low SES families was not statistically significant in Gaeltacht schools at Second class.

medium SES families was also statistically significant, in favour of pupils from medium SES families. The relationship between socioeconomic status and mathematics achievement in Gaeltacht schools was less robust: the only difference which was statistically significant was the difference in the average mathematics achievement of Sixth class pupils from low and high SES families.

A large majority of pupils across all school types lived in homes where at least one parent was in employment, although the percentages in SLG (91% at both Second and Sixth class) were somewhat higher than in Gaeltacht schools (Second: 84%; Sixth: 82%) (Table 4.1). The prevalence of single-parent families was similar across all school types: about 20% of pupils in NA '09 lived in single-parent families while the percentages in Irish-medium schools ranged from 15% of Second class pupils in Gaeltacht schools to 21% of Sixth class pupils in SLG.

Table 4.1: Family characteristics of Second and Sixth class pupils, by school type and grade level

		2nd class (% of pupils)			6th class (% of pupils)		
		SLG	Gaeltacht	NA '09	SLG	Gaeltacht	NA '09
Parent employed	Yes	91	84	86	91	82	87
	No	9	16	14	9	18	13
Single parent family	Yes	17	15	21	21	17	20
	No	83	85	79	79	83	80
No. of siblings	0 to 3	93	89	91	89	83	83
	4 or more	7	11	9	11	17	14
Born in Ireland	Yes	93	89	86	94	87	85
	No	7	11	14	6	13	15

At each grade level, a large majority of pupils had three or fewer siblings. At Sixth class, one in six Gaeltacht pupils were reported to have four or more siblings compared to one in nine SLG pupils (Table 4.1).

Just 6% of Sixth class SLG pupils were born outside of Ireland, compared to 13% of Sixth class pupils in Gaeltacht schools and 15% nationally. Percentages were similar at Second class (Table 4.1).

Not surprisingly, English was reported to be the most widely spoken home language in NA '09. At least 90% of pupils at both Second and Sixth class indicated that it was the main language spoken in their homes. English was also the most widely spoken home language of the majority of pupils in SLG and Gaeltacht schools: almost all SLG pupils (Sixth: 98%; Second: 94%) and about three-quarters of pupils in Gaeltacht schools (Sixth: 74%; Second: 78%) reported that English was the language they spoke most often at home (Table 4.2, see also Table 4.8).

Very few SLG pupils reported that Irish was the main language in their homes (Second: 4%; Sixth: 2%) whereas one-fifth to one-quarter of pupils in Gaeltacht schools reported that this was the case. (Parental use of Irish is discussed later in this chapter.) Although languages other than Irish or English were spoken by a small minority of pupils in NA '09 (9% of Second class and 5% of Sixth class pupils), it was rare for pupils in Irish-medium schools (fewer than 2%) to report speaking a language other than English or Irish as their main home language (Table 4.2).

Table 4.2: Language spoken most often at home, by school type and grade level

	2nd class (% of pupils)			6th class (% of pupils)		
	SLG	Gaeltacht	NA '09	SLG	Gaeltacht	NA '09
English	94	78	90	98	74	94
Irish	4	20	1	2	24	1
Other	2	2	9	<1	2	5

For the most part, in Irish-medium schools, there were no statistically significant associations between home language and achievement in English reading. However, in Gaeltacht schools at Sixth class, pupils who reported speaking English at home had a significantly higher mean reading score than pupils who reported speaking Irish as well as pupils who spoke languages other than English or Irish (e-App., Table E4.5) (though note that the latter group accounts for just 2% of Sixth class pupils in Gaeltacht schools). The gap between the mean score of Sixth class pupils in Gaeltacht schools who spoke English and those who spoke Irish was 16 points, while a larger gap of 68 points was found in favour of those who spoke English compared to other languages.

Home Atmosphere and Supports

This section describes the homework practices of pupils, including the time spent on homework and the help they receive; parental engagement with their child's school; and the educational climate in pupils' homes.

Homework

Parents reported that a majority of pupils received English homework four or five times a week; this was the case for about 90% of Second class pupils and 70 to 80% of Sixth class pupils (Table 4.3). In both SLG and Gaeltacht schools, Second class pupils received English homework more frequently[16] than did Sixth class pupils but they spent comparatively less time completing it (12-15 minutes at Second versus 19-20 minutes at Sixth, Table 4.3).

Table 4.3: Homework frequency and time spent on homework, by school type and grade level

	2nd class			6th class		
	SLG	Gaeltacht	NA '09	SLG	Gaeltacht	NA '9
English homework 4 or 5 times per week (%)	94	88	90	83	71	82
Irish homework 4 or 5 times per week (%)	92	83	–	87	70	–
Average number of days of English homework per week	4.1	4.1	4.1	3.9	3.8	4.0
Time spent on English homework on a typical school day (minutes)	12	15	17	19	20	21
Average number of days of Irish homework per week	4.0	4.0	–	4.0	3.7	–
Time spent on Irish homework on a typical school day (minutes)	12	14	–	18	20	–

Note: Pupils in NA '09 were not asked about Irish homework.

Parents of pupils in Irish-medium schools only were asked about the frequency with which their child got Irish homework. As with English homework and as might

[16] The average number of days of English homework is statistically significantly greater at Second class than at Sixth in Irish-medium schools but the difference is not statistically significant in NA '09.

be expected, parents reported that Second class pupils spent a comparatively shorter period of time on Irish homework than their Sixth class counterparts (12-14 minutes on average at Second class compared to 18-20 at Sixth class). In Gaeltacht schools only, the difference in frequency of Irish homework between Second and Sixth class is statistically significant, with homework given on average on a greater number of days at Second class than Sixth class (Table 4.3).

Parents of pupils in Irish-medium schools were more likely to report that their child did not need help with English homework than parents of pupils who participated in NA '09; e.g. at Second class, roughly one-quarter of pupils in Irish-medium schools were reported not to need help compared to fewer than one-tenth of pupils in NA '09. For those pupils who received assistance with homework, mothers were the most common source of help in SLG, Gaeltacht schools and in NA '09 (e-App. Tables E4.8 to E4.11).

Parents of pupils in Irish-medium schools typically reported high levels of confidence in assisting with English homework. Roughly 85% of parents of Second class pupils and 70% of parents of Sixth class pupils indicated that they were *very confident* in this regard, considerably higher than the corresponding figures in NA '09 (72% and 58% respectively) (e-App. Tables E4.12 to E4.15).

Parents reported lower levels of confidence in their ability to help with Irish homework. Of Sixth class SLG pupils whose parents responded to the question regarding confidence in helping with Irish homework, just 28% had parents who reported that they were *very confident* in their ability to help with Irish homework; the corresponding figure for Gaeltacht schools was 43% (Table 4.4). At Second class, the difference between SLG and Gaeltacht parents was less marked (42-50% of pupils had parents who were *very confident* in helping with Irish homework). Across both school types and grade levels, between one-fifth and one-third of pupils had parents who reported that they were *not very* or *not at all* confident in helping with Irish homework (see also Figure 4.3).

Table 4.4: Parental confidence in helping with Irish homework: Percentage of pupils in SLG and Gaeltacht schools[1] whose parents indicated varying levels of confidence

	2nd class		6th class	
	SLG	Gaeltacht	SLG	Gaeltacht
	%	%	%	%
Very confident	42	50	28	43
Fairly confident	38	28	27	31
Not very confident	16	13	25	15
Not at all confident	4	8	10	11

[1]Not asked in NA '09

Parental engagement with school

Parents were asked whether or not they had ever attended a course or information evening aimed at helping their child with various subjects.[17] A small minority of parents across all categories of school (5 to 8%) reported that they had attended an

[17] Chapter 5 presents data on the percentages of pupils in schools where principals indicated that there were programmes in place to support parents in helping their children with English reading, mathematics and Irish reading.

information evening aimed at helping their child with English or mathematics (Table 4.5). Compared with their attendance at English courses and also relative to parents of pupils in Gaeltacht schools, parents of SLG pupils were more likely to indicate that they had attended a course or information evening designed to help their child with Irish (16% – 19%).

Table 4.5: Parental attendance at information evenings, by school type and grade level

	SLG %	Gaeltacht %	NA '09[1] %
2nd Class			
English	5	5	8
Maths	2	4	5
Irish	19	8	–[2]
6th Class			
English	6	4	5
Maths	4	5	5
Irish	16	8	–[2]

[1]Based on pupils participating in the reading assessment

[2]Question not asked in this assessment

In both NA '09 and in NAIMS, majorities of parents reported that they had discussed their child's progress at school with his/her teacher in the current school year. Roughly 90% of parents indicated that they had discussed their child's progress in English. In Irish-medium schools only, parents were also asked whether or not they had discussed their child's progress in Irish with his/her teacher (e-App. Table E4.16). High percentages of pupils had parents who reported having discussed progress in Irish, ranging from 84% of pupils in Sixth class to 93% of Second class pupils in Gaeltacht schools. Percentages were similar in SLG.

Home environment

Findings from NA '09 provide evidence of a strong association between a supportive home environment and success in reading and mathematics. This section examines the home environments of pupils in Irish-medium schools and compares their home supports to those of pupils participating in NA '09.

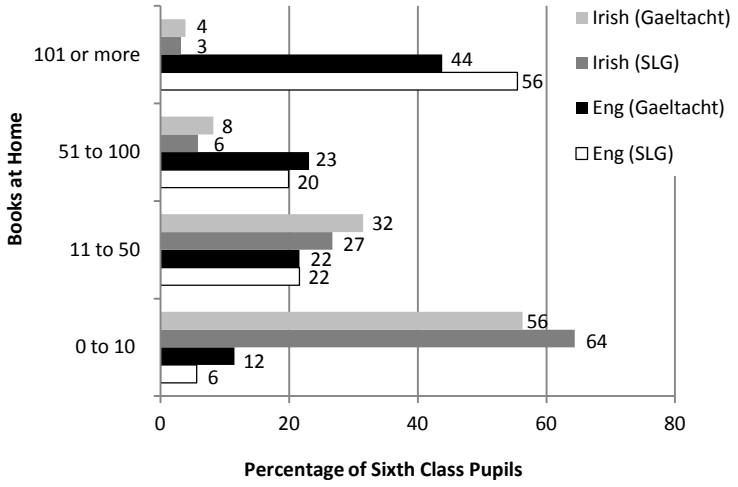
Parents were asked to estimate the numbers of books in their homes, based on having roughly 50 books per metre of shelving. Parents of pupils in Irish-medium schools were asked to distinguish between Irish and English books, a distinction not made in NA '09. Figure 4.2 shows that there were notable differences between the access which pupils had to English and Irish books and also between pupils in SLG and Gaeltacht schools in terms of the numbers of books at home. Although only data for Sixth class are shown, findings were similar for Second class (see e-App. Table A4-17 for Second class data).

Very few Sixth class SLG pupils (6%) had 10 or fewer English books at home, although almost two-thirds had 10 or fewer Irish books at home (64%, Figure 4.2). A similar picture was evident in the homes of pupils attending Gaeltacht schools, where just 11% of Sixth class pupils had 10 or fewer English books at home but 56% had 10 or fewer Irish books.

At both class levels, SLG pupils had a significantly higher average number of English books at home than pupils in Gaeltacht schools. The difference at Second class was about 30 books and at Sixth class, about 40 books. Pupils in Gaeltacht

schools tended to have a higher number of Irish books at home than SLG pupils but the differences were not statistically significant (e-App., Table E4.18).

Figure 4.2: Percentages of Sixth class pupils with varying numbers of English and Irish books at home, SLG and Gaeltacht schools



Access to books at home

While a tiny minority of pupils (less than 1% at both Second and Sixth) were reported to have ***no English books*** at home, about 12% of Sixth class pupils in SLG and 9% in Gaeltacht schools had ***no Irish books*** at home.

Looking at the percentages with 10 or fewer Irish books, up to two-thirds of Sixth class pupils were in this category.

In line with the findings of NA '09 which indicated that pupils with higher numbers of books at home achieved significantly higher average reading scores, a positive association was found between the numbers of English books at home and the English reading achievement of pupils in SLG and Gaeltacht schools. The association was statistically significant for both Second and Sixth classes in SLG but only at Sixth class in Gaeltacht schools (e-App., Table E4.19). The number of Irish books at home was not significantly associated with English reading achievement (e-App. Table E4-20).

Having a higher numbers of books at home was also positively associated with achievement in mathematics in both SLG and Gaeltacht schools. At Sixth class, SLG pupils whose parents indicated that they had over 500 English books at home achieved an average score of 270 points compared to an average of 225 points for pupils who had between zero and ten books (e-App. E4.21). The difference was similar at Sixth class in Gaeltacht schools and at Second class in SLG. However, no significant association was found between English books at home and mathematics achievement at Second class in Gaeltacht schools.

Across both grade levels and in SLG, Gaeltacht schools and schools participating in NA '09, at least 70% of pupils lived in homes where somebody was a member of a public library (Table 4.6). In line with findings from NA ', pupils in Irish-medium schools from homes with a library member achieved a significantly higher average reading score than pupils from homes with no library member. Differences in reading achievement in favour of pupils from households with a library member were statistically significant at Second class in both SLG and Gaeltacht schools and at Sixth class in SLG only (e-App. Table E4.22).

In excess of 90% of pupils were reported to have a quiet place in which to study (Table 4.6). At Sixth class, in both SLG and Gaeltacht schools, these pupils achieved a significantly higher reading score than pupils who were reported not to have a quiet place to study (e-App. Table E4.24). The difference was also significant in NA '09.

Parents were asked to indicate whether or not their children had access at home to reference books such as a dictionary or encyclopaedia, and educational games (including software). Two-thirds to three-quarters of pupils were reported to have both of these in their homes while fewer than one in ten had access to neither (Table 4.6). As in NA '09, pupils in both grades in Irish-medium schools who were reported to have access to both reference books and educational games achieved significantly higher mean reading scores than pupils who had access to neither. In general, pupils who had one of the above resources also achieved higher average reading scores than those who had none but in some grades and school types the differences in mean achievement between those with one resource and those with none were not statistically significant (see e-App. Tables E4.26 for reading, and E4.27 for maths).

Table 4.6: Percentages of pupils with selected home educational resources, by school type and grade level

		2nd			6th		
		SLG %	Gael %	NA '09 %	SLG %	Gael %	NA '09 %
Library member	Yes	86	70	75	90	71	79
	No	14	30	25	10	29	21
Quiet place to study	Yes	94	95	93	97	93	94
	No	6	5	7	3	7	6
Educational resources (ref. books & educ. games)	Both	78	68	65	73	67	66
	One	18	24	26	24	30	27
	None	4	8	9	2	3	7

Eivers et al. (2010a) reported that a majority of pupils (62% at Sixth class and 53% at Second) participating in NA '09 had a TV in their bedroom. The percentages are somewhat lower among pupils in Irish-medium schools where about 50% of Sixth class pupils and 46% of Second class pupils (in both SLG and Gaeltacht schools) indicated that they had a TV in their bedroom (e-App. Table E4.28).

The association between reading achievement and having a TV in the bedroom found in NAIMS is very similar to that documented in NA '09. At both grades and in both SLG and Gaeltacht schools, those without a TV in their bedroom scored between 20 and 30 points higher in reading on average than those in possession of a TV (e-App. Table E4.28) (see e-App. Table E4.29 for mathematics scores).

At Second class in SLG, 52% of boys reported having a TV in their bedrooms compared to 40% of girls. There was no evidence of a gender difference at Second class in Gaeltacht schools: 46% of Second class boys and the same percentage of girls reported having a TV in their bedroom. At Sixth class, 55% of boys and 47% of girls in SLG indicated that they had a TV in their bedroom. The corresponding figures in Gaeltacht schools were 60% and 46% respectively.

Similar to findings from NA '09, pupils from a lower socioeconomic background were more likely to have a TV in their bedroom. In SLG, at Sixth class,

three-quarters of low SES[18] boys reported having a TV in their room (e-App. Table E4.30). The corresponding figure in Gaeltacht schools was 66%. Of Sixth class boys from high SES families, 41% in SLG and 35% in Gaeltacht schools had a TV in their bedroom.

Parents, Pupils, and the Irish Language

This section presents findings related to parental ability to speak Irish and the frequency with which they used the language. It also outlines findings related to pupils' attitudes towards the use of Irish.

Parental experience and use of Irish

The parent questionnaire included two questions asking about parents' ability to speak Irish and their frequency of using spoken Irish. These two questions were worded in a very similar way to corresponding questions on the 2006 Census in Ireland. An additional question on the parent questionnaire asked about the level of proficiency in Irish (not specifically spoken Irish) of respondents and their partners. Four possible response options ('*Very good', 'Good', 'Fairly good*', and '*Weak*') were provided. Box 4.1 discusses some of the issues which arise when using questionnaires to elicit data on language proficiency.

A minority of pupils lived in homes where neither parent spoke Irish.[19] The percentages of SLG pupils at Second and Sixth class in homes where neither parent could speak Irish were 21% and 39% respectively (e-App. E4.31). Unsurprisingly, the percentages were lower in Gaeltacht schools: at Second class, just 13% of pupils lived in homes where neither parent spoke Irish; at Sixth class, the corresponding figure was 17% (e-App. Table E4.32, Sixth class shown in Figure 4.3).

Parents also gave details on how often they spoke Irish and whether or not they used Irish inside or outside the education system.[20] For each pupil, the higher of the two parents' responses was taken (e.g. if one parent spoke Irish weekly and the other spoke Irish less often, that pupil was assigned a value of weekly for parental use of Irish) or, if missing data for one parent, analyses were based on data provided for the non-missing parent/guardian. For the category of 'daily inside and outside the education system,' it may be the case that one parent spoke Irish inside the education system and the other spoke Irish outside, or it may be the case that one parent used the language both inside and outside the education system; in both instances, pupils were assigned a value of 'daily inside and outside the education system'.

[18] Recall that cut-points were derived for the 2009 National Assessments which categorised approximately one-third of pupils as low SES, one-third as medium and one-third as high. The same cut-points were used for the current study in order to allow comparisons across the assessments in the percentages of pupils at each level.
[19] A pupil who was missing data for one parent and had data from one parent who indicated that he/she did not speak Irish was included in the category 'neither parent', although strictly speaking it is not known whether or not the absent parent spoke Irish.
[20] This question was taken from the 2006 Census (*http://www.cso.ie/census/documents/censusform_2006.pdf*, last verified 1.03.2011).

Box 4.1: Complexities of using survey data in determining language proficiency

Haselden (2003) discusses two surveys of Welsh language usage which produced quite different estimates in the numbers of people with varying levels of language skills. She examined the 2001 Census and the Welsh Local Labour Force Survey (WLLFS, 2001/2002). Both surveys asked questions on whether the respondent could understand, speak, read and/or write Welsh. The Census asked respondents to tick all that applied from among 'Understand spoken Welsh', 'Speak Welsh', 'Read Welsh', 'Write Welsh', and 'None of the above'. The WLLFS presented respondents with a series of dichotomous questions asking whether or not they could understand, speak, read or write Welsh. Haselden (2003) notes that the estimates produced by the WLLFS were appreciably higher than Census figures; e.g. 35% of respondents aged three and over indicated that they understood spoken Welsh in the WLLFS compared to 24% in the Census. The differences in item-design between the two surveys is likely to be a major factor in accounting for the variation in outcomes although Haselden does not discuss this issue; e.g. Smyth, Dillman, Christian and Stern (2006) found that respondents endorsed more options and took longer to answer in a forced-choice format than in a check-all format. Haselden suggests that the positioning of the language question in the WLLFS directly after a question on national identity and before a question on ethnicity may have been relevant. Furthermore, she concludes that the WLLFS estimates are more likely than the 2001 Census estimates to be inclusive of people with limited language skills.

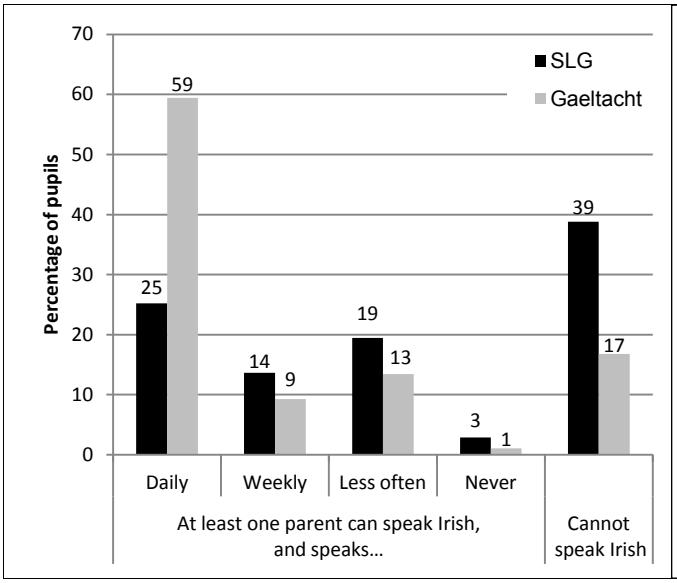
Ó Riagáin (1997; 2011) discusses similar issues in the Irish context. He discusses a national language survey conducted in 1983 which asked respondents about their level of Irish ability and also to indicate how they had responded to the 1981 Census question on ability to speak Irish. He notes that while 100% of those who indicated that they had native speaker ability in the 1983 survey also said that they had identified themselves as speakers of Irish in the 1981 Census, just 59% of those who indicated that that they could manage 'parts of conversations' had been returned as Irish-speakers in the Census (Ó Riagáin, 1997, p.149). Thus, the 1981 Census may have under-estimated the proportion of the population with at least some proficiency in Irish.

Issues raised by Haselden (2003) and Ó Riagáin (1997, 2011) which are relevant to the current analyses include:

- What does it mean to speak a language? Speakers may understand a few words or be fluent in the language. Interpretation of terms describing levels of proficiency such as 'very good', 'fairly good' and 'weak' may vary across respondents. The issue of what respondents mean when they say they speak a language becomes even more complex if issues of national identity are involved; a survey respondent may wish to indicate some level of proficiency in the national language through a sense of patriotism.
- It is likely that the proportion of respondents who understand a language will be higher than the proportion that indicates that they speak a language. Presenting respondents with response options which refer to a continuum of language ability may facilitate greater inclusion of those with lower levels of ability than if a dichotomous question is used. Haselden (2003) focuses on a question which asked 'Do you speak Welsh? If "yes", is that fluently?'. The answer categories were 'Yes, fluently', 'Yes, not fluently', 'No'. This question gave a higher estimate of the proportion speaking Welsh as it allowed those who were less fluent to be included in the overall 'Yes' group.
- Haselden (2003) notes the impact of changing question wording from 'Can you…' to 'Do you speak Welsh?'. This issue is relevant to NAIMS, where at Second class, the question on parental ability to speak Irish was phrased in the English version of the parent questionnaire as it had been phrased in the 2006 Census, i.e., 'Can you speak Irish?'. At Sixth class, the question read 'Do you speak Irish?'. Thus it is possible that at Sixth class, a parent who could speak Irish but did not might tick 'no'.
- The issue of proxy data was also discussed by Haselden (2003). She notes that proxy responses vary significantly from those given in person. The majority of parent questionnaires in NAIMS were completed by mothers; thus estimates of Irish language proficiency of fathers may be less reliable.

For the current section, parents who indicated that they could not speak Irish were excluded from further analyses that examined parental frequency of speaking Irish as it is difficult to interpret the frequency of speaking if the respondent indicated that they cannot speak the language.

Figure 4.3: Percentages of Sixth class pupils who have at least one parent or guardian who speaks Irish daily, weekly, less often or never, SLG and Gaeltacht schools



Parental use of Irish and confidence in helping with Irish homework

Parents who reported speaking Irish on a daily basis tended to be more confident in their ability to help their child with Irish homework. Looking at Sixth class SLG pupils, 85% of parents who reported speaking Irish on a daily basis were confident or very confident in their ability to help with Irish homework compared to 44% of those who never spoke or could not speak the language.

Among Sixth class pupils in Gaeltacht schools, almost 90% of parents who spoke Irish daily were confident or very confident helping with Irish homework compared to 31% of those who were unable to or never spoke the language.

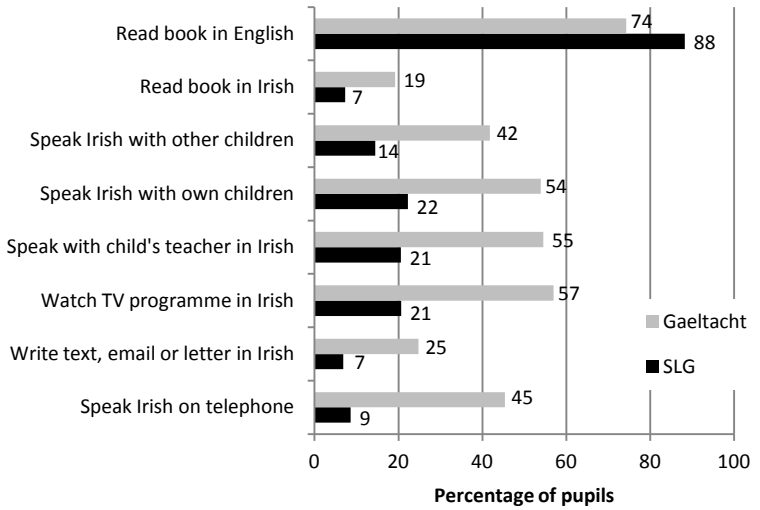
Figure 4.3 shows the percentages of pupils in homes where neither parent spoke Irish and also the percentage with at least one parent who could speak Irish and spoke it on a daily, weekly, or less frequent basis. The category of 'daily' includes pupils with at least one parent who indicated that they spoke Irish on a daily basis exclusively within the education system, those with at least one parent who spoke Irish exclusively outside the education system and also those whose parent(s) spoke the language both inside and outside the education system on a daily basis. About 60% of Sixth class pupils in Gaeltacht schools came from families where Irish was spoken on a daily basis (either inside and/or outside the education system) compared to 25% of SLG pupils. At Second class, the corresponding figures were 55% and 33% respectively.

As noted above, parents provided detail on the locations in which they spoke Irish, i.e., whether they spoke Irish inside or outside the education system. A higher percentage of parents of pupils in Gaeltacht schools reported speaking Irish on a daily basis outside of the educational system: while 22% of Sixth class pupils in the Gaeltacht had a parent who reported speaking Irish on a daily basis outside the education system, and not on daily basis inside the education system, only 10% of Sixth class SLG pupils were in this category (e-App. Table E4.32). Similarly, 29% of Sixth class pupils in the Gaeltacht had a parent who reported speaking Irish on a daily basis both inside and outside the education system; the corresponding figure in SLG was just 7%. Looking at the percentages of parents who reported using Irish on a daily basis exclusively within the educational system, percentages are similar among pupils in Gaeltacht schools and SLG (8% and 9% respectively at Sixth class, 10% and 12% at Second class).

Some variation was also found between Gaeltacht schools and SLG in the percentages of parents engaging in various activities involving the Irish language. Figure 4.4 shows that substantially higher percentages of parents in Gaeltacht schools

reported regularly engaging in activities involving the Irish language; e.g. 57% of Sixth class pupils in Gaeltacht schools had parents who regularly watched TV programmes in Irish while just 21% of SLG pupils were in this category. Regularly reading books in English was the only activity undertaken by a higher percentage of SLG parents (88% of pupils) than Gaeltacht parents (74% of pupils).

Figure 4.4: Percentages of Sixth class pupils who have at least one parent or guardian who regularly engages in a range of language activities, SLG and Gaeltacht schools



Frequency of reading Irish language newspapers

Parents of Second class pupils were asked about the frequency with which they read Irish language newspapers. Just 5% of Second class pupils in SLG and 14% in Gaeltacht schools lived in homes where at least one parent reported reading Irish language newspapers regularly.

Table 4.7: Percentage of pupils with parents who attended an Irish-medium primary or post-primary school, by school type and grade level

		Primary		Post-primary	
		2nd	6th	2nd	6th
SLG	Neither parent	88	87	92	90
	One parent	11	12	7	9
	Both parents	1	1	1	1
Gaeltacht	Neither parent	31	24	63	57
	One parent	45	43	24	24
	Both parents	24	33	13	19

Large differences were found between the school types in the percentages of pupils with at least one parent who had attended an Irish-medium school.[21] Roughly one-in-eight SLG pupils had at least one parent who attended an Irish-medium primary school while up to three-quarters of Gaeltacht pupils had (Table 4.7). While 88% of Second class SLG pupils were from homes where neither parent had attended an Irish-medium primary school, just 31% of Second class pupils in Gaeltacht schools were in this category. The difference was even greater at Sixth class: 87% of Sixth class SLG pupils were in homes where neither parent had attended an Irish-medium primary school compared to 24% of pupils in Gaeltacht schools. It was much more common for pupils in Gaeltacht schools to live in homes where both parents had attended an

[21] Pupils who are missing data for one parent but who have data available for the other parent are included in 'neither parent" if the parent for whom data were supplied did not attend an Irish-medium school and in the 'one parent' category if the parent for whom data were available attended an Irish-medium school.

Irish-medium primary school: between one-quarter and one-third of pupils in the Gaeltacht were in this category compared to just 1% of SLG pupils.

It was less common for parents to report that they had attended an Irish-medium post-primary school. At least 90% of SLG pupils lived in homes where neither parent had attended an Irish-medium post-primary school. The corresponding figures among pupils in Gaeltacht schools were 63% at Second class and 57% at Sixth class (Table 4.7).

Pupil attitudes towards and use of Irish

Pupils were presented with a series of statements about attitudes towards, and use of, the Irish language. At Second class, pupils were asked to give yes/no responses while at Sixth class, pupils rated their level of agreement with each statement on a 5-point scale ranging from *strongly agree* to *strongly disagree*. This section examines pupils' responses to individual statements and also pupil scores on an overall scale measuring attitudes to the Irish language.

It was noted above (Table 4.2) that just 2-4% of SLG pupils reported that Irish was the language they spoke most often at home. However, when presented with the statement 'I use a lot of Irish at home'[22], 14% of Sixth class SLG pupils and 23% of Second class SLG pupils agreed.[23] Similarly in Gaeltacht schools, while 20-24% of pupils indicated that Irish was the main language of their homes, 36-44% considered that they speak a lot of Irish at home. Second class pupils were presented with an additional statement about the use of Irish at home. About half of pupils in both SLG and Gaeltacht schools agreed that 'My parents speak Irish to me at home' (e-App. Table E4.33).

Table 4.8: Percentages of pupils at Second and Sixth class indicating that they like to speak Irish at school and at home, by school type and grade level

	I like to speak Irish…			I like to speak English…
	At school	At home	With my friends[1]	To my friends in the school yard
SLG				
2nd Class (Yes)	80	40	68	47
6th Class (Agree / strongly agree)	55	21	21	48
Gaeltacht				
2nd Class (Yes)	76	51	44	74
6th Class (Agree / strongly agree)	58	48	29	63

[1]At Second class, statement was 'I like to speak Irish to my friends in the school yard'; at Sixth, 'I like to speak Irish with my friends'.

Pupils displayed broadly positive attitudes towards speaking Irish at school. At Second class, about 80% of pupils in both SLG and Gaeltacht schools indicated that they like to speak Irish at school (Table 4.8). The corresponding figure was somewhat lower at Sixth class where 55% of pupils in SLG and 58% in Gaeltacht schools agreed or strongly agreed that they like to speak Irish at school.

[22] The statement for Second class pupils was 'I speak a lot of Irish at home'.
[23] 'Agreed' or 'strongly agreed' at Sixth class or responded 'yes' at Second class.

Pupils, particularly those in SLG, were less positive about speaking Irish at home. Just 40% of Second class and 21% of Sixth class pupils in SLG agreed that they like to speak Irish at home (Table 4.8). The corresponding percentages for Gaeltacht schools were 51% and 48% respectively.

