

## 2 Attainment in TIMSS 2015 by gender

### Chapter outline

This chapter summarises pupils' attainment by gender in mathematics and science in Year 6 (Y6, ages 9-10) in 2015. Findings for mathematics are discussed first, followed by findings for science. Outcomes for Northern Ireland are compared with those of the subset of main comparator nations which performed better than Northern Ireland in PISA 2012 in all three domains (Australia, Finland, Hong Kong, Poland, the Republic of Ireland, and Singapore), plus England as a comparator nation of the UK..

### Key findings

- In Northern Ireland, there were no significant<sup>11</sup> gender differences in attainment for either mathematics or science.
- The lack of gender differences in attainment in Northern Ireland in both mathematics and science was apparent in both the 2011 and 2015 TIMSS cycles.

### 2.1 Attainment by gender in TIMSS

Tables 2.1 and 2.2 below show the international average scale scores for mathematics and science, ordered by the size of gender differences. The countries at the top of the tables have gender differences favouring girls, while those at the bottom of the tables have gender differences favouring boys. Countries towards the middle of the tables have smaller gender differences than those at either end of the tables. Outcomes for Northern Ireland are discussed for each subject in turn.

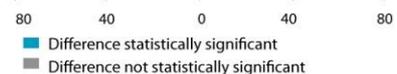
### Interpreting the data: gender differences

The TIMSS achievement scales have a centre point of 500 and a standard deviation of 100. The tables show the direction and size of any gender difference for each country. Statistically significant differences are shown in colour in the 'Gender Difference' column while non-significant differences are greyed out.

<sup>11</sup> Throughout this report, the term 'significant' refers to statistical significance.

