

PHOTO REDACTED DUE TO THIRD PARTY RIGHTS OR OTHER LEGAL ISSUES

ISSN 2049-8942

RB 4/2012

December 2012

## PIRLS 2011 and TIMSS 2011

### Achievement of Year 6 Pupils in Northern Ireland

The 2011 Progress in International Reading Literacy Study (PIRLS) is an international comparison study of reading achievement at ages 9-10 and the 2011 Trends in International Mathematics and Science Study (TIMSS) is a parallel study of mathematics and science at ages 9-10 (and ages 13-14, although NI participated only at the younger age range).

#### Key Findings

- In reading, NI pupils were ranked 5<sup>th</sup> out of the 45 participating countries. Pupils in NI significantly<sup>1</sup> outperformed pupils in 36 of the countries that participated in PIRLS 2011. NI was the highest ranking English speaking country.
- NI pupils were ranked 6<sup>th</sup> in mathematics, significantly outperforming pupils in 44 of the 50 countries that participated in TIMSS 2011. NI was the highest performing English speaking country.

---

<sup>1</sup> Throughout this summary, the term 'significant' refers to statistical significance.

- The average score for NI pupils in science was lower than for reading and mathematics, although still significantly above the TIMSS science international average. NI pupils outperformed pupils in 23 countries and were outperformed by pupils in 17 countries in science.
- Nineteen per cent (19%) of pupils in NI reached the 'Advanced' benchmark in reading, substantially higher than the international median of 8%. Only Singapore (24%) had a larger proportion of its pupils reaching the Advanced benchmark.
- Twenty-four per cent (24%) of pupils in NI reached the 'Advanced' benchmark in mathematics. Only 5 countries had a larger proportion of their pupils reaching this benchmark. The international median for the Advanced benchmark was 4%.

### **Pupils' engagement**

- Pupils in NI who were categorised as liking, 'motivated to' or 'confident in' reading, learning mathematics or learning science were more likely to have higher average achievement scores but there was no association between pupil engagement and achievement levels.
- A higher proportion of pupils reported that they did not like reading (20%) or learning mathematics (26%) compared with their international counterparts (15% and 16% respectively).

### **School resources**

- Teachers in NI rated their working conditions relatively highly compared with international averages. Eighty-four per cent (84%) reported 'hardly any' or 'minor' problems compared with the international average of 73%.
- A lower proportion of school principals reported that teaching was 'affected a lot' by resource shortages than their international counterparts.
- NI had one of the highest levels of computer provision among all participating countries with over three quarters of pupils taught in schools where a computer was available for every 1 to 2 pupils.
- Thirty-one per cent (31%) of pupils attended schools that had no school library but 97% of pupils had a class library, often of 50 books or more.

## **The school learning environment**

- Principals and teachers in NI reported the highest levels of emphasis on academic success: no other participating country had higher overall averages on this scale.
- NI had the highest proportion of schools that were categorised as safe and orderly and one of the highest levels for discipline and safety. These factors appear to relate to higher pupil attainment.
- Pupils reported relatively low levels of bullying and teachers reported that their teaching was rarely limited by disruptive or uninterested pupils.
- Around 95% of teachers in NI reported that they were 'satisfied' or 'somewhat satisfied' with their careers.

## **The curriculum and learning activities**

- Teaching time for English and mathematics was higher than the international average. In contrast, teaching time for science was lower than the international average.
- A small proportion (13%) of Year 6 pupils were taught science by teachers who reported emphasising science investigation in at least half their lessons; considerably below the international average of 40%.

## **Characteristics of pupils and their homes**

- A higher proportion of children in NI reported having many resources for learning at home compared with the average internationally. Pupils with access to more home resources for learning had higher average achievement in reading, mathematics and science.
- The proportion of pupils whose teachers reported lack of sleep as a limiting factor was greater in NI than the international average in all 3 subjects.
- Pupils in NI whose teachers reported that pupils' lack of basic nutrition and lack of sufficient sleep limited teaching had lower average achievement than those pupils whose teachers reported not having these limitations.

