Chapter 3 Attainment by gender and language context

Chapter outline

This chapter summarises pupils' attainment by gender, in mathematics and science in Year 5 (Y5, ages 9 –10) and Year 9 (Y9, ages 13 –14) in 2011 and over time. Findings for mathematics are presented first, followed by findings for science. Outcomes for England are compared with international outcomes. Contextual information about the frequency with which pupils speak English (the language in which the TIMSS test is administered) is also outlined.

Key findings

- In England, there were no significant[23] gender differences for either subject (mathematics and science) at either grade (Y5 and Y9).
- Gender differences in science at Y9 persisted up to TIMSS 2003 but have since been eradicated. No significant gender difference existed at any point for Y5 science.
- There have been no gender differences in mathematics for either age group in England in the three most recent TIMSS cycles.
- Fewer pupils than in 2007 speak English as their first language.
- The more frequently that pupils reported speaking English at home, the better they appeared to do at mathematics and science in Y5 and at science in Y9.

3.1 Mathematics attainment by gender: Year 5

The TIMSS 2011 mathematics score for Year 5 (Y5) pupils in England was 542, above the centre point of the international scale. The scale score for girls was 541 and for boys, 544. This small difference was not significant. Table 3.1 overleaf shows the international rankings for gender difference. Of the 50 participating countries and seven benchmarking participants, just over half have a gender difference, mostly in favour of boys, but favouring girls in some countries. England is one of 27 participants (26 countries and one benchmarking participant) showing no overall gender difference for mathematics at this age.

23 Throughout this report, findings listed as 'significant' are statistically significant.

Interpreting the data: England's gender differences, Y5 mathematics

The TIMSS achievement scale has a centre point of 500 and a standard deviation of 100. It is scaled to remain constant from assessment to assessment, allowing comparison over time. The graphic shows the direction and size of any difference for each country. Statistically significant differences are shown in colour while non-significant differences are shown greyed out.

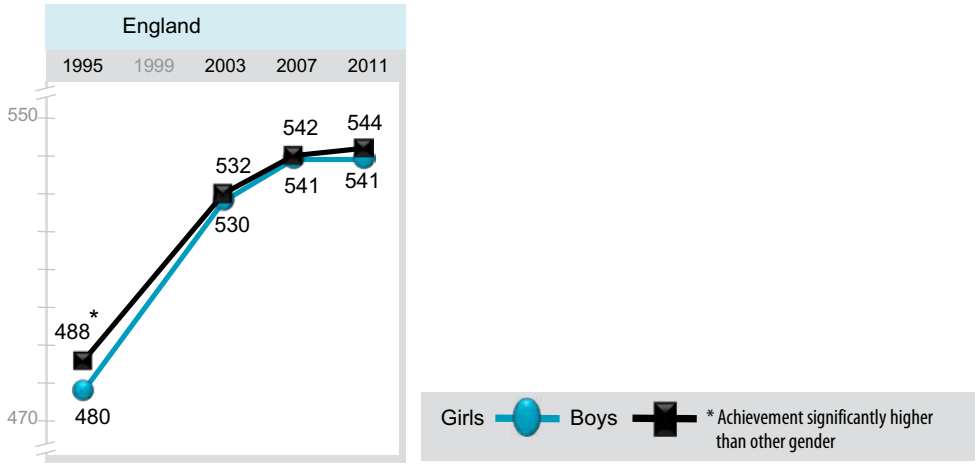
Countries participating in TIMSS follow guidelines and strict sampling targets to provide samples that are nationally representative. 'Benchmarking participants' are regional entities which follow the same guidelines and targets to provide samples that are representative at regional level.

Figure 3.1 shows the TIMSS gender trends over time for Y5 mathematics. It shows that the mathematics scores of girls and boys have mirrored each other across the four cycles of TIMSS in which pupils of this age have participated. The only significant difference seen at this grade occurred in TIMSS 1995, when boys performed eight score points higher than girls. Both genders improved their performance to a comparable level in 2003 and their levels of attainment in TIMSS have been parallel since then.

Interpreting the data: England's Y5 gender trends in mathematics

The diagram shows England's mean scale score for boys (indicated by a square) and girls (indicated by a circle) in each cycle from 1995 onwards (the 1999 cycle of TIMSS included only older pupils, not the 9 –10 year olds). Only the difference in 1995 was statistically significant.