**Table 2.1 TIMSS 2015 gender differences, mathematics at ages 9-10**

Country	Girls		Boys		Difference (Absolute Value)	Gender Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
ψ Saudi Arabia	49 (1.0)	405 (4.4)	51 (1.0)	363 (6.5)	43 (7.7)		
Oman	50 (0.7)	436 (3.0)	50 (0.7)	415 (2.8)	22 (2.9)		
Jordan	46 (2.4)	399 (3.3)	54 (2.4)	379 (4.9)	20 (5.8)		
South Africa (5)	48 (0.8)	384 (3.8)	52 (0.8)	368 (4.4)	15 (4.2)		
<sup>2</sup> Bahrain	50 (0.7)	459 (1.7)	50 (0.7)	443 (2.3)	15 (2.5)		
ψ Kuwait	51 (2.0)	359 (5.4)	49 (2.0)	347 (5.6)	12 (6.2)		
Iran, Islamic Rep. of	50 (0.9)	437 (4.5)	50 (0.9)	426 (4.5)	10 (6.3)		
Indonesia	48 (0.6)	403 (4.0)	52 (0.6)	393 (3.9)	10 (2.7)		
Finland	48 (0.8)	540 (2.3)	52 (0.8)	531 (2.6)	9 (2.9)		
Bulgaria	49 (0.8)	527 (5.7)	51 (0.8)	522 (5.1)	5 (2.9)		
Norway (5)	49 (0.9)	551 (2.6)	51 (0.9)	547 (3.1)	4 (2.9)		
<sup>2</sup> Singapore	48 (0.5)	620 (3.9)	52 (0.5)	616 (4.3)	4 (3.0)		
United Arab Emirates	48 (2.2)	453 (3.9)	52 (2.2)	450 (3.4)	3 (5.4)		
<sup>1</sup> Georgia	49 (0.9)	465 (3.9)	51 (0.9)	461 (4.4)	3 (4.0)		
<sup>3</sup> Serbia	48 (0.8)	520 (3.7)	52 (0.8)	517 (4.7)	3 (4.7)		
Qatar	51 (2.5)	440 (4.1)	49 (2.5)	438 (4.9)	3 (5.9)		
<sup>2</sup> Lithuania	50 (0.9)	537 (2.8)	50 (0.9)	534 (3.1)	2 (3.3)		
Kazakhstan	49 (0.8)	546 (4.6)	51 (0.8)	543 (4.8)	2 (2.8)		
Morocco	48 (0.7)	378 (3.5)	52 (0.7)	377 (3.9)	1 (2.8)		
<sup>2</sup> Sweden	49 (1.0)	519 (3.2)	51 (1.0)	518 (3.2)	1 (3.0)		
Russian Federation	49 (0.9)	564 (3.7)	51 (0.9)	564 (3.7)	1 (2.8)		
Japan	50 (0.5)	593 (2.0)	50 (0.5)	593 (2.5)	0 (2.3)		
Chile	49 (1.7)	458 (2.8)	51 (1.7)	459 (3.0)	1 (3.2)		
Poland	50 (0.8)	534 (2.3)	50 (0.8)	536 (2.7)	1 (2.5)		
Turkey	49 (0.6)	482 (3.2)	51 (0.6)	484 (3.5)	2 (2.7)		
‡ Northern Ireland	50 (1.1)	569 (3.8)	50 (1.1)	571 (3.1)	2 (3.8)		
New Zealand	49 (0.7)	489 (2.8)	51 (0.7)	492 (2.6)	2 (2.8)		
Germany	48 (0.7)	520 (2.4)	52 (0.7)	523 (2.3)	3 (2.3)		
Ireland, Rep. of	47 (1.5)	545 (2.6)	53 (1.5)	549 (2.9)	4 (3.4)		
Slovenia	49 (0.8)	518 (2.1)	51 (0.8)	522 (2.4)	4 (2.6)		
Chinese Taipei	49 (0.6)	594 (2.2)	51 (0.6)	599 (2.3)	6 (2.5)		
† Belgium (Flemish)	50 (0.9)	543 (2.4)	50 (0.9)	549 (2.4)	6 (2.4)		
Hungary	49 (0.9)	526 (3.4)	51 (0.9)	532 (3.8)	6 (3.4)		
France	49 (0.7)	485 (3.2)	51 (0.7)	491 (3.2)	6 (2.8)		
<sup>2</sup> † Denmark	49 (0.8)	536 (3.1)	51 (0.8)	542 (3.0)	6 (2.8)		
England	51 (0.7)	543 (3.0)	49 (0.7)	549 (3.3)	6 (2.9)		
Cyprus	49 (0.7)	520 (2.9)	51 (0.7)	526 (3.1)	6 (2.7)		
<sup>2</sup> † United States	51 (0.6)	536 (2.3)	49 (0.6)	543 (2.6)	7 (1.9)		
Czech Republic	49 (0.9)	525 (3.0)	51 (0.9)	532 (2.5)	7 (3.2)		
Korea, Rep. of	48 (0.5)	604 (2.3)	52 (0.5)	612 (2.5)	7 (1.9)		
† Netherlands	50 (0.9)	526 (1.8)	50 (0.9)	534 (2.2)	8 (2.2)		
Australia	49 (1.0)	513 (3.1)	51 (1.0)	522 (3.9)	9 (3.5)		
<sup>12</sup> † Canada	49 (0.5)	506 (2.5)	51 (0.5)	515 (2.6)	9 (2.1)		
† Hong Kong SAR	46 (1.5)	609 (3.8)	54 (1.5)	619 (2.8)	10 (3.3)		
<sup>2</sup> Portugal	49 (0.8)	536 (2.4)	51 (0.8)	547 (2.5)	11 (2.2)		
Slovak Republic	48 (0.9)	493 (3.0)	52 (0.9)	504 (2.6)	11 (2.6)		
<sup>2</sup> Spain	49 (0.9)	499 (2.7)	51 (0.9)	511 (2.7)	12 (2.4)		
Croatia	49 (0.8)	496 (2.1)	51 (0.8)	508 (2.3)	12 (2.7)		
<sup>2</sup> Italy	49 (0.7)	497 (2.7)	51 (0.7)	517 (3.0)	20 (2.7)		
International Avg.	49 (0.2)	505 (0.5)	51 (0.2)	505 (0.5)			

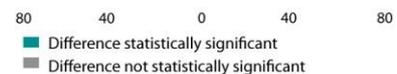


ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.  
 See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and †.  
 ( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Source: Exhibit 1.10, International mathematics report (Mullis *et al.*, 2016a).