Second class pupils were presented with two statements regarding their language of choice for communicating with friends in the school yard. A majority of Second class SLG pupils (68%) indicated that they like to speak Irish to their friends in the school yard (Table 4.8). When asked about whether or not they liked speaking English in this context, 47% of Second class SLG pupils agreed. This contrasts with the situation in Gaeltacht schools where 44% of Second class pupils said that they like to speak Irish with their friends in the school yard and 74% reported that they like to speak English.

Sixth class pupils displayed less positive attitudes towards using Irish for communicating with friends. When asked to indicate their level of agreement with the statement *'I like to speak Irish with my friends'*, just 21% of SLG pupils and 29% in Gaeltacht schools agreed or strongly agreed (Table 4.8). When asked about their attitude towards speaking English to their friends in the school yard, 48% of Sixth class SLG pupils and 63% in Gaeltacht schools agreed or strongly agreed that they like to; about one-fifth of pupils were 'not sure' about speaking English to their friends.

Sixth class pupils were asked to indicate their level of agreement with the view that it is easier to read in English than in Irish. Over half of pupils in the Gaeltacht agreed or strongly agreed compared to one-third in SLG (e-App. Table E4.34). However, while pupils may be divided on whether it is easier to read in English, a large majority indicated that they prefer to read in English than in Irish. Over 80% of Sixth class SLG pupils and 70% in Gaeltacht schools agreed or strongly agreed that they prefer to read in English than in Irish. High percentages of Second class pupils also reported that they prefer to read in English than in Irish: 86% of pupils in SLG and 80% in Gaeltacht schools indicated that English was their preferred language for reading.

Second class pupils were asked about their attitudes towards reading Irish books and watching Irish language programmes on TV. A minority of pupils indicated that they like to watch Irish language TV programmes (39% in SLG and 37% in Gaeltacht schools). Pupils showed greater interest in reading Irish books: 59% of SLG pupils and 54% in Gaeltacht schools indicated that they like to do this activity (e-App. Table E4.34).

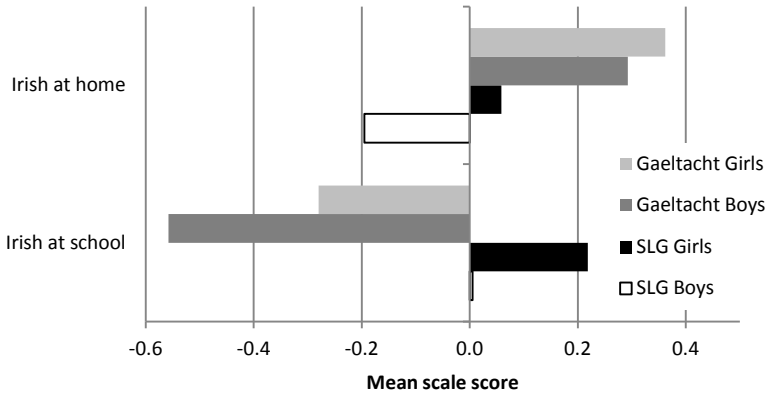
An overall measure of pupil attitudes towards Irish was constructed from the individual statements discussed above. At Second class, two factors emerged: one representing attitudes towards the use of Irish at school and one measuring engagement with Irish at home (e-App. E4.35). At Sixth class, a single factor emerged which measured pupil engagement with the Irish language (e-App. Table E4.36).

On the scale measuring attitudes towards the use of Irish at school, Second class SLG pupils had a significantly higher mean score than pupils in Gaeltacht schools. Conversely, on the scale measuring engagement with Irish at home, SLG pupils had a significantly lower score. Some gender differences are apparent (Figure 4.5). In SLG, boys had a significantly lower score than girls on both scales, i.e. attitudes towards the use of Irish at school and at home. In Gaeltacht schools, only the gender difference in attitudes towards the use of Irish at school was statistically significant.

At Sixth class, there is a single overall measure of engagement with Irish which incorporates use and enjoyment of the language. Pupils in Gaeltacht schools had a

significantly higher mean score on this scale; the difference between pupils in Gaeltacht schools and SLG amounts to two-fifths of a standard deviation. A significant gender difference in favour of girls was evident in SLG but not in Gaeltacht schools.

Figure 4.5: Gender differences at Second class in engagement with Irish at home and school



Pupil attitudes and parental knowledge of Irish

Not surprisingly, pupils from homes where at least one parent spoke Irish had significantly higher mean scores on the scale measuring engagement with Irish at home. However, having a parent who spoke Irish was not significantly associated with pupil attitudes towards using Irish at school.

Current and Future Schooling

This section outlines parents' reasons for selecting an Irish-medium primary school for their children. Pupils' engagement in school is then discussed along with parents' and pupils' expectations and aspirations for future schooling.

Reasons for selecting Irish-medium primary school

Parents were asked why they had selected an Irish-medium primary school for their child and were provided with a space in which to write their answers. This section focuses on the responses of parents of Sixth class pupils in SLG because firstly, the majority of parents of pupils attending Gaeltacht schools indicated that the reason for their choice was the proximity of the school, and secondly, the responses of parents of Second class SLG pupils are broadly similar to those of parents of Sixth class pupils.

This section is intended to provide an overview of parents' reasons for choosing SLG. Data are not weighted since the number of reasons varied across respondents (ranging from zero to four); therefore, precise estimates of population figures are not possible. Parents' responses were given a code from a list of 47 categories devised after screening the questionnaires. The 47 categories were later grouped into nine broader groups covering related themes.

Over 90% of Sixth class SLG pupils who completed the reading and/or mathematics test and who had parent questionnaire data available had at least one reason given by their parents for why an Irish-medium school was chosen: the parents of 65% of pupils provided one reason, 21% provided two, 4% provided three and fewer than 1% provided four reasons for choosing a SLG.

The most widely reported reason for selecting an Irish-medium school related to the place of the Irish language in the linguistic heritage of Ireland and the importance of maintaining the language. The parents of about 28% of pupils with valid data on this question provided reasons from this category (Table 4.9), e.g. "We should all speak Gaeilge" and "To preserve Gaeilge". Parents of about one-quarter of pupils with valid data cited reasons relating to the cognitive benefits of bilingualism and the

greater ease with which younger children are purported to acquire second languages, e.g. "To learn other languages more easily", "So child could grow up with better understanding of English and Irish – bilingual".

Table 4.9: Reasons of parents of Sixth class pupils in SLG for selecting an Irish-medium school (percentage of valid responses)

Description of category	N responses	% of parents[1]
Irish as part of our cultural and linguistic heritage	362	28
Cognitive benefits of bilingualism and greater ease of early language learning	288	23
Irish is the language of the family	228	18
School reputation, facilities and personal recommendations	216	17
School ethos, environment and atmosphere	215	17
Practical considerations (e.g. school proximity)	127	10
Extrinsic motivation including future educational and employment opportunities	99	8
Prior difficulty with Irish in alternative educational setting	88	7
Other	93	7

[1]Percentages do not sum to 100 as some parents gave up to four reasons. Percentages are unweighted and are based on pupils with valid data on this question.

The parents of 18% of pupils (with valid data on this question) indicated that they had selected an Irish-medium school because Irish is the language which they spoke themselves, the language spoken by the child's grandparent, or the language which the child used at home. Similar percentages of parents reported that they selected the school based on its reputation (17%) or because of the school ethos (17%). Comments such as "Gaelscoils are perceived as a higher standard of school", "committed cohort of parents" and "good reputation of school" represent those included in the 'reputation' category. "Less associated with Catholicism" and "co-educational" are examples of some reasons classified as 'School ethos, environment and atmosphere'.

About one in ten parents who provided at least one reason cited practical considerations such as the distance from their home to the school, having other children in the school already or the SLG being the only school with a place available when they wished to enrol their child. Fewer parents (8%) chose an Irish-medium school so that their child would have greater educational and employment opportunities in the future. A similar percentage reported selecting an SLG because either they or their child had previously had difficulty learning Irish in a non-immersion setting.

Engagement in school and future educational expectations

In both SLG and Gaeltacht schools, about half of Second class pupils reported that they like school, about 30% were unsure, and the remainder indicated that they did not like school (e-App. Table E4.40). In SLG, pupils who reported that they liked school achieved a significantly higher mean reading score than those who disliked school.

Parents of Second class pupils were asked whether or not they expected their child to remain in their current primary school until the end of Sixth class and also whether or not they expected their child to attend an all-Irish post-primary school. Over 95% of parents of Second class pupils in both SLG and Gaeltacht schools indicated that their child would remain in their current school until the end of Sixth class, about 3% were unsure and approximately 1% expected their child to change schools prior to the end of their primary education (e-App. Table E4.41). About two-

thirds of Second class pupils were expected (by their parents) to continue to an all-Irish post-primary school (e-App. Table E4.42).

Sixth class pupils were asked about their educational aspirations and expectations. A large majority of pupils (80% in SLG and 73% in Gaeltacht schools) reported that they would like to go to university or college (e-App. Table E4.43). This was also found in NA '09 where 76% of Sixth class pupils indicated that they would like to go to university or college. Somewhat lower percentages of pupils actually expected to do this: 73% of SLG pupils and 65% of Gaeltacht pupils expected to get a Third Level education. The corresponding figure in the NA '09 was 69%.

In contrast, a tiny minority of Sixth pupils (less than 4% in all school types) would like to leave school either after primary school or after the Junior Certificate examination. Even fewer actually expected to leave school at this stage (about 1% in SLG, less than 1% in Gaeltacht schools and 2% in NA '09).

There is some evidence of an association between pupil expectations and family socioeconomic status. In Gaeltacht schools, 60% of Sixth class pupils from low SES families expected to go to college or university compared to 78% of pupils from high SES families (e-App. Table E4.44). Similarly, in SLG, 70% of Sixth class pupils from low SES families expected to go to college or university compared with 80% of pupils from high SES families. Findings from NA '09 are broadly similar: 62% of Sixth class pupils from the lowest SES group indicated that they expected to go to college or university compared with 82% of those from the highest category (e-App. Table E4.45). Pupils from low SES families were somewhat more likely to report that they expected to leave school after their Leaving Certificate (13% in SLG, 25% in Gaeltacht schools, 20% in NA '09) than their counterparts from high SES families (6% of high SES pupils in SLG, 11% in Gaeltacht schools, and 7% in NA '09 stated that they expected to leave school after their Leaving Certificate).

Sixth class pupils and their parents were asked about plans for the child's post-primary education, i.e. whether or not the pupil was expected to attend an all-Irish post-primary school and reasons why this may or may not have been the case. About half of pupils reported that they expected to attend an all-Irish post-primary school (45% of SLG pupils and 52% of Gaeltacht pupils; Table 4.10). A higher percentage of parents of Gaeltacht pupils (61%) than parents of SLG pupils (46%) reported that their child would attend an all-Irish post-primary school.

Table 4.10: Pupil and parent expectations of child attending an Irish-medium post-primary school: Sixth class pupils in SLG and Gaeltacht schools[1]

	Pupil (%)	Parent (%)
SLG	45	46
Gaeltacht	52	61

[1]Not asked in NA '09

About a quarter of all Sixth class SLG pupils indicated that they would not attend an Irish post-primary school because there is none near their home (e-App Table E4.46). Similarly, one quarter of Sixth class Gaeltacht pupils indicated that they would not attend as there is none near their home. About a quarter of SLG pupils and one-third of Gaeltacht pupils indicated that neither they themselves nor any of their friends would attend an all-Irish post-primary school (e-App. Table E4.47).

Pupils in Sixth class were also asked whether or not they would like to attend an all-Irish post-primary school so it is interesting to examine the extent to which pupils' wishes match their expectations. In SLG, 40% of pupils stated that they would

like to, and would attend, an all-Irish post-primary school while just 5% will attend but would not like to (e-App. Table E4.48). Conversely, 13% indicated that they will not attend an all-Irish post-primary school but that they would like to. The remainder (43%) expect to, and want to, attend a post-primary school which is not all-Irish. Percentages are similar in Gaeltacht schools although only 7% of pupils would not attend an all-Irish post-primary school even though they would like to.

Key Points

- The average socioeconomic status of pupils in Scoileanna Lán-Ghaeilge (SLG) was significantly higher than that of pupils in Gaeltacht schools and in primary schools generally.
- Only 7% of Second class pupils and 6% of Sixth class pupils in SLG were born outside Ireland compared with 11-13% of pupils in Gaeltacht schools and 14-15% of pupils nationally.
- One-fifth of Second class pupils and one-quarter of Sixth class pupils in Gaeltacht schools indicated that Irish is the main language spoken in their homes. Irish was the main home language of just 4% of Second class pupils and 2% of Sixth class pupils in SLG. Higher percentages of pupils indicated that they speak a lot of Irish at home, although it is not the main language spoken.
- A sizeable minority of pupils in SLG (Second class: 21%; Sixth class: 39%) lived in homes where neither parent could speak Irish and most (Second: 88%; Sixth: 87%) lived in homes where neither parent had attended an Irish-medium primary school. It was less common for pupils in Gaeltacht schools to live in homes where neither parent could speak Irish (Second class: 13%; Sixth class: 17%). It was also less common for pupils in Gaeltacht schools (Second 31%; Sixth: 24%) to live in homes where neither parent had attended an Irish-medium primary school.
- Parents reported having comparatively fewer Irish language books at home than English language books. Up to two-thirds of pupils had 10 or fewer Irish books at home while only one-in-ten Gaeltacht pupils and one-in-twenty SLG pupils had 10 or fewer English books. A positive association was found between the number of books at home and pupil reading achievement.
- As in NA '09, pupils who reported having a TV in their bedroom achieved significantly lower reading and mathematics scores on average than pupils with no TV in their bedroom. Pupils from a lower socioeconomic background were more likely to have a TV in their bedroom.
- Pupils displayed broadly positive attitudes towards speaking Irish at school. A majority of pupils at both grade levels in both SLG and Gaeltacht schools agreed that they like to speak Irish at school. However, lower percentages of pupils agreed that they like to speak Irish at home or with friends. A large majority of pupils reported that they prefer to read in English than in Irish.
- The most common reason given by parents of Sixth class pupils for selecting a SLG for their child related to the importance of the Irish language for Irish identity: the parents of 28% of pupils with valid data indicated that they had selected an SLG for this reason. About 23% of parents elected to send their child to an SLG because of the perceived cognitive benefits of bilingualism and early language learning. School reputation and ethos were commonly reported.
- About half of Sixth class pupils in SLG and Gaeltacht schools expected to attend an all-Irish post-primary school.

Chapter 5
A Profile of Schools and Classrooms

This chapter describes some characteristics of the learning environments in schools attended by pupils participating in NAIMS. There are nine main sections. First, key features of schools – such as location and enrolment size – and characteristics of teachers and classrooms are outlined. In the second section, teacher participation in professional development activities is described. Section three explores teacher confidence in various aspects of teaching English and mathematics. Section four examines the provision of learning support and language support. Section five outlines the resources – technology and books – available in schools and classrooms. The use of standardised assessments is examined in section six. School policy on the beginning of reading instruction is discussed in section seven. Section eight summarises principals' reports of the challenges in teaching English and mathematics in Irish-medium schools. The concluding section summarises some of the key points arising in this chapter.

The focus of this chapter is on describing characteristics, practices and facilities in schools and classrooms; detailed analyses of associations between these characteristics and achievement are examined in Chapter 7. In general, Sixth class pupils are used as the reference group in this chapter although in some parts, data on Second class are provided, i.e., if Second class is more directly relevant to the topic under discussion (e.g. beginning of formal reading instruction), if findings at Second class differ substantively from those at Sixth class, or where space allows. When passing reference is made to Second class pupils in the text, further detail is provided in the associated e-Appendix.

NAIMS does not allow us to make causal inferences; e.g., although there is an association between pupil socioeconomic status (SES) and achievement, we cannot say that higher SES *causes* higher achievement. Similarly, while this chapter explores some aspects of school policy such as the language in which formal reading instruction begins, it is not possible to say that any observed differences in pupil achievement are *caused* by differences in school policy.

As in NA '09, this chapter reports data from the teacher and school questionnaires at the *pupil* level; i.e. rather than saying that "Only 15% of Sixth class teachers did X", we say that "Only 15% of Sixth class pupils were in classrooms where teachers did X". The focus of the chapter is on what pupils experienced, rather than on how many teachers engaged in particular practices.

Characteristics of the Learning Environment

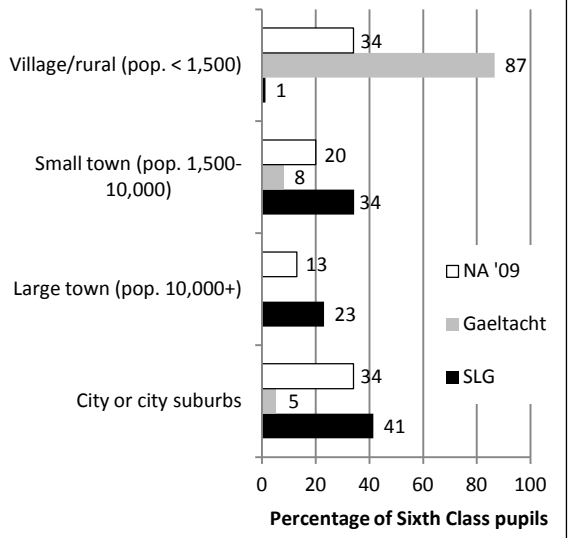
School Characteristics

Figure 5.1 (overleaf) compares the locations of Gaeltacht schools and Scoileanna Lán-Ghaeilge (SLG). While a large majority of Sixth class pupils in participating Gaeltacht schools (87%) were enrolled in schools located in villages or rural areas, the corresponding figure for Sixth class SLG pupils was just 1%. Conversely, 41% of

participating Sixth class SLG pupils were enrolled in city or suburban schools, compared to 5% of Sixth class Gaeltacht pupils.

On average, SLG tended to have higher numbers of pupils enrolled than Gaeltacht schools but similar numbers of pupils to schools generally (i.e. those surveyed in NA '09). The average school enrolment in schools attended by Sixth class pupils was 267 for SLG compared to 97 for Gaeltacht schools (Table 5.1). The corresponding figure for schools attended by Sixth class pupils in NA '09 was 271. The median[24] values in both SLG and Gaeltacht schools were lower than the corresponding means, at 240 and 85 respectively. The smaller enrolment size of Gaeltacht schools is further discussed later in the context of SES.

Figure 5.1: Location of schools attended by Sixth class pupils, by school type



School type and participation in DEIS

Most Sixth class SLG pupils (92%) were in schools not participating in the School Support Programme (SSP) under DEIS. The remainder (8%) were split between Urban Band 1 and Urban Band 2 schools, with about three times as many in Band 2 as Band 1.

A large minority of Sixth class pupils in Gaeltacht schools (44%) were enrolled in schools participating in the rural dimension of the SSP. No Gaeltacht pupils attended schools classified under DEIS as Band 1 or Band 2 Urban.

In NA '09, 9% of Sixth class pupils were enrolled in DEIS Band 1 schools, 9% in DEIS Band 2 schools, and 4% in Rural SSP schools.

Table 5.1: Summary characteristics of schools attended by Sixth class pupils, by school type

	SLG			Gaeltacht			NA '09	
	Mean	Median	90% range	Mean	Median	90% range	Mean	90% range
Enrolment (pupils)	267	240	176 to 405	97	85	31 to 180	271	52 to 609
Attendance rate (%)	94	95	91 to 95	94	94	91 to 97	92	87 to 96
Traveller community (%)	0.3	0	0 to 0	<0.1	0	0 to 0	2%	0 to 7

Principals reported high attendance rates in both SLG and Gaeltacht schools. The average attendance rate in schools attended by Sixth class pupils was 94% in both school types (Table 5.1). This is very similar to the average rate reported by principals in NA '09 (92%).

Pupils from the Traveller community accounted for fewer than 1% of Sixth class pupils in Irish-medium schools, with little difference by school type (Table 5.1). In NA '09, principals indicated that on average, about 2% of pupils came from the Traveller community.

[24] The median is the "middle" value in a list of sorted numbers. It is less sensitive to extremely small and extremely large values than the mean.

While the characteristics of pupils' families were examined in Chapter 4, it is important to also consider the overall social context of the school, as both the pupil's own background and the overall school context have been shown to be associated with pupil achievement (see e.g., Sofroniou, Archer & Weir, 2004). For the current analyses, data on parental occupation from the parent questionnaires of Second and Sixth class pupils were combined to give an overall measure of school SES.

It should be noted that about one-quarter of Sixth class pupils in Gaeltacht schools attended schools where the school enrolment composition measures are based on data from ten or fewer pupils; i.e. in total in the school, ten or fewer pupils participated in the assessment at Second and Sixth class. An inherent problem associated with using data aggregated to the school level is that when pupil numbers are very small, small numbers of atypical pupils can skew the results for that school. Furthermore, estimates in small schools are also more likely to fluctuate from one year to another. Detailed analyses of the association between achievement and school-aggregate measures of socioeconomic composition are described in Chapter 7.

Figure 5.2: School-average SES of schools attended by Sixth class pupils

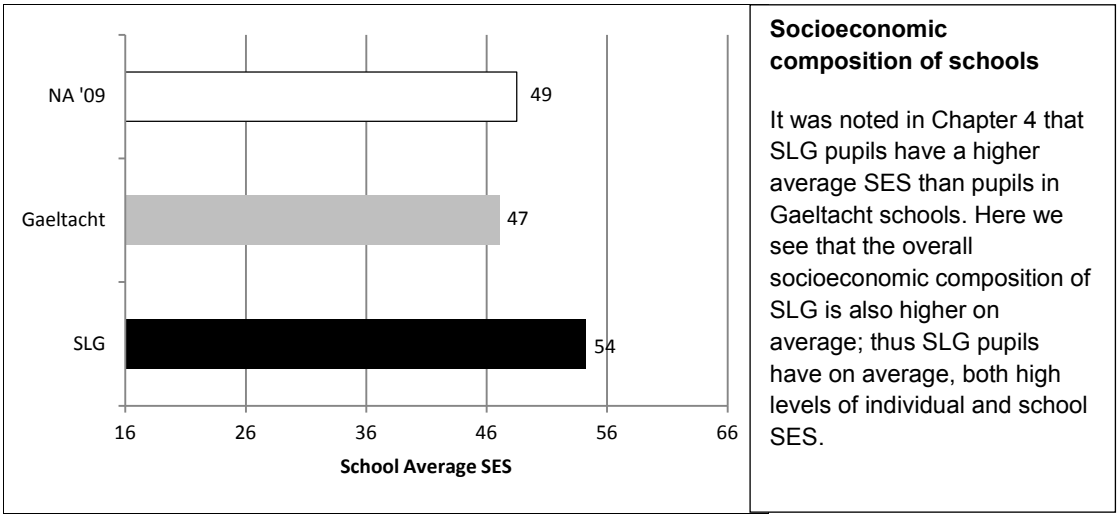


Figure 5.2 compares the average SES of schools attended by Sixth class pupils in NA '09 with that of schools attended by Sixth class pupils in NAIMS. The average school-level SES of SLG pupils is four-fifths of a standard deviation[25] higher than the average SES of the schools attended by pupils in NA '09 (i.e., 5.8/7.08) and one standard deviation higher than the average SES of Gaeltacht schools (i.e., 7.2/7.08); both of these differences are statistically significant. Although the average SES of Gaeltacht schools is lower than the corresponding figure in NA '09, the difference is not statistically significant. Comparing the school-average SES of Second class pupils (based on home background information of Second class pupils only) with the school average SES of Sixth class pupils (based on home background information of Sixth class pupils only) reveals no significant difference between the two grade levels in either SLG or Gaeltacht schools (e-App. Table E5.1).

[25] The standard deviation in school average SES across Sixth class pupils in NA '09 was 7.08. The standard deviation in school average SES across Sixth class pupils in SLG was 5.65 and in Gaeltacht schools 6.43. The mean school average SES in SLG was 54.3, 47.1 in Gaeltacht schools and 48.5 in NA '09.

School participation in the School Support Programme (SSP) under DEIS is another indicator of the socioeconomic composition of a school's intake. As noted earlier, a large majority of SLG pupils (92% at Sixth class) attended schools which were not participating in the SSP, while a little under half of pupils in Gaeltacht schools (44% at Sixth class) attended schools which were participating in the rural dimension of the SSP (see 'School type and participation in DEIS', Figure 5.1). The mean reading achievement of Second class pupils in SSP schools was significantly lower, by one-third (Gaeltacht) to half (SLG) a standard deviation (summarised in Table 5.2; also see e-App. Table A5.2 – reading). At Sixth class, the difference was statistically significant only in SLG and the magnitude of the difference was about the same as at Second class in SLG.

Table 5.2: Summary of statistically significant differences in average pupil achievement between SSP and non-SSP schools, by domain, grade level and school type

	SLG	Gaeltacht
Reading – Second	↓	↓
Reading – Sixth	↓	–
Maths – Second	↓	–
Maths – Sixth	↓	–

↓ Indicates that difference between pupils in SSP and non-SSP schools is statistically significant ($p < .05$)

Looking at achievement in mathematics, there were statistically significant differences by school SSP status for SLG pupils but not for Gaeltacht pupils (Table 5.2). At Second class, the difference in favour of non-SSP SLG pupils was 37 points and at Sixth class, 29 points (details by DEIS band are provided in e-App. Table A5.4).

It is also interesting to look at how the average performance of pupils in DEIS Band 2 SLG compared with the average performance of pupils in DEIS Band 2 schools in NA '09 and to compare the performance of pupils in Gaeltacht Rural DEIS schools with that of pupils in Rural DEIS schools in NA '09. At both Second and Sixth class, there were no significant differences in the mean reading scores of pupils in DEIS Band 2 SLG and those in DEIS Band 2 in NA '09. Similarly, there were no significant differences in the mean reading scores of pupils in Gaeltacht Rural DEIS schools and those in Rural DEIS schools in NA '09 (e-App., Tables E5.3, E5.3). Similar results were found for mathematics (e-App. Tables E5.4, E5.5).

Teacher and Classroom Characteristics

A majority of pupils at both grade levels were taught by female teachers (Sixth class: 75% in SLG and 62% in Gaeltacht schools; Second class: 79% and 94% respectively) and by teachers in permanent posts (Sixth class: 95% in SLG and 91% in Gaeltacht schools; Second class: 84% and 91%, respectively) (e-App. Table E5.6). Similarly in NA '09, a majority of pupils were taught by female teachers (Sixth class: 69%; Second class: 91%) and by teachers in permanent posts (Sixth class: 94%; Second class: 84%). All teachers surveyed in NAIMS and in NA '09 indicated that they were qualified teachers. One-third to half of pupils (Sixth class: 34% in SLG, 54% in Gaeltacht schools, 42% in NA '09; Second class: 43% in SLG, 47% in Gaeltacht schools and 35% in NA '09) were taught by teachers who reported having additional qualifications relevant to teaching, such as a Masters in Education (M. Ed) (e-App. Table E5.6).

Sixth class SLG pupils were taught by teachers with an average of 13 years teaching experience compared to an average of 20 years among teachers of Sixth class pupils in Gaeltacht schools; this difference is statistically significant (e-App. Table E5.7). Similarly, at Second class, pupils in Gaeltacht schools were taught by teachers with significantly more experience on average than teachers in SLG (18 years versus 8

years). Sixth class teachers in NA '09 had, on average, just over 16 years teaching experience; the corresponding average at Second class was 11 years (e-App. Table E5.6).

About one-fifth of Sixth class pupils in Gaeltacht schools were taught by teachers who had specific responsibility for Irish; similar percentages of pupils were taught by teachers who had specific responsibility for English or mathematics (e-App. Table E5.6). Fewer Sixth class SLG pupils were taught by teachers who had specific responsibility for English (8%), mathematics (6%) or Irish (14%); however, differences between SLG and Gaeltacht schools were not statistically significant. In NA '09, 9% of Sixth class pupils were taught by teachers with specific responsibility for mathematics and 7% were taught by teachers with a specific responsibility for English.

Class size (i.e. the total number of pupils to whom the teacher taught English, including those in the target grade) varied considerably across schools, ranging between 13 and 39 at Sixth class level in SLG and between 6 and 33 at Sixth class in Gaeltacht schools. Not surprisingly, it was much more common for pupils in Gaeltacht schools to be in multigrade classes: 65% of Gaeltacht Sixth class pupils were in multigrade classes compared to 14% of SLG pupils (Table 5.3). In NA '09, about one-third of Sixth class pupils were taught in multigrade classrooms.

Table 5.3: Percentages of Sixth class pupils in multigrade and single grade classrooms, by school type and mean class size

	SLG		Gaeltacht		NA '09	
	%	Mean	%	Mean	%	Mean
Multigrade	14	26.6	65	18.8	32	23.4
Single grade	86	26.0	35	22.1	68	25.9

A break-down of the average class size of Sixth class pupils by single grade/multigrade shows that average class sizes in Gaeltacht schools were somewhat smaller than the corresponding averages in SLG and NA '09. In Gaeltacht schools, there was an average of 19 pupils in multigrade classes and 22 pupils in single grade classes (Table 5.3). At 26 pupils, the average class size of Sixth class SLG pupils in single grade classes was the same as the corresponding figure in NA '09 (Table 5.3), but a higher percentage of SLG pupils (86%) were in single grade classes compared to NA '09 pupils (68%). The average class size across SLG Sixth class pupils in multigrade classes (mean=27) was somewhat larger than the corresponding figure in NA '09 (mean=23, Table 5.3) but just 14% of Sixth class SLG pupils were in multigrade classrooms.

Continuing Professional Development

Teachers were asked to indicate the number of days they had spent undertaking courses relevant to the teaching of English, mathematics or Irish in the three years prior to NAIMS. They were also asked about the number of days on which they received assistance from a cuiditheoir/Primary Professional Development Service[26] (PPDS) advisor. These were combined for analysis to give an overall indicator of the quantity of professional development undertaken (similar to analysis undertaken in NA '09).

In order to make comparisons with NA '09, it is useful to examine the percentages of pupils in classes where the teacher had not done any professional

[26] From September 1st 2010, the Primary Professional Development Service has been incorporated into the Professional Development Service for Teachers (PDST).

development in English or mathematics. Findings indicate that the percentages of Sixth class pupils in Irish-medium schools taught by teachers who had not undertaken any professional development relevant to either English or mathematics (38% in SLG and 28% in Gaeltacht schools) in the three years prior to the study were similar to those found in the NA '09 (28%) (e-App. Table E5.9). The percentages were higher at Second class than at Sixth but were broadly similar in Irish-medium schools and in NA '09 (SLG: 52%; Gaeltacht: 41%; NA '09: 35%) (e-App. Table E5.10).

Once professional development in Irish is considered, there is a drop in the percentages of pupils in Irish-medium schools whose teacher had engaged in none of the listed areas of professional development in the previous three years. This is particularly evident in Gaeltacht schools: just 19% of Second class pupils and 16% of Sixth class pupils were in Gaeltacht schools where teachers had engaged in no professional development in English, mathematics or Irish in the previous three years (e-App. Tables E5.9, E5.10). It is likely that this relates to the additional support provided to Gaeltacht schools in 2009/2010 on the use of Séideán Sí.[27] About three-quarters of Second class and Sixth class pupils in Gaeltacht schools were in classes where the teacher had either attended a course or received assistance from a PPDS advisor relevant to the teaching of Irish (e-App. Tables E5.9, E5.10).

Overall, the average number of days of professional development (for English, Irish and mathematics combined) was significantly higher in Gaeltacht schools (Sixth class teachers: 5.8; Second class: 6.4) than in SLG (Sixth class teachers: 3.2; Second class: 3.7) (e-App. Tables E5.11). However, one reason for this may relate to the additional support given to Gaeltacht schools by the PPDS as the average number of days of professional development in English and mathematics combined (excluding Irish) at Sixth class was not significantly different in Gaeltacht schools (3.5) and in SLG (2.3)[28] (e-App. Table E5.12).