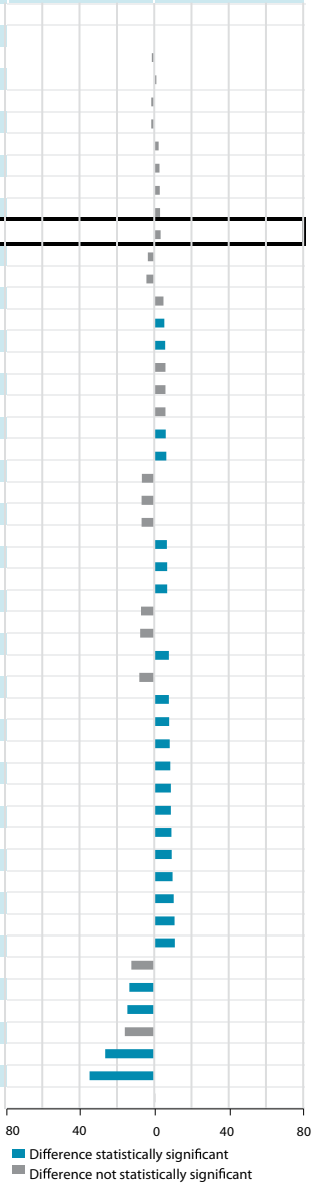
Figure 3.1: Gender trends in Y5 mathematics achievement in England



Source: Exhibit 1.12, international mathematics report

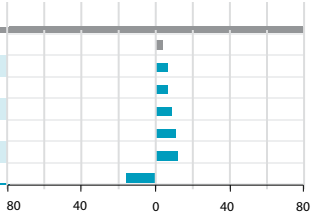
Table 3.1 TIMSS 2011 gender differences, mathematics at ages 9 –10

Country	Girls		Boys		Difference (Absolute Value)	Gender difference
	Per cent of Students	Average Scale Score	Per cent of Students	Average Scale Score		Girls scored higher / Boys scored higher
Iran, Islamic Rep. of	49 (2.9)	431 (5.2)	51 (2.9)	431 (5.4)	0 (8.0)	
New Zealand	49 (0.8)	486 (3.3)	51 (0.8)	486 (2.8)	0 (3.1)	
† Northern Ireland	49 (1.3)	562 (3.3)	51 (1.3)	563 (3.6)	0 (3.8)	
Russian Federation	49 (1.0)	543 (3.7)	51 (1.0)	542 (4.1)	1 (2.4)	
1 2 Lithuania	48 (0.8)	533 (2.6)	52 (0.8)	534 (2.9)	1 (2.6)	
Chinese Taipei	47 (0.6)	592 (2.5)	53 (0.6)	590 (2.4)	2 (2.8)	
Turkey	48 (0.6)	470 (5.2)	52 (0.6)	469 (4.8)	2 (3.8)	
Hungary	49 (1.0)	514 (3.6)	51 (1.0)	517 (3.9)	2 (3.2)	
Romania	48 (0.9)	481 (6.7)	52 (0.9)	484 (5.9)	3 (4.5)	
Japan	49 (0.5)	584 (2.0)	51 (0.5)	587 (2.5)	3 (3.0)	
England	48 (1.0)	541 (4.2)	52 (1.0)	544 (3.5)	3 (3.4)	
Ireland, Rep. of	49 (2.3)	526 (3.7)	51 (2.3)	529 (3.3)	3 (4.6)	
Armenia	47 (0.8)	454 (4.1)	53 (0.8)	451 (3.6)	3 (3.0)	
2 Singapore	49 (0.6)	608 (3.6)	51 (0.6)	604 (3.5)	4 (3.0)	
Sweden	49 (1.0)	501 (2.5)	51 (1.0)	506 (2.4)	5 (2.7)	
2 Kazakhstan	48 (0.8)	498 (4.4)	52 (0.8)	504 (4.8)	5 (2.6)	
2 Denmark	51 (0.7)	534 (2.9)	49 (0.7)	540 (2.9)	6 (2.8)	
Australia	49 (1.0)	513 (3.3)	51 (1.0)	519 (3.6)	6 (3.8)	
Portugal	49 (1.1)	529 (4.1)	51 (1.1)	535 (3.4)	6 (3.2)	
2 Serbia	48 (0.9)	513 (3.8)	52 (0.9)	519 (3.5)	6 (4.1)	
2 Hong Kong SAR	46 (1.2)	598 (3.2)	54 (1.2)	604 (3.9)	6 (2.3)	
Korea, Rep. of	48 (0.4)	601 (2.1)	52 (0.4)	608 (2.2)	7 (2.0)	
2 Azerbaijan	47 (0.8)	466 (6.4)	53 (0.8)	460 (5.9)	7 (3.9)	
⁂ Morocco	48 (0.8)	338 (4.6)	52 (0.8)	331 (4.3)	7 (3.9)	
Ψ Tunisia	47 (0.8)	363 (4.5)	53 (0.8)	356 (4.4)	7 (4.4)	
Malta	49 (0.5)	492 (1.6)	51 (0.5)	499 (2.1)	7 (2.5)	
‡ Norway	51 (1.1)	492 (2.8)	49 (1.1)	499 (3.5)	7 (2.8)	
Finland	49 (0.8)	542 (2.5)	51 (0.8)	549 (2.9)	7 (2.8)	
1 Georgia	48 (0.9)	454 (3.2)	52 (0.9)	447 (4.9)	7 (3.9)	
Bahrain	50 (1.6)	440 (4.5)	50 (1.6)	432 (4.0)	7 (5.5)	
† Netherlands	52 (1.0)	536 (2.1)	48 (1.0)	544 (2.1)	8 (2.4)	
United Arab Emirates	50 (1.6)	438 (2.8)	50 (1.6)	430 (3.5)	8 (5.0)	
Belgium (Flemish)	50 (0.9)	545 (2.2)	50 (0.9)	553 (2.4)	8 (2.5)	
Slovak Republic	49 (0.9)	503 (4.0)	51 (0.9)	511 (3.9)	8 (2.6)	
Germany	49 (0.8)	523 (2.7)	51 (0.8)	532 (2.6)	8 (2.7)	
2 United States	51 (0.5)	536 (2.1)	49 (0.5)	545 (1.9)	9 (1.7)	
Italy	50 (0.7)	503 (3.1)	50 (0.7)	512 (2.9)	9 (3.0)	
Poland	48 (0.9)	476 (2.4)	52 (0.9)	486 (2.5)	9 (2.5)	
Austria	49 (1.2)	504 (2.7)	51 (1.2)	513 (3.3)	9 (2.8)	
Chile	51 (1.4)	457 (2.7)	49 (1.4)	466 (2.8)	9 (3.3)	
Slovenia	48 (0.8)	508 (2.2)	52 (0.8)	518 (3.1)	10 (3.2)	
2 Croatia	50 (0.8)	485 (2.4)	50 (0.8)	495 (2.4)	10 (2.8)	
Czech Republic	48 (1.2)	505 (2.8)	52 (1.2)	516 (2.7)	11 (2.7)	
Spain	49 (0.8)	477 (3.1)	51 (0.8)	488 (3.4)	11 (3.0)	
⁂ Yemen	40 (2.8)	255 (7.0)	60 (2.8)	243 (7.0)	12 (7.6)	
2 Qatar	47 (3.4)	420 (4.7)	53 (3.4)	407 (4.2)	13 (5.6)	
Thailand	49 (0.9)	465 (4.8)	51 (0.9)	451 (5.6)	14 (4.4)	
Saudi Arabia	52 (1.5)	418 (4.6)	48 (1.5)	402 (10.0)	16 (11.2)	
Ψ Oman	49 (0.7)	398 (3.2)	51 (0.7)	372 (3.4)	26 (3.3)	
1 ⁂ Kuwait	54 (1.6)	358 (3.6)	46 (1.6)	323 (5.8)	35 (6.8)	
International Avg.	49 (0.2)	490 (0.5)	51 (0.2)	491 (0.6)		