## BACKGROUND

1. PIRLS is an international comparison study of reading achievement at ages 9-10 and TIMSS is a parallel study of mathematics and science at ages 9-10 (and ages 13-14, although NI participated only at the younger age range). PIRLS and TIMSS are projects of the International Association for the Evaluation of Educational Achievement (IEA) and are directed by the TIMSS and PIRLS International Study Center at Boston College.
2. PIRLS has a five-yearly cycle and TIMSS a four-yearly cycle. 2011 was the first year in which the cycles of the two studies coincided, allowing the opportunity to assess the same pupils at ages 9-10 in all three subject domains. NI took part in PIRLS and TIMSS for the first time in the 2011 cycle.
3. At the aged 9-10 element of the studies, 45 countries took part in PIRLS 2011 and 50 countries took part in TIMSS 2011. Twenty-four (24) of the 34 OECD countries took part in PIRLS and 25 took part in TIMSS. Of the 27 EU member countries, 21 took part in PIRLS 2011 and 18 took part in TIMSS 2011.
4. The fieldwork for the studies took place in May/June 2011 and involved 3,586 pupils in 136 primary schools.
5. Both PIRLS and TIMSS are subject to strict school and pupil sampling techniques that are designed to ensure the results of the surveys accurately represent the school and pupil population from which the sample is drawn. More information on sample design and methodology can be found here [http://timssandpirls.bc.edu/methods/pdf/TP\\_Sampling\\_Design.pdf](http://timssandpirls.bc.edu/methods/pdf/TP_Sampling_Design.pdf)
6. Further information on PIRLS 2011 and the NI report can be found here [www.nfer.ac.uk/pirls](http://www.nfer.ac.uk/pirls)  
Further information on TIMSS 2011 and the NI report can be found here [www.nfer.ac.uk/timss](http://www.nfer.ac.uk/timss)
7. PIRLS 2011 International Results in Reading report can be found here <http://timssandpirls.bc.edu/pirls2011/reports/international-results-pirls.html>  
TIMSS 2011 International Results in Mathematics report can be found here <http://timssandpirls.bc.edu/timss2011/reports/international-results-mathematics.html>  
TIMSS 2011 International Results in Science report can be found here <http://timssandpirls.bc.edu/timss2011/reports/international-results-science.html>

## **Achievement**

Pupils in NI achieved a mean score of 558 in reading, significantly above the international average of 500. Only 4 of the 45 participating countries had mean scores that were significantly higher than NI and these were Hong Kong, Russian Federation, Finland and Singapore. NI performance was similar to a further 4 countries (United States, Denmark, Croatia and Chinese Taipei) and was significantly higher than all other participating countries. (Table 1)

Pupils in NI achieved a mean score of 562 in mathematics, significantly above the international average of 500. Only 5 of the 50 participating countries had mean scores that were significantly higher than NI and these were Singapore, Republic of Korea, Hong Kong, Chinese Taipei and Japan. NI performance was significantly higher than all other participating countries. (Table 2)

In science, pupils in NI achieved a mean score of 517 and this was significantly above the international average of 500. Seventeen (17) of the 50 participating countries had mean scores that were significantly higher than NI, a further 9 had scores that were not significantly different to NI and the remaining 23 countries had significantly lower mean scores than NI. (Table 3)

## **Distribution of Attainment**

International benchmarks are set at Advanced, High, Intermediate and Low. In reading, at the Advanced level, only 1 country (Singapore) had a higher proportion of their pupils (24%) than NI (19%) performing at this level. The international median at the Advanced level was 8%. Only 3% of NI pupils' performance was below the low international benchmark.

Twenty-four per cent (24%) of pupils in NI reached the Advanced International benchmark in mathematics. This was exceeded by only 5 countries (Singapore, Republic of Korea, Hong Kong, Chinese Taipei and Japan). The international median at the Advanced level was 4%. Only 4% of NI pupils' performed below the low international benchmark.

Five per cent (5%) of pupils in NI reached the Advanced International benchmark in science. Twenty four (24) of the other participating countries had a higher proportion of their pupils reaching this level. The international median at the Advanced level was 5%. Only 6% of NI pupils' performance was below the low international benchmark.