In an open-ended question, teachers were asked to indicate their personal priority areas for continuing professional development in English, mathematics and Irish. For English, the area of writing skills was most frequently identified as an area of professional development need in NA '09. This also emerged as a key priority of teachers in Irish-medium schools where developing pupils' skills in creative writing was identified by teachers of between one-quarter (SLG) and two-fifths (Gaeltacht) of Sixth class pupils (Table 5.4).[29] The area of writing skills was also the top ranked priority by teachers of Second class pupils, about one third of whom were in classes where teachers identified this as a priority (see e-App. Table E5.13). In general, the priorities identified by teachers in SLG and Gaeltacht schools were similar.

For mathematics, the two most commonly identified areas of professional development need by Sixth class teachers (use of ICT/interactive whiteboards and developing problem-solving skills, Table 5.5) were also the most commonly identified areas in NA '09. Other frequently cited topics by Sixth class teachers in Irish-medium

[27] Tús Maith was established in 2006 to support teachers in developing their own confidence and competence in the use of Irish, and also to improve the teaching and learning of Irish. The Tús Maith team was merged with the PCSP Gaeilge team in order to provide cohesive support to schools and teachers. In the school year 2009/2010, Gaeltacht primary schools were invited to apply for customised support in the use of Séideán Sí (*http://ppds.ie/images/stories/tusmaith/tusmaithoutline.pdf*, last verified 10.05.2011).

[28] However, at Second class the difference in favour of teachers in Gaeltacht schools was statistically significant; a 95% confidence interval for the difference between SLG and Gaeltacht schools ranges from -3.3 to -0.04.

[29] Standard errors for percentages are provided in the e-appendix. As standard errors are comparatively large, differences between the percentages in SLG and Gaeltacht schools are generally not statistically significant.

Table 5.4: Percentages of Sixth class pupils taught by teachers who identified various topics as among their top three priority topics for English CPD

Topic	Examples of teacher responses	SLG	Gael
Creative writing	"Extra help with working through the creative writing process"	26	42
Oral language	"Confidence in oral English"	19	34
ICT (including interactive whiteboard)	"Using the computer/internet to teach English"	20	25
Strategies/materials for teaching lower achieving pupils	"Teaching reading to children with learning difficulties"; "identification of reading difficulties"	12	19
Text or resource selection	"Useful literacy websites, advice on choosing novels for senior classes, finding interesting material"	18	17
Spelling, phonics	"Phonological awareness/spellings"	12	16
Developing writing skills (other than creative)	"Developing techniques for teaching English writing"; "Editing/drafting: improving quality of students' work"	13	15
Poetry	"Guidance in composing poetry"	8	14
Other	"Team-teaching"; "handwriting"; "teaching English in a Gaelscoil setting"	21	10
Multigrade classes/ differentiation	"Teaching different abilities"	15	9
Assessment	"Assessment – diagnostic and standardised"; "curriculum profiles"; "use of reflective journals"	11	8
Grammar	"Developing a greater understanding of English grammar"	11	6
Teaching comprehension or higher order strategies	"Developing comprehension strategies"; "higher order thinking"	11	4

Table shows topics identified by teachers of at least 10% of pupils in one or both school types. Percentages are ranked in descending order of the percentages in Gaeltacht schools.

Table 5.5: Percentages of Sixth class pupils taught by teachers who identified various topics as among their top three priority topics for mathematics CPD

Topic	Sample teacher responses	SLG	Gael
ICT or Interactive whiteboard	"Internet", "computers", "interactive whiteboard"	32	44
Problem solving, developing higher level skills	"Written problems", "developing thinking skills"	21	31
Multigrade classes/differentiation	"Working with groups of varying ability", "multigrade classes", "Big classes"	19	22
Manipulatives, hands-on materials	"Concrete materials", "Games", "3-D shapes"	16	22
Special needs, identifying difficulties	"Teaching weaker pupils"	12	15
Assessment	"Reflective journals", "self-assessment", "profiles"	14	13
Higher-achieving pupils	"Extra challenges for pupils of high ability"	15	13
Specific topics e.g. fractions, decimals	"Fractions", "statistics", "algebra", "lines and angles", "area", "chance"	11	8
Linking maths to real life, other subjects	"Making greater links between maths and real life" "Making greater links between maths and other subjects", "Making maths useful for other subjects"	18	8
Other	"Teaching maths without the textbook" "Time to finish the curriculum" "How to change the pupils' attitudes"	16	8
Mental maths	"Mental maths"	12	5

Table shows topics identified by teachers of at least 10% of pupils in one or both school types. Percentages are ranked in descending order of the percentages in Gaeltacht schools.

schools were teaching in multigrade classes and implementing differentiation, and the use of manipulative or hands-on materials. Interestingly, for mathematics, support in working with higher-achieving pupils was considered to be a priority by the teachers of 13 to 15% of Sixth class pupils in Irish-medium schools (Table 5.5) whereas for English, working with higher achieving pupils was identified by the teachers of just 3 to 5% of pupils.

At Second class, areas accorded the highest priority were teaching specific topics (e.g. teaching time or money), using ICT and identifying websites, teaching different ability groups (e.g. in a multigrade class), and teaching pupils with special needs (e-App. Table E5.14). The top priorities for Second class teachers identified in NA '09 were very similar and included using ICT in teaching mathematics, teaching specific topics in mathematics, teaching word problems, and differentiation/multigrade classes.

Regarding professional development priorities for teaching Irish, some differences are evident between SLG teachers and those in Gaeltacht schools. Among teachers of Sixth class pupils in Gaeltacht schools, the top three priorities for professional development in Irish related to the use of ICT for teaching Irish, improving pupils' oral language and the availability and selection of suitable resources (Table 5.6). In SLG, teachers of Sixth class pupils most commonly identified the teaching of grammar as an area of professional development need. The availability and selection of resources was also widely cited by SLG teachers. However, although teachers commonly identified the availability and selection of resources as an issue for professional development, in some cases, the resources mentioned may not exist (e.g. more difficult textbooks for Sixth class pupils), so the professional development need may relate to the identification of suitable alternative materials.

Table 5.6: Percentages of Sixth class pupils taught by teachers who identified various topics as among their top three priority topics for Irish CPD

Topic	Examples of teacher responses	SLG	Gael
ICT or Interactive whiteboard	"New technologies"; "Interactive whiteboard"	17	33
Improving oral language, and increasing frequency of use	"Oral language: formal and informal conversation"; "to promote Irish as the language of communication of the pupils"	5	26
Resources - availability and selection	"Selecting resources from the internet"; "more difficult textbooks for Gaelscoileanna"; "better choice of novels"	25	24
Other	"Sample year plan"; "Books in the Ulster dialect"; "In-service on Séidean Sí"	17	22
Assessment	"Checklists"; "Standardised test in Irish"; "curriculum profiles"	10	17
Writing	"Essays"; "writing skills"; "more interesting ways to develop writing"	9	16
Grammar	"Additional strategies for teaching grammar"	35	8
Creative writing	"Creative writing"	12	4
Accuracy of language	"Cruinneas teanga"	10	3

Table shows topics identified by teachers of at least 10% of pupils in one or both school types. Percentages are ranked in descending order of the percentages in Gaeltacht schools.

Confidence in Teaching

Teachers were asked to indicate whether they were *very confident*, *somewhat confident* or *not confident* in teaching various specified aspects of the English and mathematics curricula and in working with various groups of pupils. Teachers were not asked about their

confidence in teaching aspects of Irish. The percentages of pupils taught by teachers who reported that they were *very confident* varied considerably across topics; however, the percentages in Irish-medium schools were very similar to those reported in the NA '09 (Tables 5.7, 5.8) (see e-App. Tables E5.16, E5.17 for Second class).

Table 5.7: Percentages of Sixth class pupils whose teachers indicated that they felt 'very confident' teaching specified aspects of English reading, by school type

	SLG	Gaeltacht	NA '09
Teaching high achievers in reading	61	55	58
Teaching low achievers in reading	35	47	40
Teaching reading skills in other subject areas (e.g. science)	39	43	48
Using computers to teach English	28	28	25

Table 5.8: Percentages of Sixth class pupils whose teachers indicated that they felt 'very confident' teaching specified aspects of mathematics, by school type

	SLG	Gaeltacht	NA '09
Teaching mathematical vocabulary	68	67	75
Teaching real-life problem solving	58	56	56
Working with lower-achieving pupils in mathematics	49	50	51
Integrating mathematics into other subjects	57	50	51
Extending higher-achieving pupils in mathematics	54	44	55
Using calculators to teach mathematics	52	44	39
Developing higher-level mathematics thinking skills	32	23	35
Using computers to teach mathematics	20	14	19

The area in which teachers of Second and Sixth class pupils were least likely to report that they were *very confident* was in the use of computers in teaching English and mathematics. Only about one-quarter of Sixth class pupils in Irish-medium schools and in NA '09 were in classes where the teacher indicated that he/she was *very confident* in using computers to teach English (Table 5.7). The percentages were even lower for mathematics (14-20%, Table 5.8). It is interesting to note that in Tables 5.4, 5.5 and 5.6 above, professional development in the use of ICT was considered a priority by teachers, particularly the use of ICT in teaching mathematics; it appears that this demand may be associated with teachers' lower levels of confidence in this area.

Provision of Additional Support

This section examines the provision of language support, learning support/resource teaching (LS/RT) for English and mathematics, LS/RT for Irish and the means by which support is provided.

Language Support

A majority of pupils (ranging from 53% of Second class SLG pupils to 60% of Sixth class pupils in Gaeltacht schools) attended schools where principals reported that no pupils had languages other than English or Irish as their mother tongue; i.e. all pupils in those schools spoke English or Irish at home (e-App. Table E5.18). Based on principals' reports, we find that on average, just 2% of all Sixth class pupils enrolled in Gaeltacht

schools and fewer than 1% in SLG had languages other than English or Irish as their mother tongue.[30]

Not surprisingly given the low numbers of newcomer pupils, language support for newcomer pupils was comparatively uncommon in Irish-medium schools. Principals reported that overall, newcomer pupils in receipt of English language support accounted for fewer than 1% of Gaeltacht and SLG Sixth class pupils. The percentages were similar for newcomer pupils in receipt of Irish language support.

The picture above can be contrasted with that found in NA '09 where there was a much higher percentage of pupils with languages other than English or Irish as their mother tongue. In NA '09, about 10% of schools' enrolment spoke languages other than English or Irish at home and about 6% of pupils were in receipt of English language support.

Learning Support/Resource Teaching for English and Mathematics

Principals in Irish-medium schools estimated that 5 to 6% of pupils[31] would score at or below the 12th percentile in English[32]; a similar percentage was expected to score at or below the 12th percentile in mathematics (Table 5.9). The corresponding percentages in NA '09 were 9% in English and 9% in mathematics. The percentages expected to score at or below the 12th percentile in Irish are discussed in the next section.

While school principals were asked to estimate the numbers of pupils across the whole school in receipt of learning support/resource teaching, class teachers were asked to indicate for each pupil in Second and Sixth class whether or not he/she was in receipt of LS/RT. The percentages of pupils in receipt of LS/RT based on teacher reports correspond quite closely to those computed on the basis of principals' reports. Teachers of Sixth class pupils indicated that 10% of Sixth class SLG pupils and 18% in Gaeltacht schools were in receipt of LS/RT for English (Table 5.10), whereas across the school as a whole, principals indicated that 14% of SLG pupils and 18% of Gaeltacht pupils were in receipt of LS/RT for English (Table 5.9).

Table 5.9: Mean school-level percentages of pupils in need/receipt of additional support, based on estimates provided by school principals

		SLG	Gaeltacht	NA '09
Estimated as at or below the 12th percentile:	English	5	6	9
	Maths	4	5	9
Total in receipt of LS/RT for:	English	14	18	15
	Maths	9	8	10

Table 5.10: Percentages of pupils in receipt of learning support/resource teaching for English or mathematics, based on teachers' reports on individual pupils

		SLG	Gaeltacht	NA '09
Second	English	16	20	16
	Maths	8	10	11
Sixth	English	10	18	11
	Maths	10	11	10

[30] Recall that in Chapter 4 it was noted that 1-2% of pupils indicated that they spoke languages other than Irish or English most frequently at home.

[31] Schools with no pupils in grades beyond Second class are excluded from this analysis.

[32] In choosing pupils for learning support/resource teaching, one criterion that may be applied is that the pupil scores at or below the 12th percentile on standardised tests of English or mathematics (DES, 2000).

Table 5.9 shows that, in each subject, higher percentages of pupils were reported to be in receipt of LS/RT than were estimated to be at or below the 12th percentile. Principals in Irish-medium schools indicated that 14-18% of the total enrolments were in receipt of LS/RT in English and 8-9% were in receipt of LS/RT for mathematics (Table 5.9). Thus, about three times as many pupils were in receipt of LS/RT for English as were estimated to be at or below the 12th percentile and up to twice as many pupils were in receipt of LS/RT for mathematics as were estimated to be at or below the 12th percentile. These percentages can be compared to those found in NA '09 where 15% of pupils were in receipt of LS/RT for English and 10% for mathematics. Therefore, although the issue of larger percentages of pupils getting support than are estimated to be at or below the 12th percentile is more pronounced in Irish-medium schools, this practice was also evident in the schools participating in NA '09. Also, the tendency in Irish-medium schools for higher percentages of pupils to get support in English than in mathematics is similar to that found in NA '09.

Table 5.11 shows the percentages of pupils in receipt of LS/RT in English or mathematics by participation in the SSP under DEIS. In general, the percentages of pupils in DEIS Band 2 schools in receipt of learning support in SLG are similar to those in Band 2 in NA '09. (Note that where differences arise, they are unlikely to be statistically significant given the magnitude of the standard errors associated with the percentages. In particular, comparatively few SLG are DEIS Band 2 schools so there is a higher degree of uncertainty attached to estimates for these schools). Similarly, the percentages of pupils in Gaeltacht Rural DEIS schools in receipt of LS/RT are very similar to the corresponding percentages of pupils in NA '09.

Table 5.11: Percentages of Sixth pupils in receipt of learning support/resource teaching for English or maths, based on teacher reports on individual pupils, by DEIS band

	Sixth class English			Sixth class maths		
	SLG	Gaeltacht	NA '09	SLG	Gaeltacht	NA '09
DEIS band 1	[a]	–	15	[a]	–	18
DEIS band 2	15	–	16	27	–	14
DEIS Rural	–	17	10	–	8	8
Not in SSP	9	19	10	9	13	10
	Second class English			Second class maths		
DEIS band 1	[a]	–	19	[a]	–	18
DEIS band 2	11	–	14	17	–	11
DEIS Rural	–	19	20	–	6	7
Not in SSP	16	21	16	8	12	11

[a]Data are not provided for this category as the percentage of pupils in SLG DEIS Band 1 schools is too small.

Learning Support/Resource Teaching in Irish

There was a high level of missing or invalid data on questions relating to the provision of LS/RT for Irish, e.g. many principals did not answer the question on the numbers of pupils expected to score at or below the 12th percentile, indicating that the question was not applicable as no standardised test was available in Irish.[33] This section focuses

[33] A standardised test in Irish for Irish-medium schools has become available since the administration of NAIMS (see *http://www.erc.ie/index.php?p=159*, last verified 29.03.2012).

on pupils for whom valid data were available but it is important to bear in mind that data used for this section are less reliable given that fewer pupils have valid data.

The following example illustrates the difficulties associated with using data from questions on LS/RT for Irish. For the purposes of the current analysis, in schools where principals indicated that nobody was at or below the 12th percentile but indicated that this was because no tests were administered, zero was recoded to invalid, as it is not known how many pupils would score at this level. In cases where principals wrote zero but did not include any comment, zeros were not recoded as it is unclear whether there were indeed no pupils at this level because all pupils were of a higher standard or whether there were no pupils known to be at that level because no test was carried out. About 38% of Sixth class SLG pupils and 55% in Gaeltacht schools were missing data on this question; a further third of pupils were in schools where the principal reported that nobody was expected to score at or below the 12th percentile in Irish. In schools where valid data were given (i.e. a percentage greater than or equal to zero), principals expected that on average, 2% of the total enrolment would score at or below the 12th percentile in Irish (Table 5.12).

Table 5.12: Mean school-level percentages of pupils in need/receipt of additional support in Irish, based on estimates provided by school principals[a]

	SLG	Gaeltacht
Estimated as at or below the 12th percentile:	2	2
Total in receipt of LS/RT for:	<1	2

[a]Not asked in NA '09 See e-App. Table A5.9 for standard errors.

A large majority of Sixth class pupils (78% in SLG and 87% in Gaeltacht) were in schools where the principal indicated that no pupils get LS/RT for Irish from a sanctioned Special Needs teacher.[34] This contrasts with the situation for English (2% of Sixth class pupils – SLG and Gaeltacht – were in schools where no pupil was in receipt of LS/RT in English) and mathematics (4% of Sixth class pupils in SLG and 15% in Gaeltacht schools were in schools where no pupil was in receipt of LS/RT for mathematics). On average, fewer than 1% of SLG pupils and 2% in Gaeltacht schools received LS/RT in Irish from a sanctioned Special Needs teacher (Table 5.12).

For a small number of schools, there was evidence that local arrangements were in place whereby pupils got assistance in Irish from somebody other than a sanctioned special needs teacher; e.g.

"We have a group scheme in place whereby everybody gets extra support in Irish";

"We give Irish support in the classroom";

"Support is paid for by the Board of Management only".

[34] In some cases principals responded 'not applicable' to the question on the numbers of pupils in receipt of additional support from a sanctioned Special Needs teacher. Where it was clear that this meant no pupils (e.g. by way of an additional comment from the principal), not applicable responses were coded to zero; i.e. no pupils are in receipt of this type of support. Also, in the single case where the principal wrote that all pupils get support in the classroom, this was recoded to zero as it was clear than no pupils get support in Irish from a sanctioned Special Needs teacher.

Provision of Support to Pupils and Parents

Looking at the ratio of pupils to LS/RT posts, a somewhat more favourable ratio was found in Gaeltacht schools (one post per 71 pupils) than in SLG (one post per 119 pupils) (e-App. Table E5.19). The corresponding figure in the NA '09 was one post per 92 pupils. Principals were advised to include shared positions when providing the number of sanctioned Special Needs teaching posts.

Teachers were asked about the means by which additional support was provided.[35] They reported that the most common means by which additional support for English and mathematics was provided was by withdrawing groups of pupils from the classroom. This approach was most widely used in both Second and Sixth class. About three-fifths of Sixth class pupils were in classrooms where additional support for English was provided in this way (Table 5.13). Group withdrawal had also been identified in NA '09 as the main way in which additional support was provided.

Less widely used methods of providing support in English and mathematics involved withdrawing individual students from the classroom or providing support in class. About one-third of Sixth class pupils in Gaeltacht schools were in classrooms where support for English or mathematics was most commonly provided by withdrawing individual pupils from the class. One-fifth of Sixth class SLG pupils were in classrooms where support for English was most commonly provided in class (Table 5.13). Although this percentage seems high relative to Gaeltacht schools and NA '09, it is important to keep in mind the large standard error associated with the percentage (e-App. Table A5.13). It was uncommon for teachers to report that no support was needed in English or mathematics or that no support was provided in these subjects; fewer than one in ten Sixth class pupils were in classrooms where this occurred.

In line with principals' reports discussed in the previous section, teachers' reports also showed that a large minority of pupils were in schools where no additional support was provided in Irish (Sixth class shown in Table 5.13). Teachers of Sixth class pupils also commonly indicated that no support was needed in Irish. In Gaeltacht schools where support in Irish was provided, individual withdrawal was reported to be the main approach used at Sixth class whereas in SLG, in-class support and group withdrawal were the most widely used approaches (Table 5.13). At Second class, group withdrawal was the most widely used approach for support in Irish in Gaeltacht schools while individual withdrawal and in-class support were the main approaches used in SLG (e-App. Table E5.20).

[35] About one-quarter of Sixth class pupils had missing data or invalid data on the means by which additional support was provided for English and mathematics. However, 52% of SLG and 57% of Gaeltacht Sixth class pupils had missing or invalid data on the provision of additional support in Irish. In some cases, teachers indicated that support was provided in a number of different ways, rendering their responses invalid as the question asked for the single option which best described how support was provided. Some teachers may have left the question blank if no additional support was available in the school, even though this was one of the response options offered. Percentages discussed in the text are the percentages of pupils with valid responses.

Table 5.13: Percentages of (all) Sixth class pupils whose teachers indicated that additional support in English, mathematics and Irish was mainly provided in various ways, by school type

	English			Maths			Irish[b]	
	SLG	Gael	NA '09	SLG	Gael	NA '09	SLG	Gael
Withdrawal from class – in a group	55	59	65	56	45	58	8	11
Withdrawal from class – individually	18	32	24	18	30	21	4	28
In-class support	21	7	5	14	16	11	11	4
No support needed	4	2	[a]	7	5	[a]	31	17
No additional support provided	1	0	5	6	4	9	47	41

[a]This option was not provided in NA '09

[b]Not asked in NA '09

About half of Sixth class pupils were in classrooms where teachers indicated that there was a great deal of coherence between pupils' class programmes and LS/RT programmes. A further third of Sixth class pupils were in classrooms where teachers indicated that there was some degree of coherence between the two. Percentages were similar in SLG and Gaeltacht schools.

Principals were asked whether or not their schools had run programmes for parents to support them in helping their child with English reading, Irish reading or mathematics. Support programmes in English reading were most common, although less so in Gaeltacht schools compared to SLG. While a large majority of Sixth class SLG pupils (84%) were enrolled in schools which provided a support programme in English reading, the corresponding percentage in Gaeltacht schools (46%) was significantly lower (Table 5.14). About two-thirds of Sixth class pupils in NA '09 attended schools which provided support programmes for parents in English reading.

Table 5.14: Percentages of Sixth class pupils enrolled in schools where parents were offered programmes to support their child's English reading, mathematics or Irish reading

	SLG	Gaeltacht	NA '09
English reading	84	46	65
Irish reading	49	39	–[a]
Mathematics	20	10	29

[a]Not asked in this assessment

Principals in Irish-medium schools were also asked about the provision of support programmes for parents in Irish reading. These were available in the schools of 40 to 50% of Sixth class pupils. Support programmes for parents in mathematics were comparatively less common; no more than 20% of Sixth class pupils were enrolled in Irish-medium schools which offered a support programme in mathematics to parents. Support programmes in mathematics were available to the parents of 29% of Sixth class pupils in NA '09.

Availability of Resources

Principals' and teachers' reports on the *availability* of technology and library books are examined in this section. The *use* of technology in teaching and learning is discussed in Chapter 6.

Technology

Principals were asked about the availability of computers and interactive whiteboards in central computer rooms and in classrooms or resource rooms. In addition, teachers were asked about the availability of technology in their own classrooms. All principals

reported that their school had at least one computer available for use by pupils. Most Sixth class pupils (87% in SLG; 96% in Gaeltacht schools; 76% in NA '09) were in classrooms with at least one computer (e-App. Table E5.21). Although the percentages were somewhat lower in Irish-medium schools at Second class than at Sixth class, the majority of Second class pupils were also in classrooms with at least one computer (77% in SLG; 78% in Gaeltacht schools; 77% in NA '09).

Looking at the overall ratio of pupils to computers in the school, a somewhat more favourable ratio was found in Gaeltacht schools (12 pupils per computer at Sixth class and 13 at Second class) than in SLG (23 pupils per computer at Sixth and Second class), although differences across school types were not statistically significant (e-App. Tables E5.22, E5.23). The pupil-to-computer ratios found in NA '09 (12.3 in Sixth class and 12.4 in Second class) were very similar to those found in Gaeltacht schools. No significant differences were found between the pupil-to-computer ratios in Irish-medium schools participating in the School Support Programme and those not participating in the programme (e-App. Table E5.24).

About one-fifth of Sixth class pupils in SLG and one-third in Gaeltacht schools were in schools where principals reported that there were no interactive whiteboards (IWBs) in the school. For a majority of pupils at Sixth class, there was an IWB in their own classroom (e-App. Table E5.25). Two-thirds of Sixth class SLG pupils were in classrooms with an IWB. In Gaeltacht schools, the figure was 56%. Percentages were lower at Second class: 53% of SLG pupils and 43% of Gaeltacht pupils were in classrooms where the teacher reported that there was an IWB.

A significantly more favourable pupil to IWB ratio[36] was found in Gaeltacht schools with an IWB (Sixth class: 44 pupils per school IWB; Second: 47) than in SLG with an IWB (Sixth class: 77 pupils per school IWB; Second: 76) (e-App. Table E5.26). Thus, while a higher percentage of Sixth class pupils in Gaeltacht schools attended schools with no IWBs, in schools with an IWB, the smaller average enrolment size of Gaeltacht schools means that the IWB was shared among fewer pupils. The ratio of pupils to interactive whiteboards in NA '09 was 63.5 (Second class) and 59.3 (Sixth class).

Digital projectors were less widely available in pupils' classrooms than either computers or interactive whiteboards. At Sixth class, 48% of SLG pupils and 42% of Gaeltacht pupils were in classrooms with a digital projector; the corresponding percentages at Second class were 45% and 37% respectively.

School and Classroom Libraries

School principals were asked a number of questions about school and classroom libraries in their schools. Class teachers were asked about classroom libraries. School principals were asked to indicate whether or not their school had a room which was used exclusively as a central school library and/or a room which was used as a library and for other purposes. As might be expected given the larger enrolment size of SLG, it was more common to have central school libraries in SLG than in Gaeltacht schools; about one-fifth of Sixth class SLG pupils and one-tenth of Gaeltacht pupils were in schools which had a central school library used exclusively for this purpose (Table 5.15). A further 16% of Gaeltacht pupils and 23% of SLG pupils were in schools with a library

[36] In schools where there were no IWBs, the ratio for pupils to IWBs was missing; thus, the average ratio is the average across schools with at least one IWB available.

room which was not used exclusively as such; e.g., it was also used for resource teaching. We do not have data on the numbers of books held in central school libraries.

Principals' reports indicated that the majority of Sixth class pupils were enrolled in schools where there were classroom libraries in every classroom (Table 5.15). Teachers were asked more detailed information on the size of their classroom libraries. Based on teachers' reports, the quantities of English and Irish books in the classrooms of Sixth class pupils were found to vary considerably across schools. In SLG, 90% of Sixth class pupils were in classrooms with between 75 and 450 books in the classroom library; the corresponding range in Gaeltacht schools was 135 to 742 (Table 5.15)[37]. On average, Sixth class pupils in Gaeltacht schools had access to a significantly higher number of English books, Irish books and books overall in their classrooms than SLG pupils (Table 5.15). In addition, they had, on average, a significantly more favourable books-to-pupil ratio. Although Gaeltacht pupils had greater access to books in their classrooms, it is likely that SLG pupils had greater access to books in the school library given the greater prevalence of central libraries in SLG than in Gaeltacht schools; unfortunately, as noted above, data are not available on the numbers of books held in central libraries.

Table 5.15: Characteristics of school and classroom libraries of Sixth class pupils, by school type

		SLG		Gaeltacht
Data provided by school principals		%		%
Room used exclusively as a central school library		22		10
Room used as school library and also for other purposes (not exclusively library)		23		16
Classroom library in some classrooms		5		6
Classroom library in every classroom		92		88
Data provided by class teachers	Mean	90% range	Mean	90% range
Total books in classroom libraries[1]	252	75 – 450	434	135 – 742
English books[1]	191	40 – 350	338	90 to 600
Irish books[1]	60	10 – 100	93	20 – 180
Other language books[1]	1	0 – 4	2	0 – 4
Books-to-pupil ratio (all books in classroom)[1]	9.8	2.7 – 20	27.9	5.8 – 60.0

[1]Does not include school library

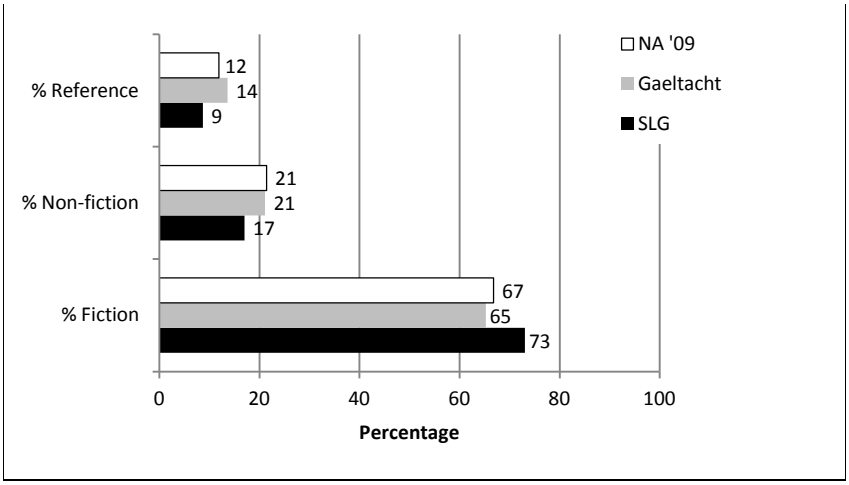
It is interesting to note that there were a greater number of English books than Irish books in the classrooms of Sixth class pupils in both SLG and Gaeltacht schools. Not surprisingly, given the very low percentages of pupils in Irish-medium schools who spoke languages other than Irish or English at home (see Chapter 4), classroom libraries had few books in languages other than Irish or English: 90% of Sixth class pupils were in classrooms with four or fewer other language books.

Teachers in Irish-medium schools were asked to indicate separately for English and Irish classroom library books, the percentages of books which were fiction, non-fiction and reference. In NA '09, no breakdown by language was sought. Fiction accounted for between two-thirds and three-quarters of the English classroom library books of both Second and Sixth class pupils (Sixth class shown in Figure 5.3). About one-fifth of the Sixth class English classroom library books were described by teachers

[37] See e-App. Table E5.29 for Second class data.

as non-fiction and up to one-seventh were classified as reference books. The corresponding percentages of Irish books in each category were very similar. At Second class, between one-fifth and one-quarter of English books were described as non-fiction and about one-in-ten as reference books.

Figure 5.3: Percentages of classroom library books in English[1] which are fiction, non-fiction and reference books (Sixth class pupils), by school type



[1]In NA '09, teachers were not asked to distinguish between English, Irish and other language books so percentages relate to percentages of total library books.

Assessment and Feedback

Data from school principals show that most pupils completed at least one standardised test in English and mathematics during the 2009-10 school year; only a very small minority of Sixth class pupils were in schools where standardised tests in these two subjects were not administered at least once per year from First class onwards (see Table 5.16 for English and e-App. Table E5.30 for mathematics). It was more common for principals to report that standardised testing was not conducted in Senior Infants than in any other grade (the difference between the percentages not tested in Senior Infants in SLG and in Gaeltacht schools is not statistically significant. Note also that while percentages in the 'not tested' category in the NA '09 (Table 5.16) appear larger than those in Irish-medium schools, once standard errors are considered, differences are not statistically significant.

Teachers of pupils participating in the assessment were also asked about the use of standardised tests and to indicate how many times Second and Sixth class pupils would take standardised tests in English, mathematics and Irish in the current school year. Similar to principals' reports, a majority of Sixth class pupils were in classrooms where it was expected that one standardised test in English and one in mathematics would be carried out. Teachers of two-fifths of Sixth class SLG pupils and two-thirds of pupils in Gaeltacht schools indicated that no standardised test in Irish would be administered. Although somewhat higher percentages of pupils (57% of Sixth class SLG pupils and 80% of Gaeltacht pupils) were in schools where principals indicated that no standardised tests in Irish were carried out in the past school year, differences between principals' and teachers' reports are not statistically significant.

The results of standardised tests can be examined from two viewpoints – that of the individual pupil and that of the class or school average. Principals reported that

the most common use of individual test results in English was to identify pupils with learning difficulties. All Sixth class pupils were in schools where the principal indicated that this took place (Table 5.17). Individual-level results were also commonly used to give feedback to parents: 82% of Sixth class pupils in Gaeltacht schools and over 90% in SLG and NA '09 attended schools where test results in English were used for this purpose (Table 5.17). It was less common for individual test results in English to be used to give feedback to pupils: only 51 to 57% of Sixth class pupils were in Irish-medium schools where this was reported to take place (Table 5.17). However, pupils were given feedback on English tests more frequently in Irish-medium schools than in schools involved in the NA '09; only 30% of Sixth class pupils in NA '09 were reported to get feedback on standardised tests results in English.