**Table 2.2 TIMSS 2015 gender differences, science at ages 9-10**

Country	Girls		Boys		Difference (Absolute Value)	Gender Difference	
	Percent of Students	Average Scale Score	Percent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
Saudi Arabia	49 (1.0)	431 (5.3)	51 (1.0)	352 (7.6)	79 (9.0)		
<sup>2</sup> Bahrain	50 (0.8)	478 (3.0)	50 (0.8)	439 (3.5)	39 (4.0)		
Oman	50 (0.7)	447 (3.4)	50 (0.7)	415 (3.6)	32 (3.1)		
<sup>ψ</sup> Kuwait	51 (2.1)	352 (7.6)	49 (2.1)	322 (7.6)	30 (9.1)		
Qatar	51 (2.5)	448 (4.7)	49 (2.5)	424 (6.0)	24 (7.2)		
United Arab Emirates	48 (2.2)	459 (4.4)	52 (2.2)	444 (4.0)	14 (6.4)		
Finland	48 (0.8)	560 (2.3)	52 (0.8)	548 (2.9)	12 (2.5)		
Iran, Islamic Rep. of	49 (1.1)	427 (5.2)	51 (1.1)	415 (5.6)	11 (7.4)		
<sup>ψ</sup> Morocco	48 (0.8)	358 (4.7)	52 (0.8)	347 (5.7)	10 (4.9)		
Bulgaria	49 (0.8)	540 (6.3)	51 (0.8)	532 (5.9)	8 (2.9)		
<sup>2</sup> Sweden	49 (1.0)	544 (4.1)	51 (1.0)	536 (3.5)	8 (2.7)		
Indonesia	48 (0.7)	401 (5.2)	52 (0.7)	393 (5.3)	8 (4.2)		
Kazakhstan	49 (0.8)	552 (4.5)	51 (0.8)	547 (4.7)	5 (2.7)		
<sup>1</sup> Georgia	49 (0.9)	453 (3.9)	51 (0.9)	449 (4.6)	4 (4.1)		
New Zealand	49 (0.7)	507 (3.2)	51 (0.7)	504 (3.0)	3 (3.1)		
<sup>2</sup> Lithuania	50 (0.9)	529 (2.9)	50 (0.9)	526 (3.1)	3 (3.4)		
<sup>3</sup> Serbia	48 (0.8)	526 (3.6)	52 (0.8)	523 (4.9)	3 (4.6)		
<sup>1,2</sup> † Canada	49 (0.5)	526 (2.8)	51 (0.5)	524 (3.0)	2 (2.2)		
† Belgium (Flemish)	50 (0.9)	512 (2.6)	50 (0.9)	511 (2.6)	2 (2.4)		
Poland	50 (0.8)	548 (2.5)	50 (0.8)	546 (3.0)	1 (2.8)		
Turkey	49 (0.6)	484 (3.3)	51 (0.6)	483 (4.0)	1 (3.1)		
† Netherlands	50 (0.9)	517 (2.8)	50 (0.9)	517 (3.0)	1 (2.4)		
Australia	49 (1.0)	524 (3.3)	51 (1.0)	523 (3.4)	1 (3.4)		
England	51 (0.7)	536 (3.0)	49 (0.7)	536 (2.6)	1 (2.8)		
Norway (5)	49 (0.9)	538 (3.1)	51 (0.9)	537 (3.1)	1 (3.2)		
<sup>2</sup> Singapore	48 (0.5)	591 (3.7)	52 (0.5)	590 (4.2)	0 (2.8)		
Russian Federation	49 (0.9)	567 (3.1)	51 (0.9)	567 (3.7)	0 (2.7)		
France	49 (0.7)	487 (3.1)	51 (0.7)	487 (2.9)	0 (2.4)		
‡ Northern Ireland	50 (1.1)	520 (3.0)	50 (1.1)	520 (2.8)	0 (3.7)		
Cyprus	49 (0.7)	481 (2.8)	51 (0.7)	481 (2.9)	0 (2.6)		
Chile	49 (1.7)	477 (3.0)	51 (1.7)	478 (3.4)	1 (3.3)		
Germany	48 (0.7)	527 (2.7)	52 (0.7)	529 (2.6)	2 (2.3)		
Croatia	49 (0.8)	532 (2.7)	51 (0.8)	534 (2.2)	2 (2.8)		
<sup>2</sup> † United States	51 (0.6)	544 (2.4)	49 (0.6)	548 (2.5)	4 (2.0)		
<sup>2</sup> † Denmark	49 (0.8)	525 (2.5)	51 (0.8)	529 (2.6)	4 (2.8)		
Japan	50 (0.5)	567 (2.0)	50 (0.5)	571 (2.3)	4 (2.4)		
Ireland, Rep. of	47 (1.5)	526 (2.9)	53 (1.5)	531 (2.9)	5 (3.4)		
<sup>2</sup> Spain	49 (0.9)	515 (2.9)	51 (0.9)	521 (2.9)	6 (2.7)		
Slovenia	49 (0.8)	539 (2.4)	51 (0.8)	546 (3.1)	7 (2.7)		
<sup>2</sup> Portugal	49 (0.8)	504 (2.5)	51 (0.8)	512 (2.4)	7 (2.2)		
Hungary	49 (0.9)	538 (3.5)	51 (0.9)	546 (3.9)	8 (3.1)		
Czech Republic	49 (0.9)	530 (2.8)	51 (0.9)	538 (2.7)	8 (2.6)		
Slovak Republic	48 (0.9)	516 (3.2)	52 (0.9)	524 (2.7)	8 (2.7)		
Chinese Taipei	49 (0.6)	551 (2.2)	51 (0.6)	560 (2.4)	9 (2.9)		
<sup>2</sup> Italy	49 (0.7)	512 (3.1)	51 (0.7)	521 (2.8)	9 (2.5)		
† Hong Kong SAR	46 (1.5)	551 (3.9)	54 (1.5)	561 (3.3)	10 (3.9)		
Korea, Rep. of	48 (0.5)	584 (2.3)	52 (0.5)	595 (2.3)	11 (2.4)		
International Avg.	49 (0.1)	508 (0.5)	51 (0.1)	504 (0.6)			