⁂ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.
Ψ Reservations about reliability of average achievement because the percentage of students with achievement too low for estimation does not exceed 25% but exceeds 15%.
See Appendix C.2 in the international report for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes † and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Benchmarking participants					
Dubai, UAE	47 (2.4)	466 (3.5)	53 (2.4)	470 (3.9)	4 (6.7)
Ontario, Canada	49 (0.8)	515 (3.3)	51 (0.8)	521 (3.4)	6 (2.6)
1 3 Florida, US	51 (0.8)	542 (2.8)	49 (0.8)	549 (3.9)	7 (3.3)
2 Alberta, Canada	48 (0.9)	502 (3.1)	52 (0.9)	511 (2.7)	9 (3.1)
Quebec, Canada	50 (1.0)	527 (2.8)	50 (1.0)	538 (2.7)	11 (2.6)
1 2 North Carolina, US	51 (1.3)	548 (4.0)	49 (1.3)	560 (4.9)	12 (3.2)
Abu Dhabi, UAE	50 (2.9)	425 (5.0)	50 (2.9)	409 (6.7)	16 (7.9)



Source: Exhibit 1.10, international mathematics report

3.2 Mathematics attainment by gender: Year 9

The TIMSS 2011 mathematics score for Year 9 (Y9) pupils in England was 507 overall, not significantly different from the centre point of the international scale (500). The average scale score for girls was 508 and for boys 505. This small difference was not statistically significant. Table 3.2 shows the international rankings for gender difference. Of the 56 participants, 21 showed gender differences. Unlike the younger age group, these tended to favour girls (13 of the 21 participants). England is one of 35 participants showing no overall gender difference for mathematics at this age.