Table 5.16: Principals' reports on the annual frequency with which standardised English tests are administered to various grade levels in their school – percentages of pupils in schools attended by Sixth class pupils

	SLG				Gaeltacht schools				NA '09
	Not tested*	Once	Twice	At least three times	Not tested*	Once	Twice	At least three times	Not tested*
Senior Infants	31	67	2	0	11	77	11	0	32
1st	3	76	19	2	4	66	30	0	9
2nd	2	79	14	5	3	69	25	3	5
3rd	2	83	15	0	3	70	23	4	4
4th	3	80	17	0	3	70	23	4	5
5th	2	81	18	0	3	70	23	4	4
6th	5	77	15	3	6	69	21	4	9

*Principals who indicated that the grade level was not offered in their school are not included in the percentages for "Not tested".

Table 5.17: Percentages of Sixth class pupils whose principal teachers reported varying uses of standardised test results in English, by school type

		SLG	Gaeltacht	NA '09
Individual results	Used to identify pupils with learning difficulties	100	100	100
	Used for feedback to parents	93	82	98
	Used for feedback to pupils	51	57	30
Aggregated results	Discussed at staff meetings	90	100	92
	Used to monitor school-level performance	92	96	93
	Used to establish targets	86	100	74

Looking at the use of test results from the point of view of the school or class average, the majority of pupils were in schools where principals reported that aggregated results of standardised tests in English were discussed at staff meetings (Table 5.17). Results of standardised tests in English were also reported to be very widely used to monitor school-level performance. Furthermore, large majorities of pupils were enrolled in schools where English test results were used to establish targets for teaching and learning.

The percentages of Sixth class pupils in schools where results of standardised tests in mathematics were used to give feedback to pupils and parents, to identify pupils with difficulties and to monitor school-level performance were very similar to

the percentages in schools where English test results were used for these purposes. As noted above, the administration of standardised tests in Irish was comparatively less common than the administration of tests in English and mathematics, so data from Irish tests were not widely available for discussion at staff meetings or for other purposes such as providing feedback to parents.

Beginning of Formal Reading Instruction

Most pupils were in schools where the principal indicated that the School Development Plan included written statements on the beginning of formal instruction in English (100% of Second class SLG pupils, 87% in Gaeltacht schools), formal instruction in Irish reading (98% of Second class SLG pupils, 94% of Gaeltacht pupils) and teaching mathematics through Irish (74% of Second class SLG pupils, 88% in Gaeltacht schools) (e-App. Table E5.31). Principals in Irish-medium schools were also asked about school policy on the language in which formal reading instruction began in the school. The 1999 Curriculum (DES/NCCA, 1999b) advises against beginning formal reading instruction in both Irish and English at the same time, though, as noted in Chapter 1, soon after the introduction of the Primary School Curriculum in 1999, Ní Bhaoill and Ó Duibhir (2004) reported that 58% of schools introduced reading in Irish first, 34% in English first, and 6% in both Irish and English. Subsequent to this, Ó Laoire and Harris (2006) reported that schools themselves may select the most appropriate language for initial reading instruction in their particular context, and that there may no single correct (one-size-fits-all) answer to the question of in which language reading should be taught initially in Irish-medium schools.

Figure 5.4: Percentage of Second class pupils in schools where it is school policy to begin formal instruction in reading in English and/or Irish

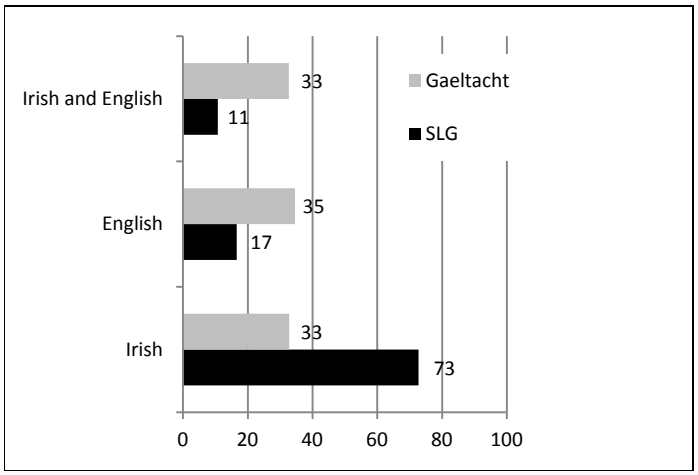


Table 5.18: Average reading scores of pupils in schools where the policy was to begin reading instruction in Irish, English, or Irish and English together

		SLG	Gaeltacht
Second	Irish	269	257
	English*	262	248
	Irish and English	255	254
Sixth	Irish	267	255
	English*	264	267
	Irish and English	263	**249**

Scores in bold are *significantly* different from the mean for the reference (*) category

In SLG, principals reported that reading instruction most commonly began in Irish. Of Second class SLG pupils, almost three quarters were in schools where reading instruction began in Irish (Figure 5.4). It was comparatively less common for reading instruction to begin in Irish and English together in SLG: just one in ten Second class pupils were in SLG where this occurred. One-sixth were in SLG where reading instruction began in English. In Gaeltacht schools, the percentages of Second class pupils in each of the three categories (begin in Irish only, English only or Irish and English) were broadly similar; about one-third of pupils were in each.

In SLG, there were no significant differences in the average reading achievement of either Second or Sixth class pupils who attended schools where the policy was to begin reading instruction in Irish, English or Irish and English together (Table 5.18). In Gaeltacht schools, Sixth class pupils who attended schools where the policy was to begin reading instruction in English and Irish together had a significantly lower average reading score than pupils in schools where the policy was to begin reading instruction in English only. The difference amounted to approximately one-third of a standard deviation. There were no statistically significant differences at Second class in Gaeltacht schools (Table 5.18). Looking at achievement in mathematics, there were no significant differences in the mean scores of pupils in schools where the policy was to begin reading instruction in English, those in schools where the policy was to begin in Irish or those in schools where instruction took place through a mix of English and Irish (e-App. Table E5.34).

Principals reported that pupils typically began English reading instruction in Junior or Senior Infants. About one-third of Second class SLG pupils and half in Gaeltacht schools were enrolled in schools where it was school policy to begin English reading instruction in Junior Infants; 43-58% were in schools where it was the policy to begin English reading instruction in Senior Infants (Table 5.19). One in ten Second class SLG pupils were in schools where the principal indicated that reading instruction in English did not begin until First class. A tiny minority (5%) of Second class pupils in Gaeltacht schools were in schools where the principal reported that formal instruction in English reading did not begin until Second class. No significant differences in reading achievement were associated with the class level at which formal instruction in English was reported to begin (e-App. Table E5.36). Detail on the term (i.e. September to December, January to Easter or Easter to June) in which formal English reading instruction began is given in e-App. Table E5.37.

Table 5.19: Percentages of Sixth class pupils in schools where formal instruction in English and Irish reading began in various grades

			English reading instruction begins in…				
			JI	SI	1st	2nd	Total
SLG	Irish reading instruction begins in…	JI	18	34	3	0	56
		SI	13	22	7	0	43
		1st	0	2	0	0	2
		2nd	0	0	0	0	0
		Total	31	58	10	0	100
Gaeltacht	Irish reading instruction begins in…	JI	25	11	2	0	37
		SI	16	22	0	0	38
		1st	10	9	0	0	19
		2nd	0	1	0	5	6
		Total	51	43	2	5	100

School policy in most schools determined that Irish reading instruction also began in Junior or Senior Infants. Only 2% of Second class SLG pupils were enrolled in schools where this was not the case. A higher percentage of Second class pupils in Gaeltacht schools (25%) were in schools where formal instruction in Irish reading did not begin until First or Second class (Table 5.19). Detail on the term in which formal Irish reading instruction began is given in e-App. Table E5.37.

Challenges in Teaching English and Mathematics

Principals were asked to indicate the three issues which constituted the greatest challenges encountered by their schools in the provision of teaching and learning in English and mathematics.[38] These are examined in turn.

In relation to challenges in teaching English, over half of principals (59%) in SLG cited issues relating to the bilingual context of their schools; this area was identified by one-quarter of principals in Gaeltacht schools (Table 5.20). Issues related to the bilingual environment of the school can be further subdivided into five categories: few opportunities for incidental learning, as English is not used as general language of instruction (14% of SLG principals, 2% in Gaeltacht schools); pupils' limited English vocabulary and difficulties in providing sufficient opportunities for spoken English (12% and 0%, respectively); attaining a balance between emphasis on English and Irish and transfer from one language to the other (12% and 15%, respectively); having adequate time for English in Irish-medium schools (8% and 0%, respectively); and general issues in bilingual education (12% and 7%, respectively). General issues in bilingual education included, for example:

> "If pupils have difficulty with English, should they be attending a Gaelscoil?"
>
> "As pupils don't hear a lot of English early on, it takes time to identify Speech and Language delay."
>
> "Attaining fluency in English and enjoying the language is a challenge."

Looking at the issues raised by principals in Gaeltacht schools, specific curricular areas were most frequently cited as challenges; these were identified by about one-third of principals in Gaeltacht schools compared to about one quarter in SLG (Table 5.20). Of the specific areas mentioned, spelling or phonics was the most common, identified by one-eighth of principals in Gaeltacht schools and one-in-ten SLG principals. A higher percentage of principals in Gaeltacht schools identified pupils' attitudes towards, and interest in English reading (29% versus 12% in SLG) and pupils with special educational needs (22% versus 12% in SLG).

Between about one-fifth (Gaeltacht schools) and one-third (SLG) of principals cited issues relating to pupils' home environments as presenting challenges to the teaching of English. These included:

> "Parents not spending enough time helping their child with English reading"
>
> "Not enough time spent with young children on nursery rhymes and fairytales"

[38] Discussion in this section is based on unweighted data and is intended to illustrate the main challenges cited by principals rather than to be accurately generalisable to the population of pupils. Where a principal cited two or more reasons belonging to the same category/sub-category, the school was counted in the category/sub-category once only.

"Lack of interest at home".

About one-fifth of principals identified curriculum overload as one of the key challenges in the teaching of English. A similar percentage of principals cited challenges which could not be easily classified under any of the existing categories, such as "selecting textbooks", "fostering self-confidence in speaking, reading and writing", "using technology in teaching" and "children from different backgrounds".

It is interesting to note that while a lack of home support was also identified as an issue in NA '09, the other main issue identified in that study – large class sizes – did not emerge as an important concern of principals in Irish-medium schools. Other challenges identified by principals in NA '09 which specifically related to the teaching of English were: oral language problems, reading not viewed as interesting, and problems with the English curriculum. These issues were also identified by principals in Irish-medium schools.

The main difficulty in teaching mathematics referred to by SLG principals related to the language of mathematics (Table 5.21). In this context, principals cited issues such as a mismatch between the Irish of the textbook and the dialect familiar to their pupils, the variety of terms for a single construct (e.g. an even number can be translated as 'ré-uimhir' or 'uimhir cothrom'), and the complexity of terms in Irish. Other issues identified by a sizeable proportion of SLG principals included the availability of suitable materials in the Irish language (30% of principals), problem-solving (26%), home support (15%), and a general lack of resources (15%).

The issue of teaching in multigrade classrooms was more often cited by principals in Gaeltacht schools (25% of principals) than by principals in SLG (2%). Other issues commonly mentioned in Gaeltacht schools were a lack of time and the breadth of the curriculum (21%), specific curricular topics, e.g. fractions and decimals (19%), problem solving (19%) and the language of mathematics (19%).

Issues identified in NA '09 which specifically related to the teaching of mathematics were: lack of physical space or people (e.g. to engage with concrete materials); problems with higher-level mathematics skills (e.g. problem-solving, reasoning); oral language problems (e.g. poor reading skills or a lack of understanding of mathematical language); and problems with basic mathematics skills (e.g. computation, tables). These issues were also noted by principals in SLG and Gaeltacht schools, although principals in Irish-medium schools placed a greater emphasis on language issues and concerns about problem-solving than on a lack of physical space.

One-fifth of SLG principals and one-third in Gaeltacht schools identified diverse issues regarding the teaching of mathematics which were not easily grouped with other comments. These included comments such as: "Should we throw out the calculators?"; "Ensuring that the right amount of emphasis falls on the right skills"; "There's no challenge like it (teaching mathematics)!", "More and improved use of the Smartboard", and "Achieving a high standard in maths". One principal questioned why many pupils who had been very good at mathematics at primary level went on to the local all-Irish post-primary and failed to do Honours level mathematics in the Leaving Certificate. She noted that these pupils had begun Honours level but later switched to Ordinary level prior to taking the examination. This comment appears to relate more to the teaching and learning of mathematics at post-primary level generally rather than to the teaching and learning of mathematics through Irish.

Table 5.20: Challenges for the teaching of English (Principals' comments) – Percentages of principals[1] in each category, by school type

Category	Subcategory or example responses	SLG	Gael
1. Issues specific to bilingual education		59	24
	(a) Fewer opportunities for incidental learning of English	14	2
	(b) Pupils' limited vocabulary and difficulties in providing opportunities for spoken English	12	0
	(c) Attaining a reasonable balance between Irish and English; transfer from one language to the other	12	15
	(d) General issues in bilingual education	12	7
	(e) Constraints on time spent teaching English as Irish is main language of instruction	8	0
2. Home supports	"Parents do not spend enough time helping their children with English reading" "Children from disadvantaged backgrounds don't get enough support at home"	31	22
3. Specific curricular areas		27	34
	(a) Spelling/phonics	10	12
	(c) Reading comprehension	6	2
	(b) Vocabulary	4	5
	(c) Grammar	4	5
	(e) Other aspect of language	2	10
Curriculum overload, time generally	"Not enough time – too many subjects in primary school" "Very broad curriculum - difficult to cover everything"	18	20
Lack of specific reading resources	"A lack of finance and space for a school library" "Availability of informal tests"	12	7
Attitudes towards and interest in reading	"Difficult to inspire interest in reading when pupils have access to so many other things – Nintendo, iPod, mobiles "	12	29
Differentiation, pupils with special needs	"Focusing on the pupils that fall below 20% of the Micra Ts" "High level of dyslexia in the school" "Differentiation because of the child's ability, as well as their different levels of Irish"	12	22
Problems with the English curriculum	"Gaps in the phonics programmes in the higher classes – Jolly Phonics from Junior Infants to 2nd class" "The curriculum is too open-ended"	10	2
Oral language difficulties	"Poor standard of spoken language resulting from TV, computers and a lack of conversation", "Oral language"	8	10
Accessing specialist services	"If they need help, the system is very slow" "A lack of services to address language problems"	6	2
General resource issues	"We are in temporary accommodation – much of school's resources have been spent on this in past 25 years" "A lack of a full time secretary" "A lack of modern resources in the school"	4	12
Achieving and maintaining high standards	"Achieving a high standard in English writing, reading and spoken language" "That all pupils will have a high standard of reading"	6	17
Multigrade classes	"Multigrade classes and the principal teaching" "Third to Sixth classes together in one room"	2	17
Other issues	"Using technology in our teaching", "Children from different backgrounds"	16	20

[1]A school is included once only in each category even if principal cited two or more reasons in same category. Percentages given are percentages of schools with a valid response. Percentages do not sum to 100 as principals provided multiple responses. Principals from 49 SLG and 41 Gaeltacht schools provided comments on the challenges of teaching English.

Table 5.21: Challenges for the teaching of mathematics (Principals' comments) – Percentages of principals in each category, by school type

Category	Example responses	SLG	Gael
Language of mathematics	"Specific complexities of Irish mathematical language, e.g. 2=dó/dhá/beirt, 4=ceathair/ceithre" "A lack of consistency between textbooks in terms of language; e.g. ré-uimhir, uimhir cothrom"	62	19
Availability of suitable Irish language textbooks/ resources	"The variety of resources available in English is not available in Irish" "The lack of choice of materials and workbooks in Irish"	30	12
Problem solving	"Developing problem-solving skills" "Problem solving – reading the question, extracting the relevant information and then solving the problem"	26	19
Home support	"A lack of help from home for pupils" "Parents don't have language skills to help children" "Parents teaching maths through English at home"	15	6
Cutbacks, lack of resources	"Lack of support – cuts in cuiditheoirs" "More equipment needed in Irish and English"	15	10
Teaching through Irish, but need for English	"Maths terminology in Irish at primary level, English at post-primary" "Learning through Irish and tests done through English"	13	10
Specific topics, e.g. tables, numbers	"More emphasis should be placed on learning tables by heart", "Improving mental maths" "Understanding of numbers, e.g. fractions and decimals"	11	19
Differentiation	"Different ability levels of pupils" "Addressing the wide range of ability"	9	15
Low achievers, students with special needs	"Reducing the numbers of pupils falling below 20% in standardised tests", "Support for weaker pupils"	9	13
Improving pupils' interest and self-confidence in mathematics	"Developing a positive outlook towards maths as well as an appreciation of the practical aspects" "That the pupils will have self-confidence regarding their mathematical ability"	9	10
Poor textbooks (not specifically related to Irish language issues)	"Using different books – no one book is suitable by itself" "Not enough practice in the textbooks"	8	2
Large classes	"Large class sizes" "Dealing with large classes when using concrete materials and attending to the children's needs"	6	2
Time and curriculum breadth	"Lack of time to teach the course" "Such a full timetable and the resulting pressures" "A wide programme of maths to cover"	6	21
Linking mathematics to the real world	"To prepare the kids for the maths skills that they will need in the real world" "A lack of understanding of the connection between maths and general life"	6	6
Multigrade classes	"Covering the curriculum in multigrade classes" "Dealing with two classes at the same time and different groups within them", "Four different classes in the room"	2	25
Other issues	"To ensure active learning for each child", "Should we throw out the calculators?", "Principal has teaching responsibility"	21	33

[1]A school is included once only in each category even if principal cited two or more reasons in same category. Percentages given are percentages of schools with a valid response. Percentages do not sum to 100 as principals provided multiple responses. Principals from 53 SLG and 52 Gaeltacht schools provided comments on challenges in teaching mathematics.

Key Points

This chapter described some of the main characteristics of the teaching and learning environments of Second and Sixth classes in Irish-medium schools.

- Almost all Gaeltacht schools were located in villages or rural areas. There was a greater tendency for SLG to be located in urban areas. About two-fifths of Sixth class SLG pupils attended schools located in cities and a further quarter attended schools located in large towns.
- Over 90% of Sixth class SLG pupils attended schools which were not participating in the School Support Programme (SSP) under DEIS. At both Second and Sixth class, non-SSP pupils in SLG achieved significantly higher mean scores in reading and mathematics than SSP pupils.
- Slightly under half (44%) of Sixth class pupils were in Gaeltacht schools participating in the rural dimension of the SSP. The only significant difference in achievement between pupils in *SSP* Gaeltacht schools and those in *non-SSP* Gaeltacht schools was in reading at Second class, where pupils in non-SSP schools had a significantly higher mean score.
- The average school socioeconomic status (SES) of SLG was significantly higher than that of Gaeltacht schools. It was also significantly higher than the corresponding school average SES of schools participating in the NA '09.
- Teachers in Gaeltacht schools had significantly more teaching experience on average than teachers in SLG. At Second class, the difference was ten years and at Sixth class, it was eight years.
- In general, across SLG and Gaeltacht schools, the number of professional development days taken by teachers was low, although similar to that found in NA '09. The average number of days of professional development undertaken by teachers was significantly higher in Gaeltacht schools than in SLG. This may relate to additional support provided by the PPDS to Gaeltacht schools in the use of Séideán Sí.
- Similar to NA '09, teachers reported lower levels of confidence in using computers to teach English and mathematics.
- Principals reported that, on average, very few pupils in Irish-medium schools (2% or fewer) spoke languages other than English or Irish at home and received English language support.
- Principals indicated that about one-in-seven Sixth class pupils in Irish-medium schools were in receipt of Learning Support (LS) or Resource Teaching (RT) for English. About one-in-ten pupils were in receipt of LS/RT for mathematics. These percentages are similar to the corresponding percentages in NA '09. LS/RT was not widely available for Irish.
- Principals in a large majority of schools indicated that from First class onwards pupils undertook at least one standardised test in English and in mathematics each year. The use of standardised tests in Irish was much less common. A standardised reading test in Irish for Irish-medium schools was unavailable at the time of the NAIMS assessment but became available later in 2010.

- Three-quarters of Second class SLG pupils were in schools where principals reported that reading instruction began in Irish. It was less common for principals of SLG to report that reading instruction began in English only (17% of Second class pupils were in such schools) or Irish and English together (11% of Second class pupils). In Gaeltacht schools, each of the three options was equally popular with about one-third of Second class pupils in schools where reading instruction began in Irish only, approximately one-third in schools where instruction began in English only and one-third in schools where reading instruction began in Irish and English together. In general, the language in which reading instruction began was not associated with achievement in reading.
- Key challenges in the teaching of English, as reported by principal teachers in Irish-medium schools, included issues related to bilingual education (e.g., limited opportunities for incidental learning, attaining a balance between emphasis on English and Irish), concerns about spelling/phonics knowledge, and addressing special educational needs. In mathematics, the language of mathematics, including the complexity of terminology in Irish, was frequently raised, while the breadth of the mathematics curriculum was specifically raised by principals in Gaeltacht schools.

Chapter 6
Teaching and Learning English and Mathematics

The main focus of this chapter is on the responses of teachers to specific questions on the teaching and learning of English and mathematics. Where possible, comparisons are made with teachers' responses to questions on the teaching and learning of Irish. Occasional reference is made to data from the pupil questionnaire where this complements the information available from the teacher questionnaire.

There are six main sections in this chapter. The first summarises teachers' responses to questions about planning lessons in English and mathematics. The second section examines the languages through which teachers reported teaching mathematics and issues associated with teaching mathematics through the medium of Irish or English. Reference is made to pupil questionnaire responses on attitudinal items about learning mathematics through Irish. The third section outlines the resources which teachers reported using in teaching English and mathematics. Specifically, these are: the time spent on English, mathematics and Irish; materials used in teaching English and mathematics; and the use of technology in each of the three subjects. While the first section relates to materials used in the *planning* of lessons, the third section deals with items used *in the course of* lessons. Section four summarises teachers' use of grouping practices, section five outlines the methodologies used in teaching English and mathematics, and section six describes teachers' use of non-standardised assessments in English, mathematics and Irish.

As in Chapter 5, this chapter reports data at the *pupil* level; i.e. rather than saying that "Only 15% of Sixth class teachers did X", we say that "Only 15% of Sixth class pupils were in classrooms where teachers did X".

The main focus in this chapter is on Sixth class pupils. Where data are not provided in the main text for Second class pupils, they are provided in the e-Appendix.

Planning

Teachers were asked to list the three main resources they had used to plan English and mathematics lessons with the target grade in the week preceding the NAIMS assessment. This question was open-ended and focussed on the planning of lessons rather than the implementation (see section on 'Subject-Specific Resources' for materials used during the course of lessons). Teachers' responses were grouped into conceptually-related categories. For the most part, the same categories were used in NAIMS as had been used in NA '09 in order to facilitate comparisons between the two; however, as with the application of any open-ended coding system, some variation may have occurred across coders and across the different time-points.

As in NA '09, textbooks were the most commonly used resource in planning English lessons at both Second and Sixth class in Irish-medium schools (Sixth class shown in Table 6.1, Second class in e-App. Table E6.1). Internet materials were also widely used; these were used by teachers of between half and two-thirds of Sixth class pupils. Real-life materials were the second most commonly used resource in planning English lessons at Sixth class in Gaeltacht schools.

Between one-third and one-fifth of Sixth class pupils were in classrooms where teachers indicated that they had used teacher handbooks, class novels, real-life materials or the curriculum in planning for English lessons (Table 6.1). Sixth class teachers reported less widespread use of non-text based materials and their own notes than Second class teachers; teachers of about 20% of Second class pupils in Irish-medium schools indicated that they used their own notes or notes from a colleague in planning English lessons compared to teachers of not more than 5% of Sixth class pupils.

Table 6.1: Percentages[a] of Sixth class pupils in schools where teachers indicated that particular resources were used for planning English lessons in the week prior to NAIMS, by school type

	SLG	Gaeltacht	NA '09
Textbook	86	79	74
Internet (not including interactive whiteboards)	66	50	62
Teacher handbook, resource books or workbooks accompanying reading schemes	35	26	23
Class novel or other books/novels[b]	30	25	35
Real-life materials, newspapers or magazines	26	55	35
Curriculum content/ teacher guidelines	22	27	22
Non-text based materials; e.g. project work, posters, digital texts. Includes interactive whiteboards	8	8	7
Teacher notes	5	3	8
Other; e.g. Secondary school entrance exam; quiz; debate	0	9	2

[a]Percentages are based on categories derived from teachers' open-ended responses. Where possible, categories used in NAIMS were those used in NA '09

[b]In NA '09, this category was 'other texts/books/novels'

Table 6.2: Percentages[a] of Sixth class pupils in schools where teachers indicated that particular resources were used for planning mathematics lessons in the week prior to NAIMS, by school type

	SLG	Gaeltacht	NA '09
Class textbooks / teacher's book	92	85	94
ICTs (not interactive whiteboard), e.g., Internet, software	48	27	33
Curriculum / teacher guidelines	37	27	37
Materials designed for teaching mathematicss, e.g. compass, fraction wall, trundle wheel	21	26	18
Worksheets / workbooks / photocopied sheets	12	25	10
Interactive whiteboards	11	17	7
Real-life materials, e.g. clocks, newspapers, sales notices	11	10	17
Teacher notes / own notes	8	12	14
Assessment materials, e.g. teacher-designed questions, entrance exams, checklists	6	7	6
Mathematics games	3	6	3
Other textbooks / post-primary textbooks	3	13	18
Calculators	3	11	4
School plan / scheme	0	3	2
Other	11	5	2

[a]Percentages are based on categories derived from teachers' open-ended responses. Where possible, categories used in NAIMS were as in NA '09

Textbooks were also the most widely used resource in planning mathematics lessons at Second and Sixth class. At least 85% of Sixth class pupils were in classrooms where teachers indicated that the textbook was one of the main resources used in planning the previous week's lessons (Table 6.2). Other commonly used resources

were ICTs, curriculum content/teacher guidelines, materials designed for teaching mathematics and workbooks or worksheets. There was somewhat less use of real-life materials at Sixth class compared to Second. At Second class, one-fifth to one-quarter of pupils were in classrooms where teachers indicated that they had used real-life materials, such as clocks, coins or timetables, in planning mathematics lessons (e-App. Table E6.2). The corresponding figure at Sixth class in Irish-medium schools was about 10%, and in NA '09 it was 17%.

Language of Mathematics Teaching

Teachers of Second and Sixth class pupils in Irish-medium schools were asked whether or not they taught mathematics through Irish only, English only, or through a mix of Irish and English. No pupils were in classrooms where teachers indicated that they taught mathematics through English only. At Second and Sixth class in Gaeltacht schools, about half of pupils were in classrooms where teachers reported teaching through Irish only and about half were in classes where mathematics instruction was provided through a mix of English and Irish (Table 6.3). A large majority of Second class pupils in Scoileanna Lán-Ghaeilge (SLG) were in classrooms where mathematics was taught through Irish only but there is a notable decline in the teaching of mathematics through Irish only by Sixth class where almost half of pupils in such schools were in classrooms where mathematics was taught through a mix of English and Irish.

Teachers were asked to provide explanations for why they taught through a mix of English and Irish rather than exclusively through Irish (in classrooms where this was the case) or to indicate problems (if any) with teaching mathematics exclusively through Irish (where relevant). In a small number of cases, teachers who had indicated that they taught through Irish only went on to give an explanation for why they used English and Irish in certain cases; e.g. "I give pupils terms in English before the standardised test", and "In cases of difficulty, I explain in English". It is interesting that these teachers considered their teaching to be through Irish rather than a mix of Irish and English, despite occasionally providing terminology in English. As it is likely that these teachers taught mainly through Irish, their responses to the question on the language of teaching mathematics were not changed from *Irish* to *a mix of Irish and English*. This issue highlights the problem of how questions may have been interpreted differently by different teachers. Even among teachers who selected *a mix of Irish and English*, there may be great variation in the proportion of time spent using each of the languages, e.g. it may be that terminology was occasionally provided in English or that English was used for a considerable amount of mathematics teaching.

Table 6.3: Percentages of pupils whose teachers indicated that instruction in mathematics is provided in Irish only[1] or in a mix of English and Irish, by school type

	SLG		Gaeltacht	
	Irish only	Mix of English and Irish	Irish only	Mix of English and Irish
Second	82	18	45	55
Sixth	53	47	50	50

[1]No pupils were taught mathematics through English only.

Looking only at pupils in classrooms where a mix of languages was used for teaching mathematics, the most common reason given by Sixth class teachers in SLG for not using Irish only related to the fact that a majority of pupils would go on to a post-primary school where English was the language of instruction (Table 6.4). Of Sixth class

SLG pupils taught with a mix of Irish and English, over half were in classrooms where teachers indicated that this was the reason for not using Irish exclusively. The next most commonly cited reason at Sixth class in SLG related to the ease with which pupils could connect English terms to everyday life and the need to have terms in English for life. In the classrooms of about one-in-eight Sixth class SLG pupils where a mix of languages was used, teachers identified the difficulty of Irish language terms and the lack of resources available in Irish as reasons for not using Irish exclusively.

Table 6.4: Reasons cited by teachers for not using Irish only in mixed language mathematics classes – percentages[1] of Sixth class pupils, by school type

	Example responses	SLG	Gaeltacht
Post-primary school through English	"The majority of the class will go to an all-English secondary school so I think it is important for them to have the language of maths in English as well as Irish"	56	20
Easier to link English terms to real-life/need English terms for life	"Pupils can make the connection between real-life situations and the English terms, e.g. VAT"	29	15
Difficulty of Irish language in books	"Sometimes I think the terms in Irish make maths more difficult"	15	3
More choice of resources in English	"Lack of extra books in Irish" "Standardised tests we use are in English"	12	4
Pupils' insufficient level of Irish	"I don't have confidence in the level of Irish of the pupils"	6	36
No Irish at home	"There's quite a few parents without Irish to help with homework"	5	17
Special needs or language difficulties	"To help weaker pupils"	3	24
Other	"I use English for pupils to get clearer meaning"; "better understanding in English"; "School began using Irish textbooks 6 years ago so only as far as 4th class so far".	10	11

[1]Percentages do not sum to 100 as teachers may have provided more than one reason for teaching mathematics through a mix of English and Irish

At Second class (e-App. Table E6.3), SLG teachers most commonly cited general points on the importance of having English terms for life outside of school and indicated that using both languages benefited pupils with poor levels of Irish. The lack of resources and standardised tests in Irish were also mentioned in this context by Second class teachers in SLG.

At both Second and Sixth class in Gaeltacht schools, the most commonly cited reason for using a mix of languages rather than Irish exclusively related to pupils' levels of proficiency in Irish. In classrooms where a mix of languages was used, teachers of about half of Second class pupils and one-third of Sixth class pupils indicated that they did not have sufficient confidence in pupils' levels of Irish in order to teach mathematics exclusively through the language (Sixth class shown in Table 6.4, Second class in e-App. Table E6.3). Teachers of about one-quarter of Sixth class Gaeltacht pupils in classes where a mix of languages was used indicated that the use of both Irish and English aided pupils with Special Educational Needs. The issue of pupils progressing to a post-primary school where the language of instruction was English was cited by teachers of one-fifth of Sixth class Gaeltacht pupils in classrooms where Irish and English were used.

Teachers who indicated that they taught mathematics exclusively through Irish were asked to indicate the problems, if any, that they had in doing this. Teachers of

about 80% of Sixth class SLG pupils who were taught exclusively through Irish identified at least one issue. The percentage was higher in Gaeltacht schools: teachers of 95% of Sixth class pupils who were taught mathematics through Irish identified at least one problem with this.