<sup>ψ</sup> Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.  
 See Appendix C.1 for target population coverage notes 1, 2, and 3. See Appendix C.7 for sampling guidelines and sampling participation notes †, ‡, and †.  
 ( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Source: Exhibit 1.10, International science report (Martin *et al.*, 2016a).

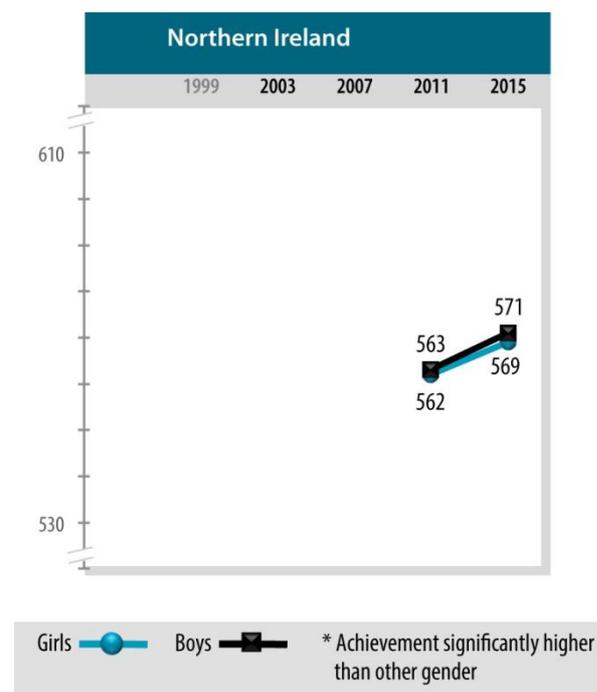
## 2.1.1 Gender differences in mathematics attainment

Northern Ireland is near the middle of Table 2.1, with no significant gender difference in mathematics attainment in Y6. Boys in Northern Ireland scored an average of 571 for mathematics and girls an average of 569.