## Gender

In reading, girls scores (567) were significantly higher than boys scores (550) but there was no significant gender difference for mathematics or science. This was in keeping with the international position where there was a 16 scale point difference between girls and boys in reading (in favour of girls) and no significance difference in mathematics or science.

## Pupils' attitudes to reading, learning mathematics and learning science

Twenty-nine per cent (29%), 36% and 51% of pupils in NI were reported to like reading, like learning mathematics and like learning science respectively. These proportions were similar to the international averages for liking reading and learning science but lower than the international average for liking learning mathematics. Higher achievement scores were associated with NI pupils who liked reading (590), learning mathematics (576) and learning science (533) than those pupils who were reported to not like the subjects (527, 546 and 483 respectively). A higher proportion of pupils in NI than internationally reported that they did not like reading (NI 20%, International 15%) or learning mathematics (NI 26%, International 16%).

Sixty-five per cent (65%) of pupils in NI were reported as being motivated to read. The equivalent international average was 74%. Internationally, higher levels of achievement in reading were associated with higher levels of motivation with 'Motivated' pupils achieving an average of 518, 'Somewhat motivated' pupils achieving 503 and 'Not motivated' pupils achieving 474. The achievement rates in NI showed a different pattern with scores of 561, 561 and 533 in the 3 categories respectively.

Similar proportions of pupils in NI to the international average were reported as being 'Confident' in reading (35% and 36% respectively) and mathematics (35% and 34% respectively) but this proportion was lower than the international average in science (37% and 43% respectively). As with those pupils who 'liked' a subject, higher levels of achievement were associated with pupils who were confident in a subject (591, 598 and 537 respectively for reading, mathematics and science) than for those who were not confident (501, 519, 482 respectively).

Slightly lower proportions of pupils in NI than internationally were reported as being 'engaged' in reading lessons (NI 37%, International 42%). Internationally, there was a significant negative association between reported levels of engagement and a country's overall achievement in reading. In contrast to the international average,

there was no association between engagement and achievement in NI. While internationally the data suggests a trend that higher levels of engagement are associated with higher achievement for mathematics and science, this does not appear to be the case in NI where the relationship was unclear.

## **School Resources**

### **Working conditions**

A higher proportion of pupils in NI than internationally were taught by teachers who reported they had 'hardly any problems' or 'minor problems' with their working conditions in terms of teaching space, teaching materials and supplies. These proportions were similar across all 3 subjects in NI (84%) and internationally (73%).

Twenty-eight per cent (28%), 29% and 23% of pupils were taught in schools where the principal reported that teaching was not affected by resource shortages in reading, mathematics and science respectively. Lower proportions of pupils were in schools in NI where the principal reported that teaching was 'affected a lot' by resource shortages (NI - reading 1%, mathematics 1%, science 3%/international - reading 5%, mathematics 5%, science 7%).

Just under a third of pupils (31%) were in schools where principals reported that they did not have a school library. This was higher than the international average of 14%. However, almost all pupils (97%) were taught by teachers who reported that they had a classroom library.

All pupils in NI have access to a computer in school with over three quarters having 1 computer available for 1 to 2 pupils across all 3 subjects (reading - 76%, mathematics - 77%, science - 77%). This was higher than the international average of 40%, 38% and 38% respectively.

### **School learning environment**

NI had the highest proportion of pupils (33%) of all participating countries taught in schools where the principal and teachers reported that their school had a very high emphasis on academic success across all 3 subjects. The international average was around 8%.

NI had the highest proportion of all participating countries for pupils being taught in safe and orderly schools in both mathematics (85%) and science (85%) and

was second on the international reading (84%) table. None of the teachers in NI reported that their school was 'not safe and orderly'. In NI, higher pupil attainment is associated with safe and orderly schools.

The majority (85%) of pupils were taught in schools whose principal reported that they had 'hardly any problems' with discipline and safety in their schools across all 3 subjects. Only Hong Kong (87%) had a higher proportion of their pupils in this category for reading while only Kazakhstan (91%) and Armenia (87%) reported fewer problems for mathematics and science than NI.

Pupils in NI were less likely to experience bullying behaviours than their international counterparts with 57% reporting that they were almost never bullied, compared with around 48% internationally.