Looking only at pupils who were taught through Irish and whose teachers identified at least one issue with this, the most common problem which was identified in both SLG and Gaeltacht schools was the issue of vocabulary (e-App. Table E6.4). Sixth class teachers cited issues such as "different terms for the same thing", "different dialects" and "the complexity of language used in the textbooks". Of Sixth class pupils in classrooms where Irish was used exclusively for mathematics instruction, about half in SLG and two-thirds in Gaeltacht schools had teachers who identified issues with vocabulary as a challenge in teaching mathematics through Irish. Of Second class pupils in classrooms where Irish was the language of instruction for mathematics, about half in SLG and two-fifths in Gaeltacht schools were in classrooms where teachers identified the language of mathematics as the main obstacle to teaching exclusively through Irish (Table E6.5).

Other problems associated with teaching exclusively through Irish included: ensuring that pupils are adequately prepared to attend an English-speaking post-primary school; difficulty in accessing suitable resources in Irish; and pupils not having a sufficient standard in Irish, particularly with regard to problem solving.

It is interesting to note that although only half of Sixth class pupils were taught mathematics exclusively through Irish and despite the problems identified by teachers, 81% of Sixth class SLG pupils took the Irish version of the mathematics test (see Table 3.11, Chapter 3). As noted in Chapter 3, the mean score of these pupils was not significantly different to that of pupils who did the test in English. A lower percentage of Sixth class pupils in Gaeltacht schools (59%) took the test in Irish which may be associated with the more widespread concerns of teachers in Gaeltacht schools about pupils' proficiency in Irish (see Table 6.4). Again, no significant difference was found between the mean scores of Sixth class pupils in Gaeltacht schools who took the English version of the test and those who took the Irish one.

No significant differences were found in the mean mathematics scores of pupils at either Second or Sixth class who received instruction through Irish only and those who received instruction through a mix of Irish and English. However, we might expect that what would be important for mathematics achievement is that if a pupil took the test in English that they would have had at least some instruction in English; i.e. that pupils who did the test in English and received instruction in a mix of English and Irish would have a higher mean score than pupils who did the test in English but had received instruction exclusively through Irish. This issue will now be considered.

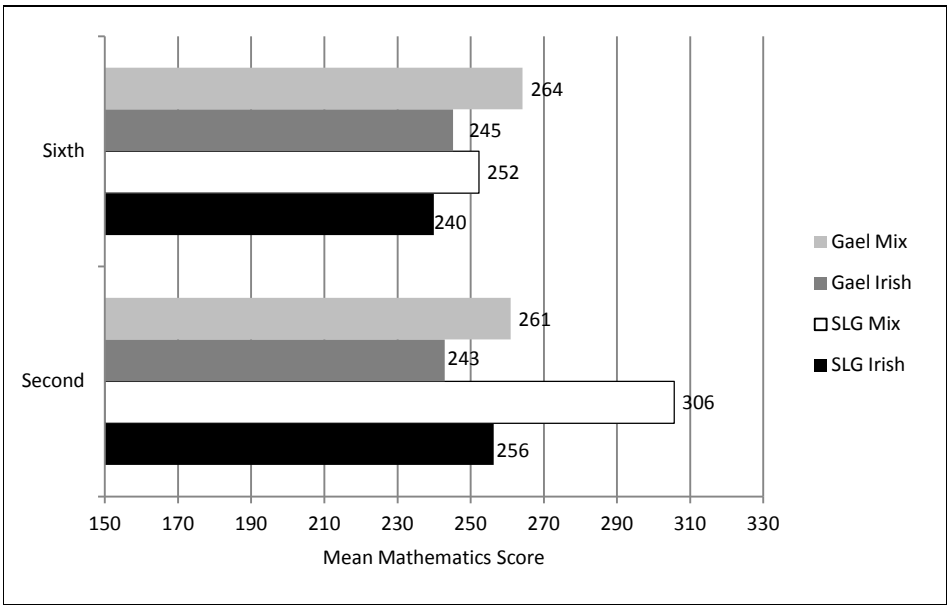
Table 6.5: Percentages of pupils who received mathematics instruction in Irish only or Irish and English, by language of test and school type

		SLG	Gaeltacht
Second	Instruction in Irish, test in English	6	3
	Instruction in Irish, test in Irish	77	43
	Instruction in English and Irish, test in Irish	14	6
	Instruction in English and Irish, test in English	4	48
Sixth	Instruction in Irish, test in English	2	5
	Instruction in Irish, test in Irish	51	45
	Instruction in English and Irish, test in Irish	29	16
	Instruction in English and Irish, test in English	17	34

Table 6.5 shows that it was rare for pupils to receive mathematics instruction exclusively through Irish and to do the test in English; just 2-6% of pupils across grade levels and school types were in this position. It was equally rare for Second class SLG pupils to do the test in English, having had instruction in both English and Irish – only 4% of pupils were in this category – but this was much more common in Gaeltacht schools, where 48% of Second class pupils were in this category. At Sixth class, 17% of SLG pupils and 34% in Gaeltacht schools had mathematics instruction in a mix of English and Irish and did the test in English.

Figure 6.1 shows the mean mathematics scores of pupils who did the test in English by language of instruction (recall that the percentage of SLG pupils at Second class who did the test in English is very low, Table 6.5 above). At Second class, pupils in both SLG and Gaeltacht schools who did the mathematics test in English achieved a significantly higher mean score when instruction took place in a mix of English and Irish, rather than exclusively through Irish; e.g. the mean score of Second class pupils in Gaeltacht schools who did the test in English and received instruction in English and Irish was 261 compared to a mean score of 243 for pupils who did the test in English and received instruction exclusively through Irish (e-App. Table E6.6). Given the low percentages of pupils who did the test in English and received instruction through Irish only, it is important not to overstate the importance of these findings. A similar pattern of results was evident at Sixth class, although differences were not statistically significant. Among pupils who did the test in Irish, there were no statistically significant differences between the mean scores of those who received instruction exclusively through Irish and those who received instruction through a mix of Irish and English.

Figure 6.1: Mean mathematics scores of pupils who did the mathematics test in English, by language of mathematics instruction, by class level and school type



Sixth class pupils were asked a number of questions about their use of translation when learning mathematics through Irish. Table 6.6 shows that translation from Irish to English was not a widely practiced strategy; e.g., just 25 to 30% of pupils who learned mathematics through a mix of Irish and English, and 18% of those who learned exclusively through Irish, indicated that they *often* or *always* translated from Irish to English. Lower percentages of pupils frequently asked the teacher or other pupils to translate. One-third to two-fifths of pupils indicated that the teacher *often* or *always* helped them with Irish terms if they had difficulty.

Table 6.6: Percentages of Sixth class pupils who often or always translate from Irish to English in mathematics, by language of mathematics instruction and school type

	SLG		Gaeltacht	
	Irish	Irish and English	Irish	Irish and English
I translate a word or mathematical term from Irish to English	18	30	18	25
I ask the teacher to translate mathematics terms from Irish to English	15	14	12	14
I ask other pupils in the class to translate mathematics terms from Irish to English	8	10	6	11
The teacher helps me if I have difficulty with mathematics terms in Irish	39	40	33	30

When pupils learned mathematics exclusively through Irish (as reported by their teacher), they were more likely to *agree* or *strongly agree* that they preferred to learn mathematics in Irish than in English (Table 6.7). Also, they were less likely to agree with the statement 'I would do better in Maths if I were learning it in English'. Fewer than one-in-three Sixth class pupils who learned mathematics exclusively through Irish *agreed* or *strongly agreed* with this statement. Thus, while teachers emphasised the complexity of mathematical vocabulary in Irish, there is no strong evidence that pupils felt that they would perform better if learning through English. (Note that about 20-35% of pupils in each school type, regardless of language of instruction, were 'not sure' about each of these statements. A detailed breakdown of the percentages is given in the e-App. Table A6.7).

Table 6.7: Percentages of Sixth class pupils who agreed or strongly agreed with various statements about learning mathematics through Irish, by language of instruction and school type

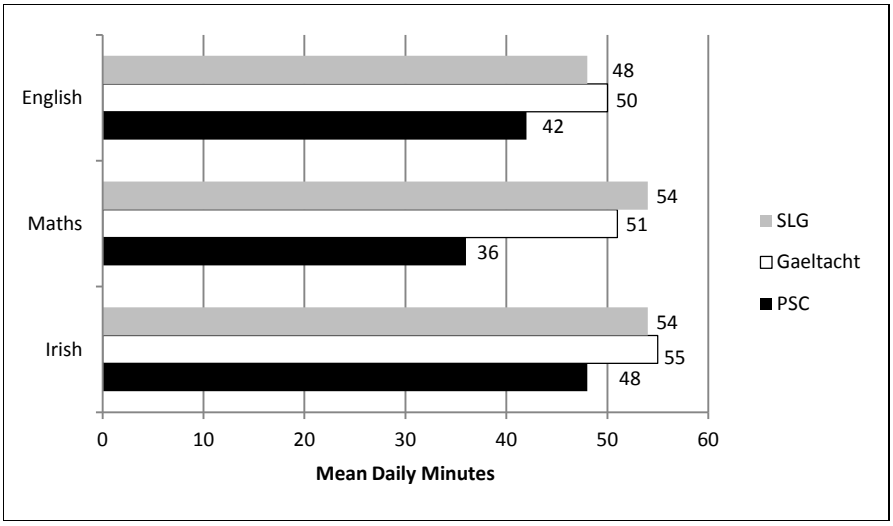
	SLG		Gaeltacht	
	Irish	Irish and English	Irish	Irish and English
I prefer to learn mathematics in Irish than in English	44	29	45	19
I would do better in Maths if I were learning it in English	28	38	30	52

Resources for Teaching and Learning

Time spent on English, Mathematics and Irish

According to the curriculum guidelines (DES/NCCA, 1999a), four hours per week should be spent on the main language of instruction (i.e., Irish in the case of Irish-medium schools), three and a half hours on the second language (i.e., English in the case of Irish-medium schools) and a minimum of three hours weekly should be devoted to teaching mathematics. Two hours per week of "discretionary time" can also be applied to these or other curriculum areas. Figure 6.2 shows that the average amount of time spent daily by Sixth class pupils on English, mathematics and Irish exceeded the minimum recommended time in both Gaeltacht schools and SLG. The difference was particularly pronounced for mathematics where Sixth class pupils spent on average one and a half times the recommended minimum time. Findings were similar in NA '09, where the average amount of time spent on mathematics daily by Sixth class pupils was 52 minutes and the average time spent on the main language of instruction (i.e. English) was 55 minutes.

Figure 6.2: Mean number of minutes per day allocated to the teaching of English, mathematics and Irish, as reported by Sixth class teachers, and minimum specified in the curriculum (PSC)



At Second class, SLG pupils spent an average of 54 minutes per day on Irish, 48 minutes per day on English and 46 minutes per day on mathematics (e-App. Table E6.7). In Gaeltacht schools, Second class pupils spent an average of 48 minutes per day on Irish, 43 on English and 42 on mathematics. The averages for English and mathematics in the National Assessments were 53 and 45 minutes respectively.

There was variation across classes in the amount of time spent on each of the three subjects. The standard deviation for weekly time spent on English by Sixth class pupils was 51 minutes in SLG and 50 in Gaeltacht schools; for mathematics, the figures were 71 and 73 respectively, and for Irish, 89 and 73 respectively (e-App. Table E6.8).

About one-tenth of Sixth class pupils in Gaeltacht schools and one-fifth in SLG were in classrooms where teachers reported spending less than the minimum recommended time on English each week; the corresponding figure in the National Assessments was 22% (Table 6.8). More than one-quarter of Sixth class pupils in SLG and 13% in Gaeltacht schools spent less than the minimum recommended time on Irish. Differences between the school types are not statistically significant. It was much less common for Sixth class pupils to spend less than the recommended time on mathematics; not more than 3% of Sixth class pupils were in classrooms where this occurred (Table 6.8).

Table 6.8: Percentages of Sixth class pupils whose teachers reported that they spent less than the minimum recommended time on English, mathematics and Irish, by school type

	SLG	Gaeltacht	NA '09
English[1]	20	11	22
Maths	2	3	1
Irish	29	13	– [2]

[1]In Irish-medium schools, English is the second language. Thus, the minimum recommended time is 3.5 hours per week. In English-medium schools, English is the first language. Thus, the minimum recommended weekly time is four hours.
[2]Not asked in NA '09.

Subject-Specific Resources

This section discusses materials used during the course of English and mathematics lessons, rather than during the planning of lessons which was discussed in Section 1 above. It draws on teacher responses to multiple-choice questions based on a list of seven materials for English and seven for mathematics. Teachers were asked to indicate whether they used each one *most days*, *once or twice a week*, *once or twice a month* or *rarely or never*.

Teachers in Irish-medium schools reported that published reading schemes were the most widely used resource in English lessons. About four-fifths of Second class pupils and three-fifths of Sixth class pupils in Irish-medium schools were in classrooms where teachers indicated that they used published reading schemes every day. Almost all pupils were in classrooms where they were used at least weekly (Table 6.9). Workbooks or worksheets were also widely used; again, almost all Second and Sixth class pupils in Irish-medium schools and in NA '09 were in classrooms where workbooks or worksheets were used at least weekly.

Table 6.9 also shows that there were few differences between the use of resources in English lessons in SLG, Gaeltacht schools and NA '09. Looking specifically at children's literature, it was reportedly used more frequently at Second class than at Sixth. It may be of concern that just half of Sixth class pupils in Irish-medium schools used children's literature at least weekly in English lessons. Interestingly, about two-fifths of Sixth class pupils used digital texts on a weekly basis.

Table 6.9: Percentages of pupils in schools whose teachers reported using specified materials in English lessons at least weekly, by class level and school type

	2nd class – At least weekly			6th class – At least weekly		
	SLG	Gael	NA '09	SLG	Gael	NA '09
Published reading schemes	92	98	92	92	98	84
Workbooks or worksheets	99	96	94	88	96	86
Children's literature (not part of reading schemes)	62	79	73	50	48	67
Digital texts (e.g. webpages)	31	31	25	42	39	36
Reference materials (e.g. encyclopaedia)	34	39	32	43	42	44
Informational texts	38	32	38	52	57	47
'Real-life' texts or documents (e.g. newspaper articles)	22	16	13	32	45	32

Table 6.10: Percentages of pupils whose teachers reported using specified materials[1] in mathematics lessons at least weekly, by class level and school type

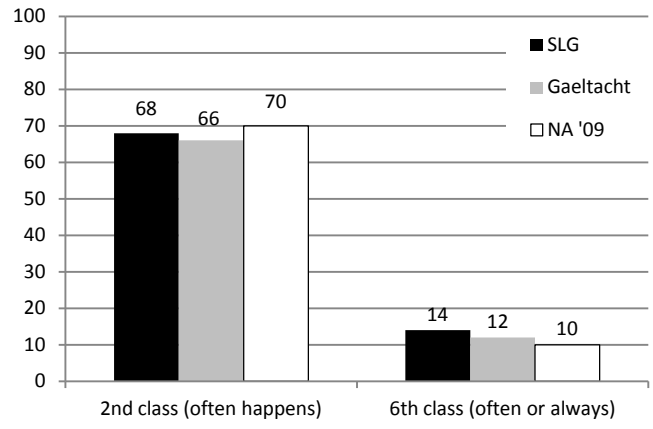
	2nd class			6th class		
	SLG	Gael	NA '09	SLG	Gael	NA '09
Textbooks	99	98	99	100	98	99
Workbooks / worksheets	95	98	96	80	82	86
Tablebooks	82	83	80	30	39	38
Real-life materials (e.g. timetable, weights)	78	62	60	36	54	43
Manipulatives (e.g. blocks)	74	77	68	15	11	10
Mathematics games	67	58	60	28	34	25

[1]Six of the seven mathematics resources are presented here. The seventh – calculators – are discussed in the section on technology.

Teachers at both grade levels were asked about the frequency with which they used different resources during mathematics lessons. At both Second and Sixth class and across all school types, the use of textbooks in mathematics lessons was very prevalent. A large majority of pupils used textbooks in *most or all lessons* and virtually all pupils used textbooks at least weekly (Table 6.10). Workbooks and worksheets were also very widely used, particularly at Second class. Tablebooks, real-life materials, manipulatives and mathematics games were widely used at Second class but less so at Sixth class. More than half of Sixth class pupils (63% in SLG and 58% in Gaeltacht schools) reported never using tablebooks in their mathematics lessons.

At both grade levels, pupils were asked about their use of equipment in mathematics classes. At Second class, pupils were asked whether or not they often used equipment, like weighing scales or measuring tapes, to solve problems. At Sixth class, pupils were asked how often they used this equipment, i.e. *never*, *sometimes*, *often* or *always*. Figure 6.3 shows that while mathematics equipment was widely used at Second class according to pupils' reports, it was much less frequently used at Sixth class.

Figure 6.3: Percentages of pupils who reported that they regularly use mathematics equipment to solve problems in mathematics class, by grade and school type



Use of materials in mathematics lessons

Teachers reported much more widespread use of real-life materials, manipulatives and mathematics games at Second class than at Sixth. Pupils too reported greater use of equipment at Second class than at Sixth. Textbooks and workbooks were the main materials used in mathematics lessons at Sixth class.

Technology

Teachers were asked to indicate on a four-point scale (ranging from *most or all lessons* to *rarely or never*) the frequency with which they used a digital projector, an interactive whiteboard (IWB) or a computer in teaching English, mathematics and Irish. Up to one-third of SLG pupils were in classrooms where a digital projector was used at least weekly for English (Table 6.11). Percentages were considerably lower in Gaeltacht schools and in NA '09. Over 60% of Sixth class pupils in Irish-medium schools were in classrooms where digital projectors were *rarely or never* used in English lessons.

Table 6.11: Percentages of pupils in schools where teachers indicated that various types of technology were used at least weekly in English, mathematics and Irish, by class level and school type

		2nd class – At least weekly			6th class – At least weekly		
		SLG	Gael	NA '09	SLG	Gael	NA '09
English	Digital Projector	26	17	8	32	13	15
	Computers	37	34	26	36	44	23
	Interactive whiteboard	51	34	20	56	43	28
Maths	Digital Projector	26	12	8	26	12	11
	Computers	47	35	24	15	31	14
	Interactive whiteboard	49	36	19	49	42	26
Irish	Digital Projector	23	17	[a]	29	12	[a]
	Computers	36	38	[a]	24	42	[a]
	Interactive whiteboard	47	35	[a]	50	42	[a]

[a]Not asked in NA '09

It is likely that the low usage of digital projectors relates to their lower availability (discussed in Chapter 5) compared to computers and IWBs, since when there was a digital projector in pupils' own classrooms, usage was higher. Table 6.12 shows the percentages of pupils in schools where digital projectors were available in their own classrooms and where the projector was used at least weekly.

Although teachers were asked to distinguish between the use of IWBs and digital projectors, it may be the case in practice that IWBs are used for the same purposes as a digital projector. At Sixth class, 65% of SLG pupils and 46% of Gaeltacht pupils used either a digital projector or an IWB (or both) at least once per week for English lessons. However, in the English lessons of one-fifth of SLG Sixth class pupils and one-third of Gaeltacht pupils, there was little use of technology; teachers reported *rarely or never* using the IWB 'and' *rarely or never* using a digital projector.

In contrast to digital projectors, IWBs were very widely used, particularly when available in pupils' own classrooms. Between 40 and 50% of all Sixth class pupils in Gaeltacht schools and SLG were in classrooms where the teacher reported using the IWB at least weekly (i.e. in *most or all lessons* or *once or twice per week*) for English, mathematics or Irish (Table 6.11). However, a sizeable minority of Sixth class pupils (30% in SLG and 46% in Gaeltacht schools) were in classrooms where teachers reported *rarely or never* using an IWB for English; of course, in some cases this may relate to the fact that no IWB was available (e-App., Table A6.11).

Table 6.12: Percentages of pupils in schools where teachers indicated that various types of technology were available in their own classrooms and used at least weekly in English, mathematics and Irish, by class level and school type

		2nd class – At least weekly			6th class – At least weekly		
		SLG	Gael	NA '09	SLG	Gael	NA '09
English	Digital Projector	61	49	32	67	36	44
	Computers	41	42	29	40	45	24
	Interactive whiteboard	94	78	84	84	78	89
Maths	Digital Projector	59	36	29	53	33	30
	Computers	52	43	27	17	32	15
	Interactive whiteboard	91	84	86	72	77	80
Irish	Digital Projector	52	51	[a]	59	33	[a]
	Computers	40	45	[a]	28	43	[a]
	Interactive whiteboard	85	83	[a]	74	76	[a]

[a]Not asked in NA '09

To account for classrooms where no IWB was available, Table 6.12 excludes pupils in classrooms with no IWB. When there was an IWB in the classroom, teachers of about 70-80% of Sixth class pupils and 80-90% of Second class pupils reported using the IWB at least weekly for English, mathematics or Irish lessons. When the IWB was located in a central room and not in the classroom, teachers reported much less frequent use of it in their lessons; e.g. among Sixth class SLG with an IWB in a central room only, about half were in classes where the teacher reported using the IWB *once or twice per month* and half were in classrooms where the teacher reported *rarely or never* using the IWB for English lessons.

When computers were available in pupils' classrooms, about two-fifths of pupils in Irish-medium schools used them at least weekly for English or Irish (Table 6.12). Percentages were somewhat lower for mathematics at Sixth class; e.g., similar to NA '09, only 17% of Sixth class SLG pupils used computers at least weekly in mathematics lessons (Table 6.12).

There was somewhat greater usage of computers for mathematics at Second class in Irish-medium schools than in NA '09 (the difference between SLG and NA '09 is statistically significant). Across all Second class pupils, and not only those with a computer in their classroom, 47% of pupils in SLG and 35% in Gaeltacht schools were reported to use computers at least once per week for mathematics compared to 24% in NA '09 (Table 6.11).

Sizeable percentages of Second and Sixth class pupils *rarely or never* used computers for mathematics, according to their teachers. In SLG, the figures were 36% at Second class and 45% at Sixth, while in Gaeltacht schools, 20% of Second class pupils and 23% of Sixth *rarely or never* used computers for mathematics (e-App. Table A6.11). In NA '09, 42% of Second class pupils and 30% of Sixth class pupils were in this category.

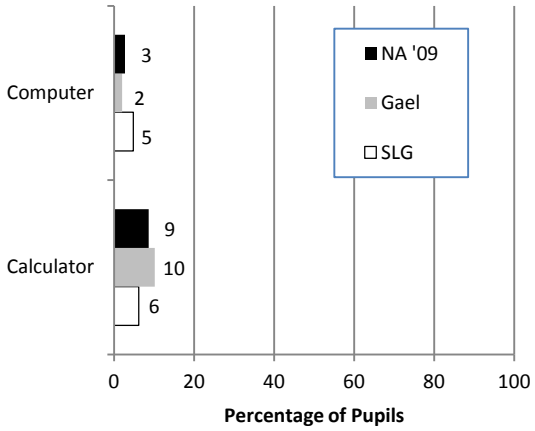
More detailed information was sought from teachers on the types of activities for which Sixth class pupils used computers in mathematics lessons (this was not asked at Second class). As in NA '09, it was more common for Sixth class pupils in Irish-medium schools to use computers at least weekly to 'practice mathematical facts and basic skills' and to 'learn mathematical concepts' than for 'non-routine problem solving' or to 'handle data' although, similar to NA '09, the percentages of pupils using computers on a weekly basis for each of these activities were low (Table 6.13). Figure 6.4 shows that pupils' reports concur with those of teachers, in so far as only a tiny minority of pupils reported using computers *often* or *always* in mathematics lessons.

Table 6.13: Percentages of Sixth class pupils whose teachers indicated that they used computers 'at least weekly' for various purposes, by school type

	SLG	Gael	NA '09
Practice mathematical facts and basic skills	14	24	22
Learn mathematical concepts	17	20	16
Engage in non-routine problem-solving or higher-level thinking	3	6	5
Handle data, e.g. graphs or tables	9	9	6

In the context of the frequency with which various materials were used in mathematics classes, teachers of Sixth class pupils were asked how often pupils used calculators. Pupils themselves were also asked about the frequency of using calculators in mathematics lessons. Only one-in-ten pupils reported that they *often* or *always* used calculators in mathematics lessons (Figure 6.4). Of course it is difficult to know how pupils interpreted the terms *often*, *always*, *sometimes* and *never* and while low percentages of pupils reported *often* or *always* using calculators, about 80% indicated that they use them *sometimes*. Roughly half of pupils were reported by teachers to use calculators at least weekly in mathematics (Table 6.14).

Figure 6.4: Percentages of Sixth class pupils who indicated that they used a computer or a calculator often or always in mathematics lessons, by school type



Calculators in the Mathematics Lesson

The Primary School Mathematics Curriculum (DES/NCCA, 1999d) advocates the use of calculators at Sixth class for calculations involving whole numbers and decimals, including in problem-solving contexts. One-eighth of Sixth class pupils in SLG, one-ninth in Gaeltacht schools and one-fifth in NA '09 reported that they never used calculators in mathematics lessons. Teachers' reports were similar: teachers of 15% of pupils in SLG, 9% in Gaeltacht schools and 22% in NA '09 indicated that they rarely or never used calculators in mathematics lessons.

Sixth class teachers were also asked a series of more detailed questions on the uses of calculators in mathematics lessons. Calculator usage was not found to be a key feature of tests or exams: only about one-quarter of pupils in NA '09 and two-fifths in Irish-medium schools *always* or *sometimes* used calculators in tests or exams (Table 6.14). In SLG, Gaeltacht schools and NA '09, calculators were most commonly used for checking answers; between half and two-thirds of all Sixth class pupils were reported to use calculators for this purpose on a weekly basis although it is unclear why in each of the school types, the percentages reported to use calculators on a weekly basis for checking answers are somewhat higher than the percentages using calculators overall (Table 6.14). In Irish-medium schools, one-third to one-half of pupils used calculators on a weekly basis for routine calculations, developing number concepts and/or for developing estimation skills.

Table 6.14: Percentages of Sixth class pupils whose teachers indicated that they used calculators with varying frequency and for various purposes, by school type

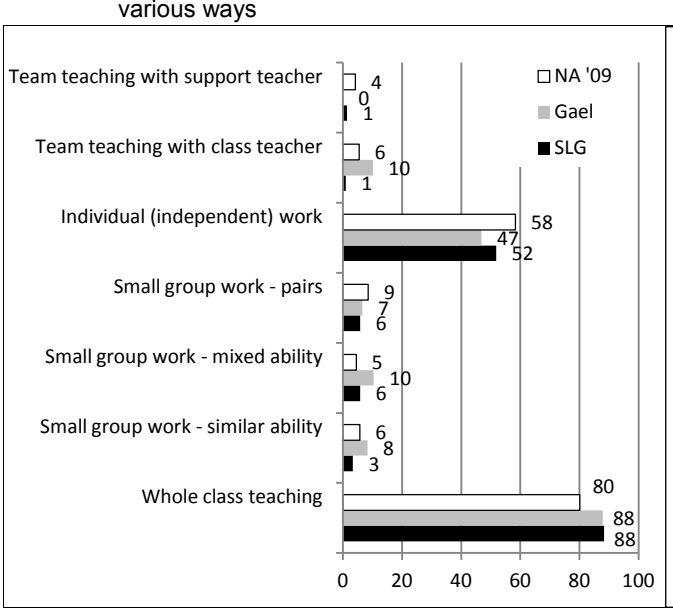
	SLG	Gael	NA '09
Use calculators at least weekly	49	53	43
Use calculators always or sometimes in tests and exams	39	42	28
Use calculators at least weekly for…[1]			
Checking answers	55	67	50
Routine calculations	40	52	35
Developing number concepts	40	49	21
Developing estimation skills	33	52	32

[1]It is not clear why a higher percentage of teachers indicated that pupils use calculators weekly for checking answers than used calculators generally.

Grouping

Teachers were asked about the organisation of their English and mathematics lessons and the grouping practices they employed. With reference to the target grade only (i.e. teachers of multigrade classes were advised to refer only to the class participating in NAIMS), teachers were asked whether they organised their classes in specified ways for *most lessons*, *some lessons* or *never*. Figure 6.5 shows that whole class teaching and individual work were the most common forms of organising Sixth class English lessons.

Figure 6.5: Percentages of Sixth class pupils whose teachers reported organising most English lessons in various ways



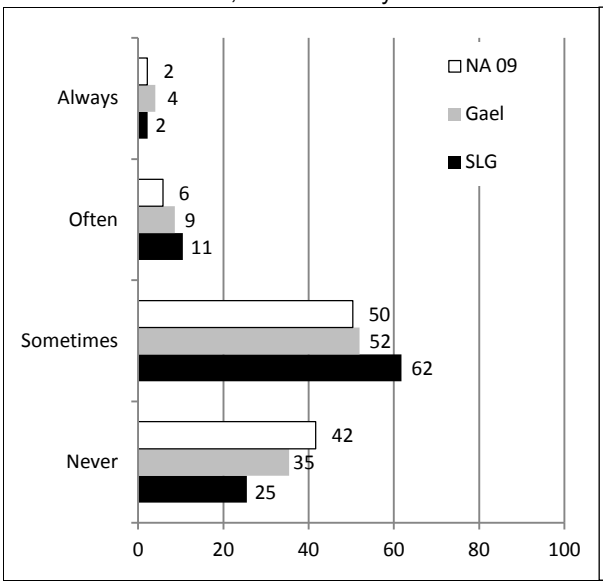
Grouping practices by subject and grade

At least 80% of Sixth class pupils were in classes where teachers indicated that they used whole class teaching in most English lessons. A very similar picture was evident in the teaching of Sixth class mathematics – about 85% of pupils were in classes where whole class teaching was used for most lessons.

English lessons at Second class also tended to be organised around whole class teaching and individual work. As in NA '09, there was somewhat greater usage of small group work in English lessons at Second class than at Sixth.

Turning to pupils' reports on the organisation of mathematics lessons, Figure 6.6 shows the percentages of Sixth class pupils who indicated that they *always*, *often*, *sometimes* or *never* worked in pairs or small groups. In line with teachers' reports on grouping in English lessons shown in Figure 6.5, pupils reported infrequent use of group work in mathematics.

Figure 6.6: Percentages of Sixth class pupils who indicated that they work in pairs or small groups never, sometimes, often or always in mathematics classes, by school type



Second class pupils and group work in mathematics

At *Second* class, pupils were asked about their *preferences for group work* and individual work in mathematics classes. About half of Second class pupils in SLG (54%), Gaeltacht schools (57%) and NA '09 (46%) agreed with the statement 'In maths class, I prefer to work in a group or pair'.

Higher percentages of Second class pupils agreed with the statement 'In maths class, I prefer to work by myself', ranging from 67% of pupils in Gaeltacht schools to 75% in SLG. The corresponding percentage in NA '09 was 73%.

Teachers of multigrade classes were asked to indicate whether they grouped pupils from different class levels for English or mathematics. Teachers of about 30% of Sixth class pupils in multigrade classes in SLG and Gaeltacht schools indicated that they always grouped their Second class pupils with other classes for English while teachers of about 10% reported that they never did (e-App. Table E6.9). Grouping Sixth class pupils with pupils from other classes was less common for mathematics. Just 12% of pupils in multigrade classes were always grouped with pupils from other classes for mathematics. Grouping Second class pupils with pupils from other classes

was also comparatively rare: just 4% of Second class pupils in multigrade classes in Gaeltacht schools were always grouped with pupils from other classes for mathematics and 10% of Second class pupils in Gaeltacht schools were always grouped for reading.