Of the 50<sup>12</sup> participating countries, just over half (26 countries) had a significant gender difference. In eight countries this gender difference favoured girls, while in the remaining 18 countries it favoured boys. Northern Ireland was one of 23 countries showing no overall gender difference for mathematics attainment at this age, including Poland, the Republic of Ireland and the high performers of Japan and Singapore. In contrast, England, Australia and the high performers of Hong Kong, Korea and Chinese Taipei all had significant gender differences for mathematics attainment, favouring boys; in contrast, Finland had a significant gender difference favouring girls.

There has been no change in the gender difference in Y6 maths attainment in Northern Ireland since 2011, as shown in Figure 2.1 below. Consistent with the 2011 results, in 2015 there was no statistically significant difference in the mathematics score for boys (571) and the score for girls (569).

**Figure 2.1 Trends in mathematics achievement by gender**



Source: Exhibit 1.12, International mathematics report (Mullis *et al.*, 2016a).

<sup>12</sup> Armenia administered the Grade 4 assessment but no data is available, therefore data from 49 countries is available for comparison.

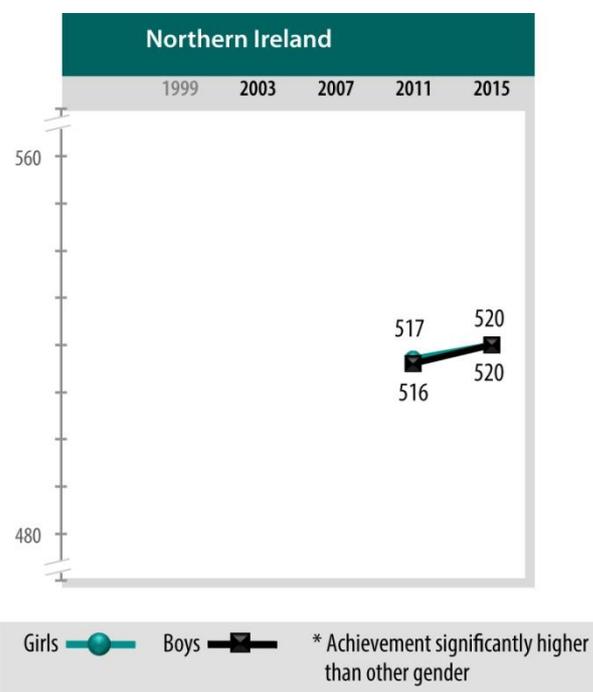
## 2.1.2 Gender differences in science attainment

Northern Ireland also has no significant gender difference in science attainment in Y6 (see Table 2.2). The average scale score for both boys and girls in science was 520. Just under half of the participating countries (22 of 47) showed a significant gender difference for science. Unlike mathematics, where more countries had a significant gender difference favouring boys, in science the number of countries with a gender difference favouring boys and the number of countries with a gender difference favouring girls was the same (11 in each case).

Northern Ireland was one of 25 countries showing no significant overall gender difference for science at this age. The other countries included Australia, the Republic of Ireland, England, Poland and the highest scorer Singapore. By contrast, the high performers of Hong Kong, Korea and Chinese Taipei all had a gender difference for science attainment in favour of boys, just as they had for mathematics. As was the case for mathematics, Finland has a gender difference for science attainment in favour of girls.

As shown in Figure 2.2, there has been no change in the gender difference in science attainment in Northern Ireland between 2011 and 2015. In both 2011 and 2015 there were no statistically significant differences in the science scores for girls and boys in Northern Ireland. In 2011, the girls' score of 517 compared with a score of 516 for boys; in 2015 the score for both boys and girls was 520.

**Figure 2.2 Trends in science achievement by gender**



Source: Exhibit 1.12, International science report (Martin *et al.*, 2016a).

## 2.2 Conclusion

Northern Ireland's high attainment in mathematics at ages 9-10 is achieved through equally high performance from girls and boys and, although overall performance in science is weaker, once again both girls and boys contribute equally to that attainment.

In addition, this equality of attainment in mathematics and science between boys and girls first seen in TIMSS 2011 has remained in TIMSS 2015.