Pupils in NI were less likely to have their lessons affected by disruptive or uninterested pupils than the international average. Only 5% of pupils were taught by teachers who reported that their teaching was affected 'a lot' by uninterested pupils (internationally the figure was 13%). Similarly, only 2% of pupils were taught by teachers who reported that their teaching was affected 'a lot' by disruptive pupils (internationally the figure was 11%).

Around 95% of teachers reported that they were satisfied or somewhat satisfied with their careers. This international average was also 95%. Pupil attainment does not appear to be associated with the level of teacher career satisfaction.

### **Curriculum and learning activities**

Pupils in NI spend more time on language instruction (274 of 970 available teaching hours) and mathematics (232 of 970 available teaching hours) than their international counterparts (232 of 905 hours and 162 of 897 hours respectively). The converse is true of science where 72 of the 970 hours of available teaching is spent on science instruction, lower than the international average of 85 of the 897 teaching hours spent on science instruction.

A much lower proportion of pupils in NI (13%) were taught by teachers who reported emphasizing science investigation in 'about half the lessons or more' than internationally (40%).

Internationally, the overall average achievement scores in reading suggest that the early teaching of a range of reading skills and strategies is associated with higher

reading achievement. However, in NI achievement was similar regardless of the age at which these reading skills were first emphasized.

Higher proportions of pupils in NI than internationally were taught by teachers who reported that they had computers available to them for reading (65%), mathematics (76%) and science (78%). The comparable figures internationally were reading (45%), mathematics (42%) and science (47%). As with the international average, there was no association between levels of attainment and the availability of computers to teachers for lessons.

### **Characteristics of pupils and their homes**

A higher proportion of pupils in NI (30%) than internationally (18%) reported that they had access to many resources for learning at home. Seventy per cent of pupils in NI had their own room and internet connection in their home compared with the international figures of 55% (reading) and 52% for both mathematics and science. Higher attainment is associated with higher levels of available resources.

Lower proportions of NI pupils (20% reading, 19% mathematics, 20% science) were reported by their teachers as being affected by a lack of basic nutrition. The comparable international figures were 27%, 29% and 29% respectively. Conversely, higher proportions of pupils (60% reading, 59% mathematics, 61% science) were reported by their teachers as being affected by a lack of sleep. The comparable international figures were 49%, 47% and 46% respectively.

A lower proportion of pupils in NI were reported by their teachers as lacking prerequisite knowledge and skills in reading, mathematics or science with only 6% reporting that their instruction was limited 'a lot' in each of the 3 subjects. Internationally the figures were 11%, 12% and 11% respectively. While lower attainment appears to be associated with a lack of prerequisite skills internationally, this does not appear to be the case in NI.

**Table 1: Achievement in reading**

Countries (and their scale scores) where performance in reading was significantly higher than NI		Countries (and their scale scores) where performance in reading was not significantly different to NI		Countries (and their scale scores) where performance in reading was significantly lower than NI	
4 countries		5 countries (inc NI)		36 countries	
Hong Kong	571	NI	558	Ireland	552
Russian Federation	568	United States	556	England	552
Finland	568	Denmark	554	Canada	548
Singapore	567	Croatia	553	Netherlands	546
		Chinese Taipei	553	Czech Republic	545
				Sweden	542
				Italy	541
				Germany	541
				Israel	541
				Portugal	541
				Hungary	539
				Slovak Republic	535
				Bulgaria	532
				New Zealand	531
				Slovenia	530
				Austria	529
				Lithuania	528
				Australia	527
				Poland	526
				France	520
				Spain	513
				Norway	507
				Belgium (French)	506
				Romania	502
				Georgia	488
				Malta	477
				Trinidad and Tobago	471
				Azerbaijan	462
				Islamic Republic of Iran	457
				Colombia	448
				United Arab Emirates	439
				Saudi Arabia	430
				Indonesia	428
				Qatar	425
				Oman	391
				Morocco	310