Methodologies

English lessons

Teachers were asked to indicate on a four-point scale ranging from *every day* to *rarely or never* how often pupils in the target grade read books of their own choosing during English classes. At Sixth class, according to teachers' reports, half of pupils in SLG and two-thirds in Gaeltacht schools read books of their own choosing every day or most days (e-App. Table E6.10). Teachers were also asked about whether or not in the month prior to the assessment they had encouraged pupils to engage in paired or shared reading with their parents, discuss with their parents a book that the pupil had read, visit a public library or read a book for enjoyment. High percentages of Sixth class pupils were in classrooms where teachers indicated that they had encouraged pupils to read a book for enjoyment and to visit a public library; i.e. all Sixth class pupils were in classrooms where the teacher indicated that he/she had encouraged them to read a book for enjoyment and over 60% were in classrooms where the teacher had encouraged them to visit a public library (e-App. Table E6.10). As might be expected, it was much more common for pupils in Second class to be encouraged to engage in shared or paired reading with parents. Over 85% of Second class pupils in SLG and Gaeltacht schools had been encouraged to do this compared with about 30% of Sixth class pupils. Higher percentages of Second class pupils (86% in SLG and 67% in Gaeltacht schools) than Sixth class (57% in SLG and 58% in Gaeltacht schools) were in classrooms where the teacher had encouraged them to discuss a book with their parents.

Teachers of Sixth class pupils were asked how often they engaged their pupils in various writing activities. Almost all Sixth class pupils were in classes where writing in response to reading took place at least once or twice a week (Table 6.15). Creative writing and expository writing were also widely practiced. It was comparatively less common for pupils to read other pupils' writing on a frequent basis or to write for projects in other subjects.

Table 6.15: Percentages of Sixth class pupils whose teachers indicated that they provided at least weekly instruction on specific writing skills in English class, by school type

	SLG	Gael	NA '09
Writing in response to reading	91	98	87
Creative writing	77	63	65
Expository (informational) writing	54	72	57
Reading other pupils' writing	29	49	38
Writing for projects in other subjects	15	39	[a]

[a]Not asked in NA '09

Second class teachers were asked about the frequency with which they provided instruction in various aspects of reading. Almost all Second class pupils, whether in SLG, Gaeltacht schools or NA '09, were in classrooms where each of the areas was covered at least weekly, including oral reading/fluency and comprehension strategies (Table 6.16).

Table 6.16: Percentages of Second class pupils whose teachers indicated that they provided at least weekly instruction on specific skills in English class, by school type

	SLG	Gael	NA '09
Phonemic awareness	92	97	88
Phonics	98	97	93
Word attack skills	93	91	90
Silent reading	81	84	92
Oral reading/fluency	98	98	99
Comprehension strategies	94	98	94

Second class pupils only were presented with a list of five activities and asked which ones they *often* got for homework. Almost all pupils indicated that they were often required to learn English spellings and to read a book (Table 6.17). Half to two-thirds of pupils were often required to answer questions in their English workbook or to write a story in English. It was comparatively less common for pupils to be required to use a computer for homework: about one-in-six Second class pupils indicated that they often did this.

Table 6.17: Percentages of Second class pupils who reported often having to do specific tasks for English homework, by school type

	SLG	Gael	NA '09
Learn English spellings	98	97	97
Read a book	95	96	94
Answer questions in your English workbook	59	61	66
Write a story in English	43	53	50
Use a computer	19	16	16

Mathematics lessons

Pupils were asked about the materials they used in mathematics classes and the types of activities which took place. Some limited comparisons can be drawn between Second and Sixth class, since although some of the same items were presented at both grades, the response options were different. At Second class, pupils were asked to indicate *yes* or *no* in respect of whether each of several activities took place in mathematics class. At Sixth class, pupils were asked to indicate the frequency with which activities happened using the scale *never*, *sometimes*, *often* or *always*.

Table 6.18: Percentages of pupils who reported doing various activities in mathematics lessons, by class level and school type

	2nd class (Activity often happens)			6th class (Activity happens often or always)		
	SLG	Gael	NA '09	SLG	Gael	NA '09
We talk about a maths problem before doing it on our own	86	87	86	73	57	69
I do a sum on the board in front of the class	83	68	63	9	9	11
I explain to the teacher how I got the answer to a question	[a]	[a]	[a]	54	43	52
I estimate (guess) the answer to a sum before doing it	[a]	[a]	[a]	10	13	17
I begin my homework in class	[a]	[a]	[a]	7	9	9
I explain to the class how I got the answer to a question	69	46	59	[a]	[a]	[a]
The teacher checks my homework	89	87	95	[a]	[a]	[a]
We check each other's homework	24	19	23	[a]	[a]	[a]

[a]Not asked at this grade level

A majority of pupils at both grade levels and across school types indicated that they often talked about a mathematics problem before doing it alone (Table 6.18), although this was somewhat more common at Second class than at Sixth. Doing sums on the board in front of the class was much more common at Second class than at Sixth. At least half of pupils at Second class indicated that they often explained to the class how they had got the answer to a question. At Sixth class, roughly half of pupils indicated that they often explained to the teacher how they got the answer to a question. Low percentages of pupils at Sixth class indicated that they often or always estimated the answer to a sum before doing it or that they began their homework in class on a regular basis. These items were not asked at Second class. About one-quarter of Second class pupils indicated that they often checked each other's homework; this item was not asked at Sixth class.

Non-standardised Assessments

The use of standardised assessments in English, mathematics and Irish was discussed in Chapter 5. This section examines teachers' use of non-standardised assessment measures. Teachers were presented with a list of various forms of non-standardised assessment and asked to indicate, for each subject, whether they used that form of assessment *at least once per week*, *at least once per month*, *once per term*, *once or twice per year* or *never*.

At both Second and Sixth class in each of the school types and across the three subject areas, teacher questioning was very widely used as a method of assessing pupils' progress (Sixth class given in Table 6.19, Second class in e-App. Table E6.11). Almost all pupils were in classrooms where teachers reported using this method of assessment either *at least once or twice per week* or *at least monthly*. Other methods of assessment which were reported to be used at least monthly by teachers of substantial percentages of pupils were error analysis, pupil self-assessment, teacher-made tests, teacher-made checklists and documented observations. Error analysis was reportedly used more frequently in the assessment of English reading at both Second and Sixth class than in the assessment of mathematics or Irish. Less common forms of assessment were reflective portfolios, published progress tests or checklists and curriculum profiles. Not surprisingly, given the purpose of diagnostic tests, low percentages of pupils were in classrooms where teachers reported using these *at least monthly*.

Table 6.19: Percentages of Sixth class pupils assessed 'at least monthly' in English reading, mathematics and Irish, using various non-standardised assessment measures

	English reading			Maths			Irish[a]	
	SLG	Gael	NA '09	SLG	Gael	NA '09	SLG	Gael
Teacher questioning	100	97	96	89	95	97	96	100
Error analysis	78	79	[a]	52	50	64	46	59
Pupil self-assessment	46	51	37	[b]	[b]	[a]	39	50
Teacher-made tests	45	78	59	70	85	79	73	76
Teacher-made checklists	43	58	48	50	64	52	53	69
Documented observations	37	52	48	67	66	47	71	72
Reflective journals	14	15	17	6	8	8	10	16
Portfolios	13	22	16	9	20	11	13	20
Published progress tests or checklists	7	22	15	20	20	18	8	15
Curriculum profiles	5	5	13	1	7	7	7	13
Diagnostic tests	1	5	9	5	13	7	[b]	[b]

[a]Not asked in NA '09
[b]Not asked in NAIMS

Sixth class pupils were asked to indicate, on a four-point scale ranging from *never* to *always*, how often they did a test as part of their mathematics lessons. Just 5% of Sixth class pupils in SLG and Gaeltacht schools and 3% in NA '09 reported never doing a test while about half of Sixth class pupils reported doing a mathematics test *often* or *always* (SLG 48%; Gaeltacht 56%; NA '09 55%) (e-App. Table E6.12). A large majority of Second class pupils (SLG 85%; Gaeltacht 88%; NA '09 91%) indicated that they often did a test but it is important to note that the question at Second class required a *yes/no* answer rather than the four-point scale used at Sixth class.

Key Points

- Teachers reported widespread use of textbooks in the planning of English and mathematics lessons. Textbooks were used to a much greater extent than other resources in the planning of mathematics lessons.
- Real-life materials were less frequently used for planning mathematics lessons at Sixth class compared to Second class. In addition, both teachers and pupils reported less frequent use of real-life materials and mathematics equipment in the course of mathematics lessons at Sixth class.
- Over 80% of Second class pupils in Scoileanna Lán-Ghaeilge (SLG) were taught mathematics through Irish only whereas at Sixth class, only half of pupils were taught using Irish only. In Gaeltacht schools, about half of pupils at each grade level were taught mathematics exclusively through Irish while half were taught using a mix of English and Irish. No pupils in Irish-medium schools were taught mathematics through English only.

- A reason commonly given by Sixth class teachers in SLG for not teaching mathematics exclusively through Irish was that many pupils would go on to a post-primary school where English was the language of instruction. The most commonly cited reason for using a mix of English and Irish in Gaeltacht schools related to pupils having an insufficient level of Irish to learn mathematics exclusively through the language.
- The main problem identified by teachers who taught mathematics through Irish only related to the complexity of mathematical vocabulary.
- Although the Primary School Curriculum advocates spending more time on the main language of instruction than on mathematics, on average, teachers in Irish-medium schools reported spending similar amounts of time on the two. Findings were similar in NA '09. About one-fifth of pupils in SLG and one-tenth in Gaeltacht schools spend less than the minimum recommended weekly time on English.
- Teachers indicated that they made more frequent use of technology, in particular interactive whiteboards and digital projectors, when it was available in their own classrooms rather than in a central room. Even when computers were available in the classroom, at most half of pupils used them on a weekly basis for the learning of English, mathematics or Irish.
- About half of Sixth class pupils were in classrooms where teachers reported at least weekly use of calculators in mathematics lessons. A substantial minority of Sixth class pupils (15% in SLG, 9% in Gaeltacht schools and 22% in NA '09) were in classrooms where teachers reported that calculators were rarely or never used.
- In English and mathematics lessons, whole class teaching and individual work predominated at both Second and Sixth class. Much less frequent use was made of team teaching or small group work. Pupils' lack of experience of small group work may partially account for the finding that two-thirds to three-quarters of Second class pupils indicated that in mathematics classes, they prefer to work by themselves.
- Teacher questioning was reported to be the most widely used method of assessment for English reading, mathematics and Irish. Error analysis was also quite widely used in the assessment of English reading (about 80% of Sixth class pupils were in classrooms where it was used at least monthly) but somewhat less so in the assessment of mathematics and Irish. About half of Sixth class pupils were in classrooms where pupil self-assessment was used at least monthly for the assessment of English reading and Irish. Less frequent use was made of other forms of assessment such as reflective journals, portfolios, published progress tests or checklists, curriculum profiles or diagnostic tests.

Chapter 7
Understanding Performance

In earlier chapters, some bivariate analyses were presented on associations between pupil achievement in reading and mathematics and school or family characteristics. In this chapter, we take a closer look at the associations between achievement and pupil and school characteristics, in the context of multi-level models of achievement.

The chapter is divided into five sections. The first section presents estimates of between-school variance in socioeconomic status (SES) by school type. Data are provided for Second and Sixth class pupils. The percentage of variance which is between schools gives an indication of the extent to which schools differ in terms of their socioeconomic intake. Section two examines the relationship between school-average SES and school-average achievement at Sixth class. The main focus of much of the report thus far has been on Sixth class so in order to redress the balance between the grades, the remainder of this chapter focuses primarily on Second class. Section three provides estimates of between-school variance in achievement at Second class, by school type (i.e. SLG, Gaeltacht and NA '09) and by domain (i.e. reading and mathematics). A multilevel model of reading achievement at Second class in Scoileanna Lán-Ghaeilge (SLG) is presented in section four. A multilevel model allows us to examine the association between achievement and various pupil and school characteristics simultaneously, while taking into account the clustering of pupils within schools (further details are provided on this technique in section four). It is of particular interest to look at the characteristics associated with reading achievement at Second class as it is temporally closer than Sixth class to the commencement of reading instruction. Time constraints prevented the construction of a separate model for Gaeltacht schools though future work at the ERC will look at this. The final section summarises some key findings from this chapter.

The statistical procedures used in this chapter are somewhat more complex than those used in earlier chapters. Insofar as possible, we have tried to keep technical information about these procedures separate from the main text in order to facilitate readers who are not interested in such detail. Furthermore, section five of the chapter provides a non-technical overview of key points from the chapter. With the more technical reader in mind, we provide appendix data for this chapter at the end of the report (rather than in a separate e-Appendix, as for earlier chapters).

Between-school Variance in Pupil Socioeconomic Status

In general, there are greater similarities between the family backgrounds and achievements of pupils within schools than between pupils from different schools. Goldstein (2003, p. 1) notes that

> once groupings are established, even if their establishment is effectively random, they will tend to become differentiated, and this differentiation implies that the group and its members both influence and are influenced by group membership.

Education systems are typically considered more equitable if differences between schools are small; i.e. low between-school variance indicates that schools are fairly homogenous in terms of achievement (though there may still be variation between pupils within schools). At post-primary level two recent international surveys have shown higher between-school variance in achievement in Ireland than in countries such as Finland and Norway but lower between-school variance in achievement than in Germany and Belgium (see e.g., Cosgrove, Gilleece & Shiel, 2011; OECD, 2010; Perkins et al., 2012). To date, little work has been done in Ireland examining the extent to which there is variation in pupil SES across schools. This section presents estimates of between-school variance in pupil SES. Of course, NAIMS was not designed to study variation in SES across schools; thus this section is exploratory in nature. In section three below on between-school variance in achievement, there is some discussion of three-level versus two-level decomposition of variance.

The *total variance* gives an estimate of the amount of variation which exists in the outcome of interest (e.g. pupil achievement or pupil SES). *Between-school variance* is an indicator of the extent to which differences in the outcome measure are attributable to differences between schools, rather than to differences between pupils within schools.

Table 7.1 presents estimates of the between- and within-school variation in pupil SES at Second class in SLG, Gaeltacht schools and in NA '09 (see Table 7.2 for Sixth class data). Looking at the amount of variation in SES which is between schools (rather than within), we see that at Second class, the amount of variance which is between schools is very similar in all three school types, with estimates ranging from 12% (SLG) to 15% (NA '09, Table 7.1). This means that, at Second class, all three school types are broadly similar in the homogeneity of their pupils' socioeconomic backgrounds.

Table 7.1: Estimates of between- and within-school variance in SES (unweighted) – Second class, by school type[1]

	SLG[2]		Gaeltacht[2]		NA '09[2]	
	Variance (SE)	% of Total	Variance (SE)	% of Total	Variance (SE)	% of Total
Between-school	29.0 (7.48)	12.3	34.9 (12.35)	13.1	37.4 (5.88)	15.0
Within-school	206.4 (7.73)	87.7	232.1 (15.52)	86.9	211.5 (5.40)	85.0
Total variance	235.4	100.0	232.1	100.0	248.9	100.0

[1]Estimated in SPSS using Variance Components, unweighted. Method=Maximum Likelihood. Values are equivalent to at least one decimal place to those computed in HLM.

[2]Based on Second class pupils who completed the Reading test

At Sixth class, there is somewhat less between-school variation across SLG and Gaeltacht schools (10% and 7%, respectively) than across schools in NA '09 (18%, Table 7.2). Lower between-school variance in SES in Irish-medium schools indicates that schools differ to a lesser extent in this regard than NA '09 schools. However, we need to keep in mind that the standard errors associated with the variance components are quite large; thus, any differences are unlikely to be statistically significant.

Table 7.2: Estimates of between- and within-school variance in SES (unweighted) – Sixth class, by school type[1]

	SLG[2]		Gaeltacht[2]		NA '09[2]	
	Variance (SE)	% of Total	Variance (SE)	% of Total	Variance (SE)	% of Total
Between-school	22.7 (6.33)	9.7	17.1 (7.66)	6.6	48.0 (7.48)	18.2
Within-school	212.6 (8.73)	90.3	243.1 (15.94)	93.4	216.2 (5.54)	81.8
Total variance	235.4	100.0	260.18	100.0	264.2	100.0

[1]Estimated in SPSS using Variance Components, unweighted. Method=Maximum Likelihood. Values are equivalent to at least one decimal place to those computed in HLM.

[2]Based on Sixth class pupils who completed the Reading test

Having looked at data from both grade levels, and taking into account the standard errors, Irish-medium schools and NA '09 schools appear broadly similar in terms of the total variance in pupil SES and also the percentage of variance in pupil SES which is between schools.

Average Socioeconomic Status and Average Achievement at Sixth Class

We begin this section by summarising the analyses presented earlier in the report on pupil and school SES. The new analyses in this section focus primarily on NA '09 and SLG rather than Gaeltacht schools as Gaeltacht schools had smaller average enrolment sizes, and, in small schools, there is a higher chance of results for a small number of atypical pupils skewing school-average data.

In Chapter 4, we examined the average SES across pupils and noted that the average SES of pupils in SLG was significantly higher than that of pupils in Gaeltacht schools and in NA '09. We also considered how a pupil's family SES related to his/her achievement in reading and mathematics. At both Second and Sixth class, and in SLG, Gaeltacht schools and NA '09, pupils from high SES families achieved significantly higher mean reading scores than pupils from low SES families. Similarly, at both grade levels, NA '09 and SLG pupils from high SES families achieved significantly higher mean scores in mathematics than pupils from low SES families. The difference between the mean mathematics scores of high SES and low SES Gaeltacht pupils was statistically significant at Sixth class only.

In Chapter 5, we looked at school average SES, i.e. the average socioeconomic status across all pupils within a school. Findings indicated that the average school-level SES in SLG was significantly higher than in Gaeltacht schools and in NA '09. We also investigated the association between individual pupil achievement and school participation in the School Support Programme (SSP) under DEIS. Second and Sixth class pupils attending SLG that were part of the SSP had statistically significantly lower mean scores in reading and mathematics than their counterparts who attended SLG that were not part of the SSP. There was a less robust association between participation in the SSP and achievement in the Gaeltacht schools. The only difference which was statistically significant was in favour of pupils in non-SSP Gaeltacht schools in reading at Second class.

In the first section of this chapter, we examined the variance in pupil SES and found few differences between the school types, particularly at Second class. The current section looks at the relationship between school average SES and school-

average achievement at Sixth class[39] in schools where at least 15 pupils completed a test. A technique called linear regression was used (see Box 7.1).

Box 7.1: Some details about regression analysis

Earlier chapters referred to the differences in achievement between SLG and NA '09. We wanted to explore whether or not these differences might be partly attributable to the differing SES profiles of the two school types.

Linear regression was used to examine how much school average achievement in NA '09 changed in association with school-average SES; i.e. given a one-point change in average SES, what was the corresponding change in school average achievement. Looking at the formula below, our main interest is in the parameter estimate associated with average SES. If this is large, changes in average SES are associated with substantial changes in achievement.

Expected reading score = Intercept + (Parameter estimate * average SES).

Using the parameter estimate from the regression equation calculated for NA '09 and assuming that the relationship between school-average SES and school-average achievement was the same in SLG as in NA '09, we predicted the *expected* achievement in SLG, given the *observed* average SES. We then looked at the gap between the *observed* SLG mean and the *observed* NA '09 mean and compared it to the gap between the *expected* SLG mean and the *observed* NA '09 mean. We were interested in the difference between these two gaps, given the known difference in average SES between the two school types. Expressing this as a series of formulae, we examined:

Actual gap in mean achievement between NA '09 and SLG = Observed SLG mean – observed NA '09 mean

Expected gap in achievement given mean SES = Predicted mean achievement in SLG – observed mean achievement in NA '09

Is actual gap – expected gap ≈ 0?

- In these analyses, only schools where at least 15 Sixth class pupils had completed a test were included; this is to reduce the likelihood of a small number of pupils skewing a school's results. A cut-off of fifteen was used as this was the level used by Eivers et al. (2010a). The following percentages of schools had at least 15 Sixth class pupils who completed the Reading test: SLG 71%; Gaeltacht 11%; NA '09 40%. For mathematics, the percentages were 71%, 11% and 39%, respectively.
- The regression analyses described here were conducted for SLG only and not for Gaeltacht schools as only one in ten Gaeltacht schools had 15 or more completed Sixth class tests.
- This analysis is based on a small subset of SLG and NA '09 schools (i.e. those where at least 15 pupils completed the relevant assessment) and is therefore exploratory in nature. The multilevel model presented later in this chapter includes all SLG as multilevel modelling allows larger estimates of uncertainty to be incorporated for smaller schools. This reduces the large-sample bias associated with the current section.
- As with all statistical estimates, parameter estimates from a regression have error associated with them. The range in which the true value lies can be calculated with a 95% confidence level by taking 1.96 times the standard error above and below the parameter estimate.
- The R-squared value is often reported in regression analyses. It measures of the proportion of variance in the dependent variable that is explained by the predictor variable(s). Values range from zero to one.

Before presenting findings from the regression analysis, Table 7.3 provides some descriptive statistics for school-average SES and school-average Sixth class reading achievement in each of the school types for schools where at least 15 Sixth class pupils completed the reading test. The SES figures presented here differ from those presented in Chapter 5 for two reasons. Firstly, only schools where at least fifteen Sixth class pupils completed the reading test are included here. Secondly, Table 7.3 refers to the average across schools rather than the average across pupils. In NA '09 schools where at least 15 Sixth class pupils completed the reading test, there was a statistically significant strong positive correlation between school-average SES and school average Sixth class reading

[39] Data are weighted by a normalised school weight.

achievement (r=.79).[40] Similarly, in SLG where at least 15 Sixth class pupils completed the reading test, there was a statistically significant positive correlation (r=.59) between school average SES and school-average Sixth class reading achievement.

Table 7.3: Mean and standard deviation of school-level SES and school-level reading achievement, Sixth class (schools with at least 15 completed reading tests[1])

	SLG		Gaeltacht		NA ''09	
	Mean (SE)	SD	Mean (SE)	SD	Mean (SE)	SD
School average SES[1]	54.0 (0.86)	5.79	48.7 (1.92)	6.85	48.3 (0.70)	7.23
School average 6th class reading achievement	265.2 (2.30)	15.39	256.0 (3.90)	13.81	249.0 (2.06)	23.00

[1]The percentages of schools with at least 15 completed reading tests were as follows: SLG 71%; Gaeltacht 11%; and NA '09 40%.

Using school average Sixth class reading achievement in NA '09 as a dependent (outcome) variable, the regression equation indicated that on average in schools with at least 15 completed Sixth class reading tests, a one-point increase in school-average SES was associated with a 2.5 point increase in school-average Sixth class reading achievement (see Appendix to Chapter 7, Table A7.1).[41] Using this information from NA '09 and turning to SLG, we calculated the *expected* gap between average reading achievement in NA '09 and average reading achievement in SLG, based on average school-level SES.

The expected gap in average reading achievement between NA '09 and SLG was about 14 points. This was calculated as follows: the average school-level SES in selected SLG (i.e. those with at least 15 completed Sixth class tests) was 5.7 points higher than in NA '09 (Table 7.3). The size of the difference in SES between the school types (5.7) was multiplied by the parameter estimate from the regression equation (2.5), giving a value of about 14. Therefore, the regression output predicts that the *expected* average reading achievement in SLG should be about 14 points higher than on average across NA '09 schools. Actually, the *observed* gap is about 16 points (Table 7.3). Thus, the average reading achievement in SLG is about what would be expected, given the average socioeconomic status of these schools.

A similar analysis was conducted to examine the association between school average mathematics achievement and school average SES. Again, descriptive statistics are provided before turning to the regression output. Table 7.4 provides the means, standard errors and standard deviations for school average SES and school average Sixth class mathematics achievement in SLG, Gaeltacht schools and NA '09 schools where at least 15 Sixth class pupils completed the mathematics test. It is of interest to note that in NA '09, there was a correlation of .65 between school average mathematics achievement and school average SES[42] in schools with at least fifteen

[40] Eivers et al. (2010a) reported a correlation of r=.83 between school-average reading achievement and school-average enrolment composition. The enrolment composition measure incorporated school-average SES, school SSP (DEIS) score, percentage of pupils from lone parent families and percentage of pupils from the Traveller community. School-average SES is used here rather than enrolment composition as there are few pupils from the Traveller community in Irish-medium schools. Furthermore, despite being the most up-to-date information available, SSP scores were computed in 2005 and may now be less accurate measures of current levels of disadvantage.
[41] Regression analyses were conducted in WesVar v5.1. Note that the standard error associated with the parameter estimate for school-average SES is 0.24.
[42] Eivers et al. (2010a) reported a correlation of .77 between average enrolment composition and school-average mathematics achievement. As noted above, the enrolment composition measure included school-average SES as

completed Sixth class mathematics tests. The corresponding correlation in SLG with at least fifteen completed Sixth class mathematics tests was .40.

Table 7.4: Mean and standard deviation of school-level SES and school-level mathematics achievement, Sixth class (schools with at least 15 completed mathematics tests)

	SLG		Gaeltacht		NA '09	
	Mean (SE)	SD	Mean (SE)	SD	Mean (SE)	SD
School-average SES[4]	54.1 (0.85)	5.85	48.7 (1.92)	6.84	48.4 (0.71)	7.23
School-average 6th class mathematics achievement	251.8 (3.32)	20.82	250.9 (6.42)	22.40	248.8 (2.65)	26.24

[4]Values differ slightly from those presented in Table 7.3 as values here were computed on the basis of all pupils who did the mathematics test whereas Table 7.3 relates to the reading test.

Using the NA '09 data, a linear regression (see Appendix to Chapter 7, Table A7.2) indicates that on average, a one point increase in school-average SES corresponded to a 2.4 point increase in school-average mathematics achievement. Again, this parameter estimate was used to calculate the *expected* gap between the average mathematics score in NA '09 and in SLG.

The *expected* gap between NA '09 and SLG was 14 points, calculated as follows: school-average SES in SLG was 5.7 points higher than in NA '09 (Table 7.4). This value was multiplied by the parameter estimate (2.4) from the regression equation (5.7 * 2.4). Actually, the *observed* average mathematics achievement of SLG is just 3 points higher than the average in NA '09 (Table 7.4). Thus, the *observed* gap (3 points) between SLG and NA '09 is much smaller than the *expected* gap (14 points). It is relevant to note at this point that SES is a less effective predictor of school-average mathematics achievement than of school-average reading achievement.

In NA '09, school average SES explained a greater proportion of the variation in average reading achievement (R^2=.62) than in average mathematics achievement (R^2=.42). Thus, school-average SES is a better predictor of school-average reading achievement than school-average mathematics achievement.

Our initial analyses suggest that the higher average reading score of SLG compared to NA '09 might be partly attributable to the higher average SES in these schools. In order to examine this further, we selected NA '09 schools which had similar average SES to SLG and which were not located in rural areas (as most SLG were not located in rural areas); we will term these 'comparison schools'. NA '09 schools were selected if they had 15 or more completed Sixth class tests, average SES which was at or above the minimum value found among SLG (43.8) and were not located in a rural area. Just 20% (N=27) of NA '09 schools were in this category and thus suitable for this comparative exercise.

The average school-level SES of NA '09 comparison schools was 52.1 compared to an average of 54.0 in SLG (Table 7.5), a difference which is not statistically significant (see Appendix to Chapter 7, Table A7.3), so it seems reasonable to consider these schools broadly comparable in terms of SES. Based on the regression equation (Appendix to Chapter 7, Table A7.1), the *expected* average reading score of the

well as school SSP (DEIS) score, percentage of pupils from lone parent families, and percentage of pupils from the Traveller community.

NA '09 comparison schools is 258.5.[43] The *expected* mathematics score is 259.9.[44] Thus the predicted score for reading is very similar to the *observed* score, while the predicted score for mathematics is about 6 points higher than the *observed* score (Table 7.5).

Table 7.5: Mean and standard deviation of school average SES, school average Sixth class reading achievement and school average Sixth class mathematics achievement, by school type[1]

	SLG			NA '09[2]		
	Observed		Expected	Observed		Expected
	Mean (SE)	SD	Mean	Mean (SE)	SD	Mean
School average SES[3]	54.0 (0.86)	5.79	–	52.1 (0.76)	6.05	–
School average Sixth class Reading[4]	265.2 (2.30)	15.39	263.2	257.3 (3.19)	21.88	258.5
School average Sixth class mathematics[4]	251.8 (3.32)	20.82	264.5	253.7 (3.59)	24.07	259.9

[1]Based on SLG with at least 15 Sixth class pupils and NA '09 schools with at least 15 Sixth class pupils and with average SES at or above the minimum SLG average SES

[2]Only 20% (N=27) of NA '09 schools have at least 15 Sixth class pupils and have average SES at or above the minimum found in SLG and were not located in rural areas.

[3]Across Sixth class pupils who did the Reading test, in schools with at least 15 completed tests

[4]In schools where at least 15 Sixth class pupils did the relevant test

In SLG, the observed average *reading* achievement is about the same as the expected score (Table 7.5). However, the gap between observed and expected *mathematics* scores is about 13 points. Thus, in both SLG and NA '09 comparison schools, observed mathematics performance is lower than the expected performance, but the gap is about twice as large in SLG compared to NA '09. Of course, the analyses in this section are exploratory in nature and are based on a small number of NA '09 schools; therefore caution is advised in interpreting findings.

Differences in Achievement across Schools

In order to balance the focus of this chapter, the remainder emphasises Second class data. Some data for Sixth class are provided in the appendix.

In some schools participating in NAIMS and NA '09, more than one class at each grade level participated. Using Second class as an example, there were 1694 pupils in 73 classes across 54 SLG. In NA '09, there were 3839 Second class pupils in 202 classes across 140 schools. Gaeltacht schools had fewer pupils enrolled overall (see Chapter 5) and just one participating school had two Second classes.

Given that in some schools there was more than one class per grade level, it is relevant to consider whether variance in achievement should be examined using a three-level (i.e. pupil, classroom and school) structure or a two-level (i.e. pupil, classroom/school) structure. NAIMS was not designed to enable the partition of achievement variation into between-school and between-class, and as noted, there were

[43] The intercept in the regression equation for reading is 128.2. The intercept is the hypothetical average score when SES is zero. We know that average SES cannot be zero as the scale has a minimum value of 16 so a value is always added to the intercept to arrive at the estimated score. The value 258.5 is computed by adding the intercept to the parameter estimate multiplied by the value for average SES; i.e. 128.2 + (2.5 * 52.1). Similarly for mathematics, 259.9 = 134.9 + (2.4 * 52.1).

[44] The intercept in the equation for mathematics is 134.9. The expected mathematics score is computed as follows: 134.9 + (2.4 * 52.1).

comparatively few schools with more than one class per grade level. However, the study allows us to place some upper bounds on the likely size of the school-level component where there was more than one class per grade level per school. Table 7.6 presents estimates of variance components based on a two-level decomposition of variance (estimated for both school and classroom as the top level) and a three-level one, for reading achievement in SLG with two or more second classes.

The residual variance is about the same when a three-level structure is used and when a two-level structure is used with classroom as the top level (residual variances of 1987 and 1986, respectively, Table 7.6). However, when a two-level structure with school as the top level is used, the residual variance is over-estimated somewhat (2053, Table 7). Similarly, between-school variance is over-estimated in the two-level structure with school at the top-level compared to in the three-level structure; i.e. between-school variance accounts for about 5% of total variance in the two-level decomposition and just 2% in the three-level one. Given the magnitude of the standard errors associated with the variance components, it is preferable to focus on the overall picture of where the largest sources of variation come from. According to the three-level model, up to 7% of the total variance may be between schools (i.e. [variance estimate + 1.96*SE]/total variance), and up to 13% may be between classes within schools. This means that the majority of variance in achievement in SLG with two or more classes is *within* schools rather than *between* schools. In other words, knowing which particular SLG a pupil attends provides minimal information about his/her likely achievement.

Table 7.6: Estimates of between- and within-school variance in Second class reading achievement – random factors at school and classroom, school only and classroom only (SLG with two or more Second classes)

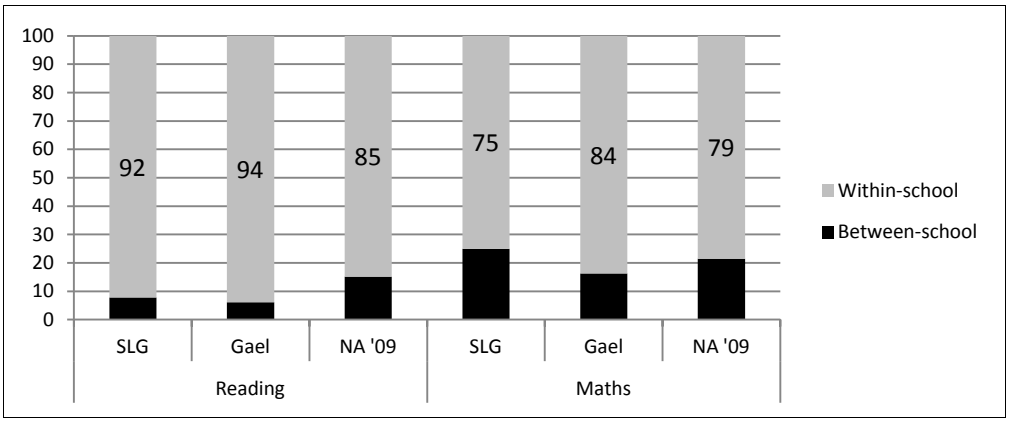
	Random effects for school and classroom		School as level 2 random effect		Classroom as level 2 random effect	
	Variance (SE)	% of Total	Variance (SE)	% of Total	Variance (SE)	% of Total
Between-school	43.2 (58.16)	2.0	104.2 (50.07)	4.8	–	–
Between-classroom	133.7 (74.77)	6.2	–	–	180.5 (65.19)	8.3
Residual	1986.9 (99.71)	91.8	2052.6 (101.66)	95.2	1986.0 (99.62)	91.7
Total variance	2163.9	100.0	2156.8	100.0	2166.4	100.0

[1]Estimated in SPSS Mixed Models, using Maximum Likelihood Estimation. Data are unweighted.

The remainder of this section focuses on two-level decomposition of variance using the school as the top level. All schools are included (not only those with two or more classes as above). A two-level decomposition of variance using school as the top level was preferred because the main interest from a policy perspective is how schools vary, not how classrooms across schools vary.

Figure 7.1 shows graphically the percentages of variation in reading and mathematics achievement at Second class which are attributable to differences between schools and to differences between pupils within schools (data are provided in the Appendix to Chapter 7, Table A 7.4; data for Sixth class are provided in the Appendix to Chapter 7, Table A7.5).

Figure 7.1: Estimates of the percentages of variance in achievement at Second class which are between and within schools, by domain and school type



Between-school variance in Second class reading achievement is somewhat lower in Irish-medium schools than in NA '09; e.g. at Second class, just 6-8% of the variation in reading achievement in Irish-medium schools is attributable to differences between schools compared to 15% in NA 09 (Figure 7.1). However, the standard errors associated with the variance components are quite large (see Appendix to Chapter 7, Table A7.4) so we cannot conclude that Irish-medium schools are more homogenous in terms of reading achievement than NA '09 schools. Similarly at Sixth class in Irish-medium schools, there is a lower percentage of variance in reading achievement between schools (SLG: 7%, Gaeltacht: 6%; NA '09: 16%), but again, standard errors are large (Appendix to Chapter 7, Table A7.5).

In mathematics, between-school variance in achievement in Irish-medium schools is similar to that in NA 09; e.g. at Second class, 25% of variation in mathematics achievement in SLG[45] is attributable to differences between schools compared to 21% in NA 09 (Figure 7.1 and Appendix to Chapter 7, Table A7.4). Similarly, at Sixth class, the percentages of between-school variance in mathematics achievement are similar in SLG (17%), Gaeltacht (15%) and NA '09 (23%) but again, the standard errors associated with the variance components are quite large (Appendix to Chapter 7, Table A7.5).

Understanding Second Class Reading Achievement in SLG

In earlier chapters, bivariate analyses were presented of the associations between pupil achievement and school and pupil characteristics. In this section, we look at the association between achievement and a number of characteristics simultaneously, using a multi-level modelling framework (see Box 7.2 for an overview and Box 7.3 for further technical detail). This allows us to look at, for example, the association between pupils' leisure reading and achievement in reading, while controlling for other pupil and school characteristics. This approach reduces the risk of misinterpreting the relationship between achievement and a characteristic of interest.

The focus is on Second class pupils because it is of policy interest to know whether or not there are significant associations between school characteristics and early reading achievement. The model was developed for SLG as between-school

[45] It is unclear how the variance in mathematics achievement might relate to the language of instruction in mathematics classes or to the language in which pupils took the mathematics test.

variance in Second class reading achievement was a little higher in SLG than in Gaeltacht schools. Time constraints prevented separate models being constructed for SLG, Gaeltacht and NA '09. Reading is used as an outcome variable as the English reading achievement of pupils in Irish-medium schools is of particular policy interest. Further details on the variables used in the model building process are given in Appendix to Chapter 7, Tables A7.6 and A7.7.

Box 7.2: Overview of the multilevel model of reading achievement

Multilevel modelling takes into account the clustered nature of the sample, i.e. that pupils are grouped in schools.

Variables for the model were selected on the basis of the findings in earlier chapters, policy relevance and levels of missing data on variables of interest (further detail is given in Appendix to Chapter 7, Tables A7.6 and A7.7). Candidate variables were organised into conceptually-related blocks. The variables which were examined were:

School structural features: participation in School Support Programme (SSP) under DEIS, school-average SES, school location, percent female enrolment, school enrolment size at first class (proxy measure of school size as newer SLG may not yet have had grades beyond Second class, this was also used in sampling);

School policy issues: language in which formal reading instruction begins, grade at which English reading instruction begins;

Characteristics of teachers at target grade in school (teacher characteristics aggregated to school level): proportion of female teachers, proportion of permanent teachers, average teacher experience, average class size at target grade, proportion of teachers with additional teaching qualifications;

Classroom practices at target grade: average time spent on English, frequency with which pupils read books of their own choosing in English, total books in classroom, computer in the classroom;

Pupil and family characteristics: gender, SES, single-parent family, at least one parent works full-time, number of siblings;

Home climate: pupil has a TV in his/her bedroom; pupil reads a book, comic or magazine for fun; time spent on English homework per day; total number of English and Irish books at home; at least one parent reads regularly; home educational resources at home; attends extra classes outside of school.

The following questions and answers are designed to assist with interpretation of the model.

What does it mean that 'a variable in the model is significantly associated with reading achievement after controlling for the other variables in the model'? An example may help…

Some pupils indicated that they have a TV in their bedrooms. The model allows us to consider whether or not having a TV in the bedroom is associated with reading achievement, assuming that all else is equal. That is, we can assume that all pupils come from families with a similar SES, all pupils have a similar number of books at home, never read for fun, spend the same amount of time on English homework, and attend schools with similar enrolment sizes. Assuming that all these things are equal, we find that pupils with a TV in their bedroom scored on average 16.7 points lower than pupils without one.

What is the intercept?

It is the expected reading score of the 'average' pupil in the 'average' school; i.e. a pupil with average family SES, no TV in his/her bedroom, who spends no time reading for fun and an average amount of time on English homework, has an average number of books at home and attends a school of average size. The intercept in the model described here is 267.5.

Why is 'zscore' in brackets after some variables in the model?

Some questions have just a few possible responses; e.g. a pupil could respond yes or no when asked about having a TV in the bedroom. Other questions had many possible responses; e.g. when parents wrote their job title. Questions which could take any one of a large number of responses resulted in continuous variables. It is easier to understand the model if the number associated with a continuous variable tells us about what would happen to a pupil's reading score if the value on that variable was changed by one standard deviation. To facilitate this, all variables which have 'zscore' written beside them can be interpreted in the same way as the following example:

The estimate associated with family SES in Table 7.7 is 4.5; i.e., a one standard deviation increase in SES is associated with a 4.5 point increase in reading performance. A pupil who comes from a family with average SES scores on average 4.5 points higher than a pupil with SES one standard deviation below the mean.

Box 7.3 provides some further detail on the modelling process and may be of interest to readers concerned with more technical detail.

Box 7.3: Some technical information about the model and the modelling process

The model presented in this section was developed in HLM 6.0. The following modelling procedure was employed: Each variable was tested separately. Non-significant variables were removed and each block of remaining variables was then evaluated simultaneously. All blocks were then entered simultaneously, and non-significant variables were removed until all variables retained significance at the .05 level.

Continuous variables were grand mean centered and standardised to have a mean of zero and standard deviation of one (number of pupils in First class was centered but not standardised). Thus, the parameter estimate associated with a continuous variable (other than number of pupils in First class) corresponds to the expected change in achievement associated with a one-standard deviation increase in the explanatory variable. Prior to finalising the model, significant interactions between pupil SES and other pupil-level variables were examined. Tests of significance of curvilinear terms, cross-level interactions and random slopes were examined. Explained variance was computed on the basis of the residual variance of the final model compared to the total variance of the unconditional model.

Following the finalisation of a two-level model, a comparable three-level model was fitted in order to determine if parameter estimates varied substantially. Differences in parameter estimates between the two-level and three-level were very small, thus discussion focuses on the two-level model only.

Technical discussion is ongoing regarding the appropriateness of using weights in multilevel models (see e.g. Aitkin & Aitkin, 2011; OECD, 2009; Rabe-Hesketh & Skrondal, 2006). If weights are applied (e.g. as in Gilleece, Shiel, Perkins & Proctor, 2009), a school-level weight is used at the school level and a pupil-within-school weight at the pupil level. An alternative approach (see e.g. Aitkin, Francis & Hinde, 2005) involves evaluating the significance of sampling variables during the model-building process. The latter approach is employed here.

HLM 6.0 employs list-wise deletion; i.e. a case is deleted if missing data on any model variable. In order to conserve cases, a missing indicator was used when a variable was deemed important but had a high level of missingness. Cases were retained by recoding the original variable's missing values to the mean (in the case of a continuous variable) or to zero (in the case of binary indicator variables), along with a dummy indicator which was given the value of one when data were missing and zero otherwise. After listwise deletion and with the inclusion of missing indicators, 88.3% of the original dataset remained. As this missing value approach is no longer the preferred method in the literature (see e.g. Cohen, Cohen, West & Alken, 2003), once the model was finalised, it was compared to one which excluded cases which were missing data on any of the variables in the final model. There were very small differences in parameter estimates between the two models, although the intercept changed from 260 to 267 indicating that pupils who were dropped from the model appeared to be lower achievers. The latter model was based on 79.7% of the original dataset and was more parsimonious (i.e. a cross-level interaction between school size and pupil leisure reading was not statistically significant, and at school-level, school location was not statistically significant). Therefore, the model which excluded cases with missing values was deemed preferable.

At school level, just one variable – school enrolment size at First class – was statistically significant in the final model (Table 7.7). Each additional pupil enrolled at First class was associated with a 0.3 point increase in average reading achievement. It was noted in Chapter 2 that during the sampling process, a distinction was drawn between SLG which had been established prior to 2001-2002 and those which were established after this time and that newer SLG were sampled on the basis of the number of pupils in First class. Thus for modelling purposes, enrolment size at First class was used as a proxy measure for school size as overall school enrolment size is expected to co-vary with year of opening. The parameter estimate for enrolment size at First class in the final model (0.3) does not differ substantively from the parameter estimate in the null model (0.38, see Appendix to Chapter 7, Table A7.6). This indicates that the association between school size and reading achievement is broadly independent of the other variables in the final model.

Table 7.7: Final multilevel model of reading achievement – Second class, SLG

	PE	SE	Test stat	df	p
Intercept	267.5	2.39			
School level					
School size (First class)	0.3	0.11	t=2.61	51	.012
Pupil level					
Pupil has a TV in his/her bedroom	-16.7	2.43	t=-6.85	1342	<.001
Family SES (zscore)	4.5	1.06	t=4.26	1342	<.001
Pupil reads for fun occasionally (yes – no)	9.6	2.77	t=3.47	1342	.001
Time spent on English homework					
Time spent on English homework (zscore)	-7.9	1.66	a	a	a
Time spent on English homework (zscore) squared	1.0	0.21	t=4.81	1342	<.001
English and Irish books at home (zscore)	10.6	1.37	t=7.74	1342	<.001

[a]Significance test is provided for curvilinear term only

School-average SES was significant when tested on its own but was no longer significant with the inclusion of the other variables. As noted earlier in this chapter, between-school variance in reading achievement at Second class in SLG is low, at just 8%. Thus, between-school variance is a small proportion of the total variance so it is perhaps not surprising that few school-level variables are statistically significant in the final model.

All else being equal, pupils who indicated that they had a TV in their bedrooms achieved an average score that was 17 points lower than pupils who did not have TV in their bedroom. This difference amounts to about one-third of a standard deviation on the reading achievement scale.

A change of one standard deviation in pupil SES was associated with a change of nearly five points in reading achievement. This shows a relatively weak relationship between family SES and achievement when other variables in the model are controlled for.

Spending increased amounts of time on English homework (as reported by parents) was associated with lower reading achievement, other things being equal. The association between reading achievement and time on English homework is not simply linear, as seen by the statistically significant squared term in the model. On average, pupils who spent the least amount of time on homework (i.e. one standard deviation below the mean amount of time) had a reading score which was nine points higher than pupils who spent a medium amount of time on homework (i.e. average amount of time); these pupils in turn had an average score which was seven points higher than that of pupils who spent the most amount of time on English homework (i.e. one standard deviation above the mean amount of time).[46] It is likely that the negative association between time spent on homework and reading achievement may be accounted for by weaker pupils needing longer to complete homework tasks.

[46] The parameter estimate for time on English homework is -7.9. This is multiplied by the amount of time a pupil spent on homework. The parameter estimate for the squared term is 1.0 (this is multiplied by a pupil's time on homework squared). Time spent on homework was z-standardised to have a mean of 0 and standard deviation of 1. Therefore, a pupil who spent the average amount of time on homework has a value of 0 for time on homework and has a change in reading achievement of (-7.9*0)+(1.0*0*0)=0 while a pupil who spends one standard deviation above the mean time on homework has a change in reading score of (-7.9*1)+(1.0*1*1)=-6.9.

Other things being equal, pupils who indicated that they read for fun occasionally scored about ten points higher (one-fifth of a standard deviation) on average than pupils who reported never reading for fun. Having higher numbers of books at home was also associated with higher reading achievement. A one standard deviation increase in the number of books in a pupil's home was associated with an average increase of almost 11 points (about one-fifth of a standard deviation). Pupils at the 25th percentile on the books scale had about 60 books at home and the model indicates that these pupils would be expected to score about 8 points lower than those with the average number of books at home (about 200).[47] Pupils at the 75th percentile on the total books scale had about 375 books at home and are expected to score about 10 points more than those with the average number of books.

There were no statistically significant cross-level interactions or random slope variations in the model. Table 7.8 shows the percentage of variance explained by various combinations of variable blocks. Using pupil SES as the only predictor variable, the model explains 43% of between-school variance and 4% of within-school variance. Using pupil SES and home climate (i.e. number of books at home, pupil engages in leisure reading, time spent on homework, and TV in pupil's bedroom) as explanatory variables explains 54% of between-school variance and 16% of within-school variance. The significance of the home climate variables lend further support to the recommendation of Eivers et al. (2010a, p.96) that

> The DES should initiate a public information campaign to advise parents about practices that help their child's general academic development (e.g., discussing books, estimating sizes or costs), and about practices that do not (e.g., unmonitored access to a TV in the bedroom).

Adding in the only significant school-level predictor (school enrolment size at First class) results in a model that explains 67% of between-school variance and 16% of within-school variance. The percentage of variance explained by each block is given in the Appendix to Chapter 7, Table A7.8.

Table 7.8: Percentage of variance in Second class reading in SLG explained by combinations of variable blocks[a]

	Pupil SES	Pupil SES and Home climate[b]	Pupil SES, Home climate, School size at First Class (i.e. final model)
Between-school	42.9	54.2	66.7
Within-school	4.3	16.4	16.4
Total	6.9	18.9	19.8

[a]Variance explained calculated on the basis of the fitted model compared to the null model which was computed using the same subset of cases as the fitted model.

[b]Pupil has TV in bedroom, pupil sometimes reads a book, magazine or comic for fun before or after school, time spent on English homework (reported by parent) and squared term, English and Irish books at home.

Overall, the model explains 19.8% of the total variance in reading achievement at Second class in SLG (Table 7.8). The current model explains a greater percentage of between-school variance (67%) than within-school variance (16%). This is in line with other previously published models of achievement in reading literacy in Ireland. For

[47] The 25th and 75th percentile values on the z-standardised scale are -0.80 and 0.98, respectively. Multiplying these by the PE (10.61) gives values of -8.49 and 10.43. The 25th percentile value of the total books scale before z-standardisation is 61. The corresponding 75th percentile value is 375.

example, at post-primary level, models of reading literacy have been shown to explain about 80% of between-school variance and about 40% of within-school variance (Shiel et al., 2001; Cosgrove et al., 2005). At primary level, a model of reading achievement in designated disadvantaged schools explained 69% of between-school variance and 29% of within-school variance (Sofroniou, 2004). A more recently published model of reading achievement at primary level explained 42% of the between-school variation and 19% of the within-school variation (Smyth et al., 2010).

A general problem with attempting to model reading achievement at Second class in the current study relates to the nature of the questions on the pupil questionnaire. To reduce the reading load to an age-appropriate level, Second class pupils were presented with dichotomous questions whereas Sixth class pupils were asked to rate frequencies using a four-point scale. The dichotomous question format did not allow subtle distinctions to be made between Second class pupils.

Generally, self-efficacy, self-concept and interest/engagement measures are consistently related with achievement (e.g. OECD, 2007). Specifically in the area of reading, pupils' attitudes towards reading have been found to be significantly and positively associated with reading achievement (as in Cosgrove et al, 2005). Further work on modelling achievement in Irish-medium schools might usefully include some attitudinal measures although the measurement and interpretation of these relationships can be problematic, given their sometimes circular nature (see Cosgrove et al., 2003; Van de Gaer, Gebhardt & Schulz, 2009; Williams & Williams, 2010). Parental motivation and the engagement of parents with their child's school were not examined in NAIMS and might also be expected to be positively associated with achievement (similar to the situation at post-primary level, see e.g. Byrne & Smyth, 2011). Future national assessments could usefully attempt to gather data on parental involvement in their child's school.

Key Points

- This chapter focuses primarily on Scoileanna Lán-Ghaeilge (SLG) and NA '09 rather than Gaeltacht schools as the smaller average enrolment size of Gaeltacht schools increases the possibility of a small number of atypical pupils skewing a school's results.
- The average school-level Sixth class reading score in SLG is about what would be expected, given the average school-level socioeconomic status (SES) of these schools.
- The average school-level Sixth class mathematics score in SLG is somewhat lower than what would be expected, given the average school-level SES of these schools.
- A group of NA '09 schools similar to SLG in terms of location and school-average SES also perform at about the expected level in reading but below expectations in mathematics.
- School-average SES accounts for a greater proportion of variance in Sixth class reading achievement compared to mathematics achievement.
- Between-school variance in reading achievement appears somewhat lower in Irish-medium schools than in NA '09. However, as the standard errors associated with variance components are large, further investigation of this issue is merited.

- A multilevel model of Second class reading achievement in SLG indicated that just one school level characteristic was significantly associated with reading achievement, once pupil level characteristics were considered. Higher pupil reading achievement was associated with larger school enrolment size (using enrolment at First class as a proxy indicator of overall enrolment size).
- It is not surprising that few school-level variables were statistically significant, given that between-school variance in Second class reading achievement in SLG was low, at just 8%. In other words, variation across schools was quite restricted so school-level characteristics are unlikely to explain differences in achievement.
- At pupil level, there was a statistically significant negative association between reading achievement and a pupil having a television in his/her bedroom. This is in line with the findings of Eivers et al. (2010a) who also found in NA '09 that on average, pupils with TVs in their bedrooms had significantly lower scores.
- The model also showed that higher pupil SES, having higher numbers of books at home and spending time on leisure reading were positively associated with reading achievement. That home climate variables such as books at home and spending time on leisure reading explain additional variance in achievement over and above SES is consistent with analyses involving students at post-primary level (Perkins et al., 2012).
- Spending longer periods of time on English homework was negatively associated with achievement. It is likely that this results from lower achieving pupils taking longer to complete homework.
- The model explained 67% of between-school variance and 16% of within-school variance. These are broadly similar to the percentages explained by another recently published model of reading achievement at primary level in Ireland (Smyth et al., 2010). An earlier model of reading literacy in disadvantaged primary schools explained a similar amount of between-school variance (69%) but a greater amount of within-school variance (29%) (Sofroniou, 2004).

Chapter 8
Conclusions and Recommendations

In this chapter, conclusions are drawn and recommendations made in several key areas – performance in English reading, performance in mathematics, relationships between socioeconomic status (SES) and performance, the language of beginning reading instruction, the language of mathematics instruction, support for at-risk pupils, time allocated to teaching, assessment, teacher professional development, parental choice and engagement, and pupil engagement. The recommendations are designed to complement those made in the report on the 2009 National Assessments of Mathematics and English Reading (Eivers et al., 2010a), and the actions set out in the *National Strategy to Improve Literacy and Numeracy 2011-2020 (*DES, 2011a) and subsequent circulars (DES 2011c; DES, 2012).

Performance on English Reading

A key aim of the current study was to compare the English reading performance of pupils in SLG, Gaeltacht schools, and Ordinary schools (NA '09). The outcomes show that pupils in Second and Sixth classes in SLG have higher mean scores than pupils in NA '09 schools on overall English reading, on reading vocabulary and reading comprehension, and on all reading processes assessed. Furthermore, pupils in Gaeltacht schools in Sixth class have significantly higher mean scores on overall English reading, reading vocabulary, reading comprehension and on three of four reading processes. At Second class, no significant differences were found between the performance of pupils in Gaeltacht schools and their counterparts in NA '09. These findings must be interpreted with respect to socioeconomic status. Average school-level performance in English reading in SLG at both Second and Sixth classes is about what would be expected on the basis of school average socioeconomic status, assuming a similar relationship between achievement and SES as in NA '09.

The findings for SLG are consistent with those of an earlier National Assessment of English Reading in 1988 (Department of Education, 1992), in which pupils in Fifth class in SLG outperformed pupils in Ordinary schools. However, in the 1988 study, the difference between SLG and Ordinary schools was one-half of a standard deviation, whereas in the current study, it was one-third of a standard deviation at both class levels assessed. Further, whereas in the 1988 assessment, pupils in SLG and Ordinary schools achieved similar scores at higher levels of achievement (the 70th, 80th and 90th percentiles), in the current study, pupils in SLG outperformed those in NA '09 at all benchmarks between the 10th and 90th percentiles.

The findings for Gaeltacht schools contrast with those of Macnamara (1966) who reported that the English reading performance of native-speakers of Irish (Gaeltacht pupils) in Fifth class was behind that of native-speakers of English born in Ireland by 13 months of English reading age. In the current study, pupils in Second class in Gaeltacht schools did not differ significantly from their counterparts (mostly native English speakers) in NA '09, while pupils in Sixth class in Gaeltacht schools significantly outperformed their counterparts in NA '09. However, three-quarters of Gaeltacht pupils in the current study reported speaking English as their main home language so it might be argued that these pupils differ from the native Irish speakers in Macnamara's study, which is now close to 50 years old. Furthermore, we may assume

that in the current study, even those pupils who reported speaking Irish as their main home language are exposed to more English in their everyday lives than pupils in the 1960s.

The finding that just 5-6% of pupils in Second and Sixth classes in SLG and Gaeltacht schools achieved below Level 1 on the reading proficiency scales indicates that, across Irish-medium schools in general, fewer pupils have serious reading difficulties relative to the population assessed in NA '09. It is unclear why this is the case, and it may reflect a combination of factors – for example, more intensive support from both class and support teachers, a facilitative effect because fewer pupils have reading difficulties, or stronger home support. It is also possible that, where parents of children at risk of reading difficulties (e.g., due to delayed language development) had a choice, they may have decided not to enrol their child in an Irish-medium school. Some pupils in SLG who were at risk of literacy difficulties may have transferred to English-medium schools prior to Second class, though no information is available on this.

The finding that pupils in Second class in Gaeltacht schools achieved a mean score in English reading that was not significantly different from that achieved by pupils in NA '09, and that pupils in Sixth class in Gaeltacht schools achieved a significantly higher mean score suggests that pupils in Gaeltacht schools may eventually overcome a relatively slow start in learning English reading by the time they reach Sixth class. The study by Parsons and Lyddy (2009) reviewed in Chapter 1 as well as research on the effects of French immersion programmes in Canada indicate that, with experience and appropriate supports/instruction, weaker initial performance in second-language reading can improve.

Despite significantly higher overall performance relative to their counterparts in NA '09, pupils in Sixth class in Gaeltacht Schools did not perform significantly differently from NA '09 pupils on one of the reading process subscales – Examine & Evaluate. Performance in this area – which involves higher level thinking and written responses to comprehension questions – could be strengthened.

Estimates of between-school variance in reading achievement (differences between schools) are low in Second class in both SLG (8%) and Gaeltacht schools (6%), compared with NA '09 (15%). Estimates for Sixth class are similarly low. These data indicate that Irish-medium schools are more similar to one another in terms of performance in English reading than schools in NA '09.

Recommendations

1. Irish-medium schools should continue to carefully monitor the performance of pupils who are experiencing difficulties in English reading, how they cope with increasing literacy demands in English and Irish, and how they respond to the support they receive at school and at home.
2. Gaeltacht schools should place a stronger emphasis on the development of higher-order English reading skills (Examine and Evaluate), especially in the Senior classes.

Performance on Mathematics

Another aim of the current study was to compare performance in mathematics across SLG, Gaeltacht schools and schools in NA '09. A key finding is that, while the mean mathematics performance of pupils in Second class in SLG was significantly higher than that of pupils in NA '09, performance in Sixth class was not significantly different. Conversely in Gaeltacht schools, Sixth class pupils had a significantly higher

mean score than their counterparts in NA '09, but performance at Second class was not significantly different to NA '09. Although pupils in Sixth class in SLG and Second in Gaeltacht schools had higher mean scores than their counterparts in NA '09, differences were not statistically significant. These outcomes suggest that, for pupils in SLG, performance may recede somewhat between Second and Sixth classes, while for pupils in Gaeltacht schools, it improves a little (note that differences between mean scores in SLG and Gaeltacht schools are not significantly different at either grade level) Further, unlike reading, where average school reading performance in SLG is accurately predicted by school average socioeconomic status, average school-level performance in mathematics is below what would be predicted on the basis of SES.

The distributions of mathematics performance in SLG varied in a number of ways. At Second class, pupils scoring at all key benchmarks between the 10th and 90th percentiles had higher mean scores than their counterparts in NA '09 schools. At Sixth class, lower-achieving pupils – those scoring at the 10th, 20th and 30th percentile ranks – had scores that were higher than their counterparts in NA '09. In contrast, higher-achieving pupils – those scoring at the 60th, 70th, 80th and 90th percentiles – had scores that were almost identical to those of pupils performing at these benchmarks in NA '09. At both Second and Sixth classes, marginally fewer pupils in SLG scored below Level 1 than in NA '09 (8% vs. 10% in Second, 7% vs. 10% in Sixth). In Second class, more pupils in SLG than in NA '09 achieved at Level 4 (13% vs. 10%), while in Sixth class, the percentages were about the same for SLG and NA '09 (9% vs. 10%). Hence, it seems that higher achievers in SLG do not maintain their advantage between Second and Sixth classes. This may arise because of heightened language demands placed on pupils as they learn more complex mathematical concepts in the Senior primary classes. Evidence for this comes from the observation that pupils in Sixth class in SLG achieved mean scores that were not significantly different from those of pupils in NA '09 on Measures, Shape & Space and Data – areas that all require conceptual understanding – or on the Recall, Integrate & Connect, Reason or Apply & Problem Solve processes. Indeed, the only areas in which pupils in Sixth class in SLG outperformed their counterparts in NA '09 were in Number/Algebra and Implement, which do not draw on language to the same extent as other aspects of mathematics.

The relatively disappointing performance in mathematics of higher-achieving pupils in Sixth class in SLG can be compared with the underperformance of higher-achieving 15-year olds in Ireland in PISA 2009 mathematics (Perkins et al., 2012).

The work of Ryan (2011) (summarised in Chapter 1) is relevant in interpreting the small decline in reasoning and problem solving observed in SLG between Second and Sixth classes. Although she concluded that immersion education did not confer any particular disadvantage on mathematical problem solving, she suggested that the Fifth class pupils in her study would benefit from acquiring and using more mathematical terms and a more specifically mathematical register as they engage in word problems. The relatively disappointing average performance of pupils in SLG in the current study on some aspects of mathematics including reasoning and problem solving, despite high average performance in English reading, suggests that these pupils may have difficulties with some aspects of mathematical language.

Pupils in Gaeltacht schools in Second class achieved a higher mean mathematics score than pupils in NA '09 (256 vs. 250), but the difference was not statistically significant. At Sixth class, pupils in Gaeltacht schools achieved a significantly higher mean score in mathematics than pupils in NA '09 (259 vs 250). The apparent improvement between Second and Sixth is relatively small (three points). It appears to be associated with stronger performance among lower-achieving pupils.

Whereas 8% of pupils in Gaeltacht schools scored below Level 1 in Second class, just 5% scored at this level in Sixth. It is noteworthy that, in Second class, pupils in Gaeltacht schools achieved a mean score below that of pupils in NA '09 on Shape & Space (although the difference was not statistically significant), and this may be an area that could be focused more strongly on in Gaeltacht schools. However, by Sixth class, pupils in Gaeltacht schools had a mean score in this content area (259) that was significantly higher than the mean score of pupils in SLG (251) and in NA '09 (250). It may be the case that the terminology of Shape & Space was less accessible to pupils in Second class, but that, by Sixth class, both language and concepts around this content strand had been strengthened. It is also noteworthy that the mean scores of pupils in both Second and Sixth classes in Gaeltacht schools were significantly higher than those of pupils in NA '09 on the Measures content strand and on the process of Apply & Problem Solve. These aspects of mathematics might be expected to draw heavily on pupils' language resources. Pupils in Gaeltacht schools also did better on Implement in Second and Sixth classes, though this aspect of mathematics may be less dependent on language.

At Second class, 25% of variation in mathematics achievement in SLG, 16% in Gaeltacht schools, and 21% in NA '09 is attributable to differences between schools. The corresponding estimates for Sixth class are 17%, 15% and 23%. The estimates for Irish-medium schools are higher for mathematics than for English reading, indicating that differences between schools are greater for mathematics.

Recommendations:

3. In line with providing pupils with access to the full curriculum through the medium of Irish, Scoileanna Lán-Ghaeilge (SLG) should place a stronger emphasis on developing mathematical reasoning and problem solving in the Senior classes, paying particular attention to developing and using mathematical language in Irish as pupils engage in these processes.
4. Qualitative research should be conducted into the teaching of mathematical reasoning and problem solving in the Senior classes in schools, with an emphasis on how instructional dialogue, language register and participation vary across SLG, and between SLG, Gaeltacht schools, and English-medium schools.

Relationship between Socioeconomic Status and Performance

Although the authors of the report on the 1988 National Assessment of English Reading in Fifth Class (Department of Education, 1991) did not have access to information about the socioeconomic status of participating pupils, they attributed the stronger performance of pupils in SLG schools (relative to those in Ordinary schools) to the higher SES of their parents, and the lower pupil-teacher ratios in SLGs. In the current study, a measure of SES was obtained by transforming parents' occupations onto an international SES scale. Then, associations between the resulting SES scores and pupil achievement were examined. The mean SES score of pupils in SLG was significantly higher than that of pupils in Gaeltacht and NA '09 schools at both Second and Sixth classes. Further, relative to NA '09, pupils in SLG were more strongly represented in the top third of the SES scale, and less strongly represented in the bottom third. Subsequent analyses established that pupils in Second and Sixth classes in high-SES families in both SLG and Gaeltacht schools achieved significantly higher mean scores than pupils in low-SES families. At school level, the average SES of SLG schools (based on data for Sixth class) was significantly higher than that of both Gaeltacht and NA '09 schools.