**Table 2: Achievement in mathematics**

Countries (and their scale scores) where performance in mathematics was significantly higher than NI	Countries (and their scale scores) where performance in mathematics was not significantly different to NI	Countries (and their scale scores) where performance in mathematics was significantly lower than NI
<b>5 countries</b>	<b>1 country (inc NI)</b>	<b>44 countries</b>
Singapore 606 Korea 605 Hong Kong 602 Chinese Taipei 591 Japan 585	NI 562	Belgium (Flemish) 549 Finland 545 England 542 Russian Federation 542 United States 541 Netherlands 540 Denmark 537 Lithuania 534 Portugal 532 Germany 528 Ireland 527 Serbia 516 Australia 516 Hungary 515 Slovenia 513 Czech Republic 511 Austria 508 Italy 508 Slovak Republic 507 Sweden 504 Kazakhstan 501 Malta 496 Norway 495 Croatia 490 New Zealand 486 Spain 482 Romania 482 Poland 481 Turkey 469 Azerbaijan 463 Chile 462 Thailand 458 Armenia 452 Georgia 450 Bahrain 436 United Arab Emirates 434 Islamic Republic of Iran 431 Qatar 413 Saudi Arabia 410 Oman 385 Tunisia 359 Kuwait 342 Morocco 335 Yemen 248

**Table 3: Achievement in science**

Countries (and their scale scores) where performance in science was significantly higher than NI	Countries (and their scale scores) where performance in science was not significantly different to NI	Countries (and their scale scores) where performance in science was significantly lower than NI
<b>17 countries</b>	<b>10 countries (inc NI)</b>	<b>23 countries</b>
Korea 587 Singapore 583 Finland 570 Japan 559 Russian Federation 552 Chinese Taipei 552 United States 544 Czech Republic 536 Hong Kong 535 Hungary 534 Sweden 533 Slovak Republic 532 Austria 532 Netherlands 531 England 529 Denmark 528 Germany 528	Italy 524 Portugal 522 Slovenia 520 NI 517 Ireland 516 Croatia 516 Australia 516 Serbia 516 Lithuania 515 Romania 505	Belgium (Flemish) 509 Spain 505 Poland 505 New Zealand 497 Kazakhstan 495 Norway 494 Chile 480 Thailand 472 Turkey 463 Georgia 455 Islamic Republic of Iran 453 Bahrain 449 Malta 446 Azerbaijan 438 Saudi Arabia 429 United Arab Emirates 428 Armenia 416 Qatar 394 Oman 377 Kuwait 347 Tunisia 346 Morocco 264 Yemen 209

## **DEPARTMENT OF EDUCATION RESEARCH BRIEFINGS (2000 TO DATE)**

Three years later: a follow-up survey of teachers who qualified in 1995	RB 1/2000
Immersion education: a literature review	RB 2/2000
From pre-school to school: a review of the research literature	RB 3/2000
The effects of the selective system of secondary education in Northern Ireland	RB 4/2000
Department of Education funded research 2000/01	RB 1/2001
Assessment of the effectiveness of the Youth Service Community Relations Support Scheme (YSCRSS) during 1998/1999 and 1999/2000, in relation to the needs of youth and community groups	RB 2/2001
An investigation of the provision for health education in schools during 1998/99	RB 3/2001
Careers provision in schools at Key Stages 3 and 4	RB 1/2002
Evaluation of Raising School Standards Initiative (RSSI) using Value Added measures of school performance	RB 2/2002
Literature review: effectiveness of different forms of interventions in the schools and youth sectors	RB 3/2002
Outcomes for pupils who received an Irish-Medium education	RB 4/2002
Multiply-suspended pupils: their educational career and support projects available to them	RB 5/2002
Reducing the bureaucratic burden on schools	RB 6/2002
Developing linguistic accuracy in Irish-Medium primary schools	RB 7/2002
Bullying in schools: a Northern Ireland study	RB 8/2002
Community use of schools: an international literature review	RB 1/2003