One of the key findings of the current study is that the overall strong performance of pupils in SLG on reading is associated with their favourable socioeconomic backgrounds. At Sixth class, the *expected* school-level mean reading score in SLG (in schools where at least 15 pupils at that class level completed the reading test), based on the relationship between socioeconomic status and reading in NA '09, was about the same as the *observed* mean reading score (expected score: 263; observed score: 265). While we cannot say that the cause of higher achievement in SLG is high school-level socioeconomic status, we can accurately predict school-level average performance on reading using school-average SES only. It is likely that the high average SES of pupils in SLG contributes to a school environment in which it is possible to achieve high average levels of reading performance. It is also likely that higher-SES parents are more proactive in promoting their children's learning, and in providing opportunities for additional learning.

The multilevel model of achievement in reading in Second class confirms that pupil socioeconomic status and reading performance are related. However, it is also clear that, after controlling for SES, other key home climate variables such as number of books in the home (a proxy for home educational environment), whether or not a child has a television in his/her bedroom, and whether a child reads for leisure are also associated with reading performance at the individual pupil level.

In the case of mathematics in SLG, the observed score of 252 in Sixth class (in schools where at least 15 pupils completed the test) was well below the predicted score of 265. This outcome indicates a weaker association between mathematics and socioeconomic status in SLG, leading to the conclusion that other factors besides socioeconomic status are associated with performance. These may include the challenge of teaching mathematical concepts and associated language in Irish to pupils for whom Irish is not a first language or the main language spoken at home. It may also be the case that many parents of pupils in SLG are not in a position to provide support in mathematics through Irish.

The average socioeconomic status of pupils in Gaeltacht schools was marginally lower than that of pupils in NA '09 schools, with 39% pupils of pupils in Gaeltacht schools in low-SES families, 33% in medium-SES families, and 28% in higher-SES families, compared with one-third in each of these categories in NA '09. At Second class, pupils in high-SES families achieved a significantly higher mean English reading score than pupils in low-SES families, while the difference between medium- and low-SES families was not statistically significant. At Sixth class, pupils in high-SES families achieved a significantly higher mean score than pupils in low-SES families. Pupils in medium-SES families in turn achieved a significantly higher mean score than pupils in low-SES families. The lack of a significant difference in Second class between pupils in medium- and low-SES families may relate to the fact that English is a second language for many Gaeltacht pupils, and that pupils of average and low SES take longer to acquire proficiency in English reading than pupils for whom English is a first language or for whom English features more strongly in out-of-school contexts.

It is of particular interest that the relationships between SES and achievement were weak among Gaeltacht pupils in mathematics, with just one significant difference observed – that between pupils in high- and low-SES families in Sixth class. Again, this may reflect the challenge experienced by some pupils in Gaeltacht schools in acquiring mathematical concepts in Irish, particularly if they do not speak the language of instruction at home. Certainly, the fact that one-half of pupils in Gaeltacht schools were taught mathematics through a combination of English and Irish would suggest that this may be the case.

In SLG, where just 8% of pupils attended schools in SSP under DEIS, the relationship between DEIS status and reading achievement was similar to that found in other studies (e.g., Eivers et al., 2010a), with pupils in SSP schools doing significantly less well on average in both English and mathematics than their counterparts in non-SSP schools. The large differences in achievement (over one-half of a standard deviation in English reading and two-thirds in mathematics) underline the need to look more intensively at the performance of disadvantaged pupils in SLG schools in the SSP, and how they can be supported to achieve higher levels of performance. In part, this relates to the effectiveness of programmes and actions being implemented to raise performance across all SSP urban schools (e.g., Reading Recovery, First Steps). As a follow-up to the current study, it would be important to examine in greater detail, the programmes offered to pupils in English reading and mathematics in SLG in the SSP programme, in terms of identifying what adjustments, if any, should be applied.

In looking at achievement in rural SSP schools in the Gaeltacht compared to those outside the Gaeltacht, Weir, Archer and Millar (2009) found that performance in reading in Third and Sixth classes in rural SSP schools *in* the Gaeltacht was significantly lower than that in rural SSP schools *outside* the Gaeltacht, while performance in mathematics at these class levels was not significantly different. There were no significant differences in performance between pupils in Gaeltacht schools in SSP in NAIMS, and rural schools in SSP outside the Gaeltacht in NA '09, in either English reading or mathematics. Differences in outcomes with regard to reading between, on the one hand, Weir et al.'s study, and, on the other, NAIMS/NA '09, may arise from differences in test design and/or differences in sampling and weighting procedures.

Recommendations:

5. In line with the *National Strategy to Improve Literacy and Numeracy 2011-20,* Irish-medium schools should seek to raise performance on reading literacy, and should take the socioeconomic status of their pupils into account in setting targets aligned to the *Strategy*.
6. In line with the *National Strategy*, Irish-medium schools should seek to raise average performance in mathematics. SLG should focus in particular on the Senior classes, where the performance of higher achievers should be monitored closely.
7. SLG in the SSP under DEIS should monitor performance carefully with a view to significantly reducing the gaps in English and mathematics relative to non-SSP schools, in both Junior and Senior classes. In doing so, they should be guided by relevant research on the effective teaching of language, literacy and numeracy in bilingual contexts.
8. Gaeltacht schools in SSP under DEIS should continue to carefully monitor the English reading performance of pupils once formal instruction begins, and should intensify work in English reading and related areas (e.g., oral language) to ensure that pupils make adequate progress, even if English is not their first language.
9. The DES and relevant agencies should advise Irish-medium schools in SSP on effective, research-based approaches to accelerating the performance of at-risk pupils in English reading and mathematics, taking the bilingual context of schools into account, including the language of beginning reading instruction.
10. The National Council for Curriculum and Assessment should take the needs of Irish-medium schools into account as it prepares its new integrated language curriculum for primary schools.

Language of Beginning Reading Instruction

The current study does not provide an answer to the question of whether instruction in reading should begin in Irish or English. While almost three-quarters of pupils in Second class in SLG had been provided with formal reading instruction in Irish before instruction in English began, no achievement differences in English reading were found between pupils who received instruction in Irish reading first, pupils who received instruction in English reading first, and pupils who received instruction in both Irish and English reading at the same time. In Gaeltacht schools, where about one-third of pupils received instruction in English reading first, one third in Irish reading first, and one-third in both Irish and English at the same time, Sixth class pupils who received initial instruction in English and Irish at the same time had a significantly lower mean score, by one-third of a standard deviation, than pupils who received instruction in English reading first.

The outcomes for both SLG and Gaeltacht schools must be considered inconclusive for a number of reasons. First, pupils were not randomly allocated to instructional groups. Second, school policy on initial reading instruction, as outlined by school principals, may not reflect practice. Third, it is not possible to control for the fact that pupils who received instruction in Irish first may have acquired some English or Irish reading skills in settings outside of the school. Fourth, as O'Laoire and Harris (2006) and others have noted, the language in which initial reading instruction is provided may be a response to the needs of pupils attending a particular school, and it may not be possible to specify one 'best' approach that is applicable across all Irish-medium schools. Nevertheless, it seems worthwhile to monitor the effects of various models, especially the simultaneous introduction of English and Irish reading.

In the current study, the vast majority pupils in both Gaeltacht schools and SLG were reported to have begun reading instruction before the end of Senior Infants. Hence, it was not possible to consider how a postponement of instruction in English reading until First or Second class might affect performance levels.

Recommendation:

11. Further research should be conducted into the impact of various approaches to beginning reading instruction in Irish-medium schools, including the effects of introducing English and Irish reading at the same time and the extent to which early language work prepares children to access the full curriculum through Irish.

Language of Mathematics Instruction

Pupils in the current study received mathematics instruction in either Irish only or Irish and English combined. No teachers reported providing instruction in English only. In SLG, 80% received instruction in Irish only in Second class, compared with 50% in Sixth class. In Gaeltacht schools, about one-half of pupils at each grade level were taught mathematics through Irish only, and half in Irish and English combined. Although no significant differences were observed in the performance of pupils in either school type who were taught mathematics through Irish only or Irish and English combined, the shift towards combined instruction by Sixth class in SLG is noteworthy, especially when considered alongside achievement differences between Second and Sixth classes. According to teachers, the shift towards instruction in a mix of English and Irish arises because most pupils will learn mathematics through English at post-primary level (and hence need to be ready for this), and because many pupils struggle to access important mathematics concepts in Irish rather than English. This raises the question of whether more intensive mathematics instruction through Irish

can be provided that builds on the work achieved up to Second class, or whether available resources should instead be allocated to other uses (e.g., addressing the needs of pupils with very low achievement). In any event, it is likely that, as with schools in general, SLG schools will need to implement strategies designed to raise performance levels in mathematics over the next decade, in line with proposals in the *National Strategy to Improve Literacy and Numeracy* 2011-20 (DES, 2011).

The situation with Gaeltacht schools is noteworthy. About one-half of pupils are taught mathematics through Irish, and one-half through English and Irish combined, at both Second and Sixth class levels. Yet, by Sixth class, pupils' overall performance is significantly higher than that in NA '09 schools. Again, the current study cannot say if current instructional arrangements are optimal, and additional study, involving observation of instruction in mathematics classes in Gaeltacht schools, would provide clearer insights into what modifications to instructional language, if any, are needed (see Recommendation 4 above).

It is interesting that some teachers of pupils in Sixth class in SLG in the current study are influenced by the future educational plans of their students (attendance at a post-primary school in which mathematics will be taught through English) in deciding to teach mathematics through a combination of Irish and English. It is also possible that the decision to use both English and Irish could also be related to factors such as teachers' pedagogical knowledge in mathematics, and their confidence in teaching higher-level mathematics skills through Irish.

Recommendation:

12. Future research involving Irish-medium schools should examine more closely the relationship between teachers' confidence and competence in using Irish to teach higher-order mathematics skills and raise pupil performance in mathematics.

Support for At-risk Pupils

A particular feature of the performance of pupils in both SLG and Gaeltacht schools is the low proportion achieving below Level 1. In English reading 5% of pupils in Second class in SLG achieved below Level 1 on the proficiency scales, while 4% in Sixth class did so. Estimates for Gaeltacht schools were also below 10%. In mathematics, 8% in Second class and 7% in Sixth class in SLG were classified as scoring below Level 1, while 8% in Second class and 5% in Sixth class in Gaeltacht schools were similarly classified. Yet the proportions in receipt of Learning Support/Resource Teaching were much higher, ranging from 8% for mathematics in Second class in SLG to 20% for English in Second class in Gaeltacht schools. These data suggest the potential for increased flexibility in the use of support services within Irish-medium schools, while continuing to address very low levels of achievement among a minority of pupils. In the case of SLG, for example, it might be desirable to increase levels of support in mathematics, including additional support for some higher-achieving pupils.

In Sixth class in SLG, 21% of pupils are in classes in which in-class support is offered for English reading. This compares favourably with both Gaeltacht schools (7%) and NA '09 schools (5%) and is in line with current DES policy. Levels of in-class support for mathematics are 14%, 16% and 11% respectively. Hence, there may be scope for additional integration, in the case of both English reading (Gaeltacht schools) and mathematics (both SLG and Gaeltacht).

Recommendations:

13. Irish-medium schools should review levels of support/resource teaching, especially in Senior classes, with a view to distributing support in such a way that all pupils can access the full curriculum including English, mathematics and Irish.
14. Irish-medium schools should continue to find ways to integrate support services into classrooms where possible, in line with current DES guidelines, with services being provided for English, mathematics and Irish on a needs basis.

Time Allocated to Teaching

The recommended time allocations for English (L2) and mathematics are 3.5 hours and 3 hours per week respectively (translated to 42 and 36 minutes per day respectively), with two hours per week of discretionary time also available. In practice, pupils in Second class in SLG in the current study spent 48 minutes per day on English and 46 minutes for mathematics, while at Sixth class, they spent 55 minutes on English and 52 minutes on mathematics. Corresponding time allocations in Gaeltacht schools were 43 minutes on English and 42 on mathematics in Second class, and 50 minutes on English and 51 on math in Sixth. Hence, on average, both school types allocated extra time to English and mathematics.

Should schools and teachers allocate additional discretionary time to teaching English and mathematics? Given the strong performance on English reading of pupils in SLG, especially schools outside of SSP under DEIS, the allocation of additional time to English does not seem warranted. Some additional time may be required for English in SLG schools in the SSP, and in the Junior classes in Gaeltacht schools where English is not the first language. In the case of mathematics, additional time might benefit pupils in the Senior classes in SLG, if they are to increase their engagement in reasoning mathematically and solving more non-routine problems in real-life contexts.

In considering the allocation of time for English in Irish-medium schools, it should be noted that pupils at risk of reading difficulties may not have the same opportunities as pupils in English-medium schools to engage in English reading in subject areas other than English, and this may mean that additional discretionary time for reading non-fiction texts needs to be added to English lessons.

Recommendations:

15. SLG and Gaeltacht schools in the SSP and Gaeltacht schools where high percentages of pupils speak English as the main language should allocate additional discretionary time to the teaching of English.
16. In line with the *National Strategy to Improve Literacy and Numeracy 2011-20*, SLG should continue to allocate additional discretionary time to teaching mathematics, particularly in the Senior classes, with a view to increasing pupils' engagement in reasoning mathematically and solving non-routine problems.

Access to and Use of Technology

Computer access was widespread, with 87% of pupils in Sixth class in SLG and 96% in Gaeltacht schools in classrooms with at least one computer. The respective percentages for Second class were 77% and 78%. However, the ratio of pupils to computers was greater in SLG (23 in Second and Sixth classes) than in Gaeltacht schools (12 in Sixth and 13 in Second). According to teachers at both Second and Sixth class in SLG and Gaeltacht schools, two-fifths of pupils in classrooms with a computer used one at least weekly for English lessons. Usage in mathematics lessons was more

frequent in Second class (52% of pupils in SLG and 43% in Gaeltacht schools were in classrooms with at least weekly usage) than in Sixth class (17% in SLG, 32% in Gaeltacht schools). Where computers were used in mathematics lessons at Sixth class, they were most commonly used for practicing mathematical facts and basic skills, and least often used for engaging in handling data or solving non-routine problems.

Recommendation:

17. Irish-medium schools should increase the range of computer-based activities in mathematics in which students engage in Sixth class, especially those that involve handling data, solving non-routine problems, and performing other tasks requiring higher-level thinking.

Assessment

Principal teachers reported regular (annual or more often) administration of standardised tests in English reading and mathematics and use of outcomes for a range of purposes (e.g., identifying pupils with learning difficulties, providing feedback to parents, and using outcomes to monitor school-level performance) in almost all Irish-medium schools. Class teachers reported infrequent use of certain forms of non-standardised assessments, with 50% or fewer pupils in Sixth classes in SLG schools where pupil self-assessment, teacher-made checklists, or learning portfolios were implemented at least monthly in English or mathematics lessons. Teachers of Sixth class pupils in Gaeltacht schools also made limited use of teacher-made checklists, reflective journals, portfolios and curriculum profiles to assess English, even though these strategies are strongly endorsed in the NCCA (2007) publication, *Assessment in the Primary School Curriculum: Guidelines for Schools*. A similar finding emerged in the 2009 National Assessments of Mathematics and English Reading (Eivers et al., 2010a).

The revision of the English curriculum using a 'learning outcomes' approach, and the development of examples of pupils' work and learning that demonstrate achievement of those outcomes (as outlined in DES, 2011) can be expected to facilitate the use of non-standardised assessments in all primary schools. However, these important resources will not be available for all classes until 2016, and, in the meantime (again in line with DES, 2011a), it would seem important for teachers in Irish-medium schools to use a broader set of assessment tools in both English and mathematics, perhaps following planned continuing professional development (CPD) in literacy and numeracy.

Recommendation:

18. Teachers in Irish-medium schools should implement a broader set of assessment tools on a more frequent basis in both English and mathematics classes, including teacher-made checklists, documented observations, and learning portfolios.

Continuing Professional Development for Teachers

Access to relevant professional development for English and mathematics is a significant problem, not just in Irish-medium schools, but across the primary and post-primary sectors generally (Eivers et al., 2010a; Gilleece et al., 2009). In the current study, 52% of pupils in Second class in SLG and 41% in Gaeltacht schools were taught by teachers who had not undertaken any professional development in English reading or mathematics in the three years prior to NAIMS. The corresponding estimate for NA '09 was 35%. At Sixth class level, the average number of days of professional development (PD) in English and mathematics combined completed by teachers in

SLG was 2.3 days, while for Gaeltacht schools it was 3.5 days. This situation seems likely to be addressed in the context of the *National Strategy for Literacy and Numeracy 2011-2020*, where it is stated that PD courses of at least 20 hours duration in literacy, numeracy and assessment will be provided every five years for primary teachers, and that teachers will be required to participate in such courses to maintain their professional recognition. According to the *National Strategy*, set up of this provision will begin in 2011-12, with extended provision from 2012-13.

It would seem important to align the content of PD in literacy and numeracy for teachers in Irish-medium schools with their expressed needs, as well as those arising from national policy initiatives. In NAIMS, aspects of English in which teachers at both Second and Sixth classes indicated a need for input on creative writing, oral language, ICTs (including interactive whiteboards), strategies for teaching low-achieving pupils, selection of texts and resources, and writing (other than creative writing). In mathematics, aspects identified by teachers were ICTs, problem solving/developing higher-level skills, teaching in multi-grade classes/differentiation, working with manipulatives/hands-on materials, working with pupils with special educational needs, working with higher-achieving pupils and assessment. Teachers' needs in the areas of problem-solving and developing higher-order skills are consistent with concerns raised earlier in this report about the teaching of mathematical reasoning and problem solving through Irish.

In the current study, teachers also indicated their levels of confidence in teaching specific aspects of English and mathematics. Areas in which teachers expressed relatively low levels of confidence were consistent with those in which they expressed a need for further CPD. In English, these included teaching low achievers in reading, teaching reading skills in other subject areas, and using computers. In mathematics, they included integrating mathematics in to other subjects, using calculators to teach mathematics (Sixth class teachers), developing higher-level mathematics thinking skills, and using computers to teach mathematics.

Recommendation:

19. In addition to national priorities, continuing professional development in literacy and numeracy for teachers in Irish-medium schools should include topics identified by teachers as relevant to their current needs. In English these include creative writing, oral language, use of ICTs, strategies for teaching low-achieving pupils, selection of texts/resources and teaching spelling/phonics. In mathematics, they include ICTs, developing problem solving and other higher-level skills, multi-grade classes/differentiation, teaching lower-achieving pupils and pupils with special needs, implementing informal assessments, and teaching higher-achieving pupils.

Parental Choice and Engagement

In many cases, attendance by a pupil at an Irish-medium school reflects a conscious choice made by the pupil's parents. In an educational system that purports to address the needs of diverse groups, it is important that parents can continue to exercise this choice. Parental choice is reflected in parents' reasons for choosing an Irish-medium school for their child. Parents of pupils in Sixth class in SLG referred to reasons such as Irish being part of our cultural and linguistic heritage, the cognitive benefits of bilingualism and greater ease of early language learning, use of Irish language in the family, the reputation of individual schools, school ethos, and practical considerations (e.g., proximity to the school). A small minority referred to their child's future educational or employment opportunities as main reasons.

An important question concerns the extent to which parents need to be supported in accessing an Irish-medium education for their child. In NAIMS, just 5-8% of parents reported that they had attended an information evening aimed at helping their child with English reading or mathematics, although between 50% (Gaeltacht schools) and 80% (SLG) of pupils are in schools where principals reported that programmes are offered to parents to support their child's English reading and 10-20% of pupils are in schools where principals reported the availability of support programmes in mathematics. On the other hand, over 90% of parents in SLG and Gaeltacht schools reported that they had discussed their child's progress with his/her teacher in the year in which the study was implemented.

The multilevel model of achievement in English reading in this study, as well as other similar models (e.g., Perkins et al., 2012) highlight some areas in which parents might make a difference to their child's achievement. These included encouraging their child to read for fun on at least an occasional basis, discussing what their child has read at home or at school, and monitoring their child's TV viewing, especially if there is a TV in their child's bedroom. The inclusion of number of books in the home in the model indicates that a home educational environment, in which parents discuss what their child has read at home and at school, is an important factor associated with reading performance.

A potential difficulty for some parents of pupils in Irish-medium schools is lack of experience or confidence in speaking Irish. More research is needed to look at whether the needs of these parents are being adequately met, as they interact with their child's school in relation to such areas as English reading and mathematics.

Recommendations:

20. Irish-medium schools should organise frequent information evenings designed to inform parents how to support their child's learning in the main curriculum areas. Parental attendance should be encouraged and supported.
21. Parents should be made aware of the importance of engaging their children in reading for pleasure on a consistent basis, discussing with them what they have read at home and at school, and monitoring their viewing, especially if there is a TV in their bedroom.
22. Research should be conducted by the DES and others into how parents with low levels of proficiency in Irish can be helped to provide support at home to their children who are receiving instruction through the medium of Irish at school.

Pupil Engagement

In the current study, 80% of pupils in Second class in SLG and 76% in Gaeltacht schools indicated that they liked to speak Irish at school. However, by Sixth class, these percentages had dropped to 55% and 58% respectively, indicating a poorer attitude towards speaking Irish at school among older pupils. Similar declines between Second and Sixth class were observed for attitudes towards speaking Irish at home, although the drop was much smaller among pupils in Gaeltacht schools than SLG. These outcomes may reflect the influence of the media/Internet and English-speaking peers on pupils' attitudes as they progress through their schooling. While a stronger preference for English is unlikely to have a negative impact on performance on English reading (indeed a majority of pupils in the current study at both Second and Sixth classes reported a preference for reading English texts over Irish texts), it could impact negatively on performance in mathematics, where instruction and assessment is mainly through Irish.

On measures of attitude towards use of Irish at school (Second class), engagement in Irish at home (Second) and overall engagement with Irish (Sixth), boys in SLG had significantly lower scores on all three, while Second class boys in Gaeltacht schools had a significantly lower score on attitude towards use of Irish at school. These outcomes suggest that boys' attitudes and engagement may be problematic, particularly in SLG, and might, therefore, impact negatively on their progress in subjects taught through the medium of Irish. Research into the area could have relevance for promoting positive attitudes towards Irish more generally within the education system – an aspiration in the *20 Year Strategy for the Irish Language 2010-2030* (Government of Ireland, 2010).

Recommendation:

23. Research should be conducted into how Irish-medium schools can be supported in maintaining pupils' initially positive attitudes to, and engagement with, Irish throughout the primary school years, with particular emphasis on boys.

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Appendix to Chapter 7
Understanding Performance

Table A7.1: Regression of school-average SES on school-average Sixth class reading achievement (schools with at least 15 Sixth class pupils) – NA ’09

	PE	SE	t	df	p
Intercept	128.2	11.32			
School-average SES	2.5	0.24	10.60	70	<.001

R-squared is 0.62. Regression conducted in WesVar 5.1. Data were weighted by a normalised school weight. An alternative model using a z-standardised school-average SES score has an intercept of 245.4 and a parameter estimate of 17.4 for average SES.

Table A7.2: Regression of school-average SES on school-average Sixth class mathematics achievement (schools with at least 15 Sixth class pupils) – NA ’09

	PE	SE	t	df	p
Intercept	134.9	12.99			
School average SES	2.4	0.26	9.15	70	<.001

R-squared is 0.42. Regression conducted in WesVar 5.1. Data were weighted by a normalised school weight. An alternative model using a z-standardised school-average SES score has an intercept of 245.3 and a parameter estimate of 16.4 for average SES.

Table A7.3: Multiple comparisons of differences in school-average SES in SLG and NA ’09 schools matched for SES and location (schools with at least 15 Sixth class pupils)

	SLG		NA ’09[1]	
	Mean	SE	Mean	SE
School-average SES	54.0	0.86	52.1	0.76

Comparisons	Diff	SE of diff	t	df	p
SLG – NA ’09	1.9	1.15	1.66	52	ns

Note: t value compared to a critical value of 2.007 (based on 52 degrees of freedom and one comparison)

[1]Schools where average SES is at or above the minimum found in SLG, with at least 15 Sixth class pupils and not located in rural areas

Table A7.4: Estimates of between- and within-school variance[1] in Second class reading and mathematics achievement, by school type

		SLG		Gaeltacht		NA '09	
		Variance (SE)	% of Total	Variance (SE)	% of Total	Variance (SE)	% of Total
Reading	Between-school	174.6 (49.72)	7.8	140.3 (72.11)	6.2	366.2 (56.75)	15.1
	Residual	2068.2 (72.29)	92.2	2135.2 (131.73)	93.8	2057.8 (47.83)	84.9
	Total variance	2242.76	100.0	2275.55	100.0	2424.0	100.0
Maths	Between-school	591.8 (129.9)	25.0	341.2 (110.16)	16.23	520.0 (75.14)	21.5
	Residual	1774.1 (591.8)	75.0	1760.45 (107.92)	83.77	1900.5 (43.80)	78.5
	Total variance	2365.9	100.0	2101.63	100.00	2420.5	100.0

[1]Estimated in SPSS Mixed Models, using Maximum Likelihood Estimation. Data are unweighted. Estimates are very similar to those computed in HLM using Full Maximum Likelihood.

Table A7.5: Estimates of between- and within-school variance[1] in Sixth class reading and mathematics achievement, by school type

		SLG		Gaeltacht		NA '09	
		Variance	% of Total	Variance	% of Total	Variance (SE)	% of Total
Reading	Between-school	137.3 (41.14)	6.9	128.3 (66.13)	6.4	398.8 (60.64)	15.7
	Residual	1847.8 (70.81)	93.1	1890.8 (114.65)	93.7	2147.6 (50.12)	84.3
	Total variance	1985.1	100.0	2019.1	100.0	2546.4	100.0
Maths	Between-school	352.2 (83.37)	17.0	304.8 (101.13)	15.3	576.9 (80.86)	23.2
	Residual	1715.0 (65.91)	83.0	1681.4 (101.56)	84.7	1905.5 (44.31)	76.76
	Total variance	2067.22	100.0	1986.2	100.0	2482.4	100.0

[1]Estimated in SPSS Mixed Models, using Maximum Likelihood Estimation. Data are unweighted. Estimates are very similar to those computed in HLM using Full Maximum Likelihood.

Table A7.6: School-level variables tested as separate models by addition to the null random intercept model[1] (Reading achievement, Second class, SLG)

	PE	SE	Test stat	df	p
In School Support Programme under DEIS (Yes – No)	-23.09	4.331	t=-5.333	52	<.001
School average socioeconomic status: zscore	10.63	1.638	t=6.486	52	<.001
Location					
City – Large town	15.98	5.202	Ddiff=9.725	2	<.01
Rural/small town – Large town	13.53	5.246			
Percent female enrolment	-0.30	0.571	t=-0.533	52	.596
School enrolment size: first class	0.38	0.150	t=2.569	52	.013
Language in which reading instruction is begun					
Irish – English	5.19	5.229	Ddiff=3.392	3	.335
Mix of Irish and English – English	-4.48	9.010			
Missing School Questionnaire (Yes – No)[a]	13.85	13.478			
Time of beginning English reading instruction					
Junior Infants – Senior Infants	-9.34	4.605	Ddiff=4.186	3	.2421
First class – Senior Infants	-5.03	7.695			
Missing indicator (Yes – No)[a]	-8.20	11.819			
Proportion of female teachers	8.82	4.253	t=2.074	52	.43
Permanent teaching staff					
Proportion of pupils with permanent teachers	-4.26	5.390	Ddiff=0.449	2	.7988
Missing indicator[b]	-5.48	13.754			
Average teacher experience					
Teacher experience	-0.43	0.246	Ddiff=3.079	2	.2145
Missing indicator[b]	-6.80	7.290			
Average class-size					
Class-size	0.02	0.576	Ddiff=.020	2	.99
Missing indicator[b]	-2.12	13.137			
Extra teaching qualifications					
Proportion of pupils with teachers with extra qualifications	2.75	5.070	Ddiff=0.336	2	.8451
Missing indicator[b]	-0.68	13.488			
Time spent on English					
Minutes per week	0.00	0.033	Ddiff=.027	2	.9868
Missing indicator[b]	-2.16	13.102			
Frequency of pupils reading books of own choosing in English class					
Every or most days – Few times per month or less	5.11	5.654	Ddiff=1.046	2	.5929
Missing indicator[b]	0.84	13.340			
Computer in classroom					
Proportion of pupils with computer in classroom	4.46	5.354	Ddiff=2.006	2	.3667
Missing indicator[b]	-7.65	9.717			
Books in the classroom					
Average number of books	.00	.008	Ddiff=2.517	2	.284
Missing indicator[b]	-14.52	8.395			

[1]Missing indicators used initially in order to conserve as many cases as possible. Once model was finalised, it was re-run, excluding cases which were missing data. Variables in grey remain in final model.

[a]Missing indicator = 1: all pupils in school missing data on this variable; 0 otherwise.

[b]Teacher data aggregated to school level from pupil level. Missing indicator computed at pupil level, then aggregated to examine how many schools had teacher data for one but not all classes. Missing indicator = 0: no pupils in school are missing data on variable. Missing indicator = 1: all pupils in school missing data on variable. In one school, missing indicator has value other than zero/one representing proportion of pupils missing teacher data. Final model excludes missing indicators, without any large change in parameter estimates, thus interpretation of PE for missing indicators not of substantive importance.

Table A7.7: Pupil-level variables tested as separate models by addition to the null random intercept model (Reading achievement, Second class, SLG)

	PE	SE	Test stat	df	p
Gender (Female – Male)	4.85	2.268	t=2.137	1493	<.001
Siblings					
No siblings – 1 sibling	4.69	5.056	Ddiff=6.634	3	.0845
Two siblings – 1 sibling	2.88	3.260			
Three or more – 1 sibling	-4.48	3.580			
Single parent family (Yes – No)	-12.31	3.266	t=-3.771	193	<.001
Socioeconomic status					
Zscore	10.29	1.111	Ddiff=79.198	2	<.001
Missing indicator (Yes – No)	-9.03	6.765			
At least one parent works full-time (Yes – No)	12.48	3.684	t=3.3868	1493	.001
TV in bedroom					
Pupil has TV (Yes – No)	-24.42	2.260	Ddiff=102.27	2	<.001
Missing indicator (Yes – No)	-23.22	6.340			
Leisure reading (pupil)					
Pupil reads for fun (Yes – No)	12.15	2.905	Ddiff=19.817	2	<.001
Missing indicator (Yes – No)	5.64	5.252			
Time on English homework: zscore	-6.29	1.574	t=-3.993	1493	<.001
Books at home	13.40	1.356	t=9.878	1493	<.001
Leisure reading (parent)					
At least one parent reads a book regularly – now and then	5.95	3.763	Ddiff=9.385	2	<.01
At least one parent reads a book seldom – now and then	-14.79	7.786			
Home Educational Resources					
One – Two	-4.84	3.289	Ddiff=13.805	2	<.01
Zero – Two	-20.77	5.667			
Extra classes (like music, dance or art) outside of school					
Yes – No	3.72	2.538	Ddiff=6.519	2	<.05
Missing indicator (Yes – No)	-9.38	6.805			

[1]Variables in grey remain in final model.

Table A7.8: Percentage of variance in Second class reading in SLG explained by combinations of variable blocks[1]

Blocks added one by one to null model[1]	Between-schools	Within-schools	Total
Block 1. School characteristics[a]	26.77	-0.14	1.65
Block 2. Teacher characteristics[b]	–	–	–
Block 3. Pupil socioeconomic status[c]	42.87	4.31	6.86
Block 4. Home climate[d]	49.13	15.80	18.00
Block 1+2+3+4	66.73	16.42	19.75

[1]Variance explained calculated on the basis of the final model compared to the null model, computed using the same subset of cases as the fitted model.

[a]School enrolment size at First class;

[b]No variables from this block were retained in the final model;

[c]Pupil socioeconomic status;

[d]Pupil has TV in bedroom, pupil sometimes reads a book, magazine or comic for fun before or after school, time spent on English homework (reported by parent) and squared term, English and Irish books at home.