Department of Education Funded Research 2002/03	RB 2/2003
The Education Experience of Young People in Juvenile Justice Centres A Study of Careers Education and Guidance	RB 1/2004
Out of School Hours Learning Provision and School Improvement in Northern Ireland	RB 2/2004
The Professional Development of Teachers and Principals in Irish-Medium Education	RB 3/2004
Traveller children's experiences in mainstream post-primary schools in Northern Ireland: a qualitative study	RB 1/2005
The nature of Youth Work in Northern Ireland: purpose, contribution and challenges	RB 2/2005
Parental attitudes to the statutory assessment and statementing procedures on Special Educational Needs	RB 3/2005
A study into current practice and potential models for the effective teaching of Personal Development at Key Stage 3 in Northern Ireland curriculum	RB 4/2005
Language Development Programmes - coverage and effectiveness of Provision in Northern Ireland (0-36 months)	RB 1/2006
Attitudes of the Socially Disadvantaged towards Education in Northern Ireland	RB 2/2006
Effective Pre-school Provision in Northern Ireland (EPPNI)	RB 3/2006
The Development of Inclusive Schools in Northern Ireland: A Model of Best Practice	RB 4/2006
Department of Education Funded Research 2005/06	RB 5/2006
The recruitment and retention of teachers in post-primary schools in Northern Ireland	RB 6/2006
An evaluation of the need and early intervention support for children (aged 2-4 years) with an Autistic Spectrum Disorder in Northern Ireland	RB 1/2007

Alternative Education Provision (AEP) in Northern Ireland	RB 2/2007
The Nature and Extent of Bullying in Schools in the North of Ireland	RB 3/2007
Department of Education Funded Research 2006/07	RB 4/2007
An investigation of youth work, as a process of informal learning, in formal settings	RB 1/2008
E-Consultation with pupils - A pilot study	RB 2/2008
Good practice in literacy and numeracy in British and Irish cities	RB 3/2008
Department of Education Funded Research 2008/09	RB 1/2009
The Special Education Needs of Bilingual (Irish-English) Children	RB 2/2009
Audit of Counselling and Therapeutic Interventions in Primary schools and Special Schools in the North of Ireland	RB 3/2009
Effective Pre School Provision in Northern Ireland (EPPNI) Pre-School Experience and Key Stage 2 Performance in English and Mathematics	RB 1/2010
School governors: the guardians of our schools	RB 2/2010
PISA 2009: Achievement of 15-year olds in Northern Ireland	RB 3/2010
Study into how the education system can improve the attendance of looked after children at post-primary school	RB 1/2011
Research into the Nature and Extent of Pupil Bullying in Schools in the North of Ireland	RB 2/2011
Needs assessment and feasibility study for the development of high level diagnostic tools in Irish for children with special educational needs in the Irish medium sector	RB 1/2012
Research into Improving Attendance in Schools Serving Deprived Areas	RB 2/2012
Taking Boys Seriously: A Longitudinal Study of Adolescent Male School-Life Experiences in Northern Ireland	RB 3/2012

## **PURPOSE OF DEPARTMENT OF EDUCATION RESEARCH BRIEFINGS**

The Department of Education (DE) places a high value on the wide circulation of research results to ensure that research has the maximum impact on policy and practice in education. DE Research Briefings are designed to provide attractive, interesting and easy access to research findings for policy makers, researchers, teachers, lecturers, employers and the public to facilitate informed discussion of education issues. Research cannot make decisions for policy makers and others concerned with improving the quality of education. Nor can it by itself bring about change. But it can create a better basis for decisions, by providing information and explanation about educational practice and by clarifying and challenging ideas and assumptions.

**The full range of DE Research Briefings can be accessed at the DE Internet site - [http://www.deni.gov.uk/index/facts-and-figures-new/32\\_statistics\\_and\\_research-research\\_pg.htm](http://www.deni.gov.uk/index/facts-and-figures-new/32_statistics_and_research-research_pg.htm)**

DE Research Briefings may be photocopied for use within your own institution.

If you have difficulty getting access to DE Research on the DE website please contact us at:

Statistics and Research Team  
Department of Education  
Rathgael House  
43 Balloo Road  
Rathgill  
BANGOR  
Co Down  
BT19 7PR

Telephone: 028 9127 9401

Fax: 028 9127 9594

e-mail: [statistics@deni.gov.uk](mailto:statistics@deni.gov.uk)

**Edited and produced by Statistics and Research Team.**