Interpreting the data: England's gender differences, Y9 mathematics

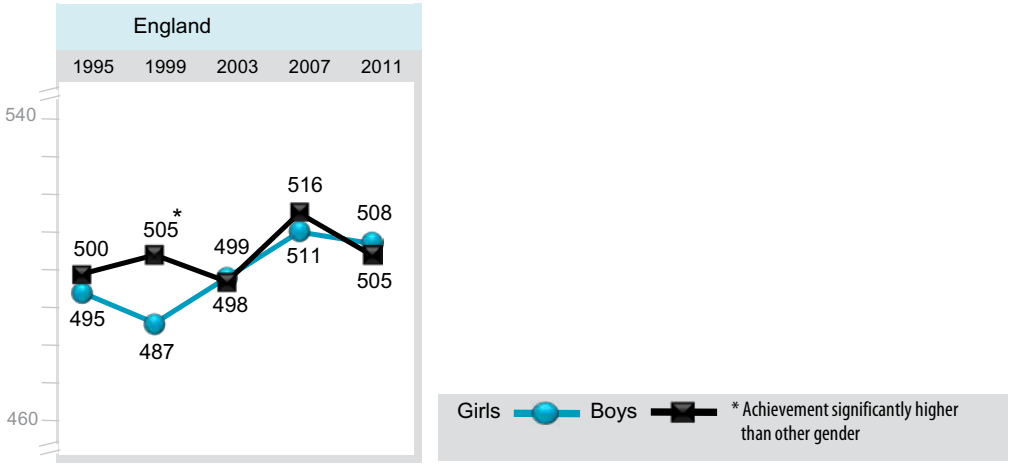
See section 3.1 for a summary of how to interpret this table.

Figure 3.2 shows the TIMSS gender trends over time for Y9 mathematics. It shows that the scores of girls and boys have mirrored each other across four of the five cycles of TIMSS in which pupils of this age have participated. The only significant difference at this grade occurred in TIMSS 1999, when boys performed 18 score points higher than girls. This was the same cohort of pupils which had previously formed the TIMSS 1995 Y5 sample, which also showed a gender difference. Following that difference, both groups came back into alignment in 2003 and the performance of both improved in 2007, remaining stable (not significantly different) in 2011.

Interpreting the data: England's Y9 gender trends in mathematics

The diagram shows England's mean scale score for boys (indicated by a square) and girls (indicated by a circle) in each cycle from 1995 onwards. Only the difference in 1999 was statistically significant.

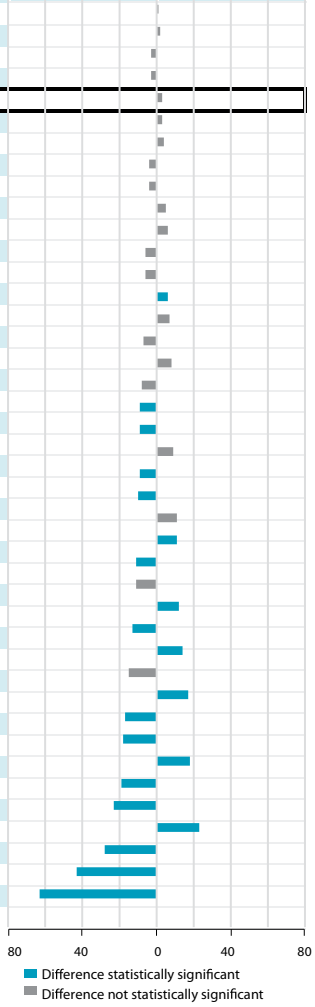
Figure 3.2: Gender trends in Y9 mathematics achievement in England



Source: Exhibit 1.13, international mathematics report

Table 3.2 TIMSS 2011 gender differences, mathematics at ages 13 –14

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
⁂ Morocco	47 (0.8)	371 (2.3)	53 (0.8)	371 (2.7)	0 (3.2)		
[2] Russian Federation	49 (0.9)	539 (3.8)	51 (0.9)	539 (3.9)	1 (2.9)		
Kazakhstan	49 (0.8)	486 (4.1)	51 (0.8)	488 (4.5)	2 (3.3)		
Norway	49 (0.7)	476 (2.9)	51 (0.7)	473 (2.9)	3 (3.1)		
‡ England	48 (2.0)	508 (5.7)	52 (2.0)	505 (6.6)	3 (5.6)		
[1] Georgia	47 (0.9)	430 (4.1)	53 (0.9)	432 (4.4)	3 (4.0)		
Ukraine	50 (1.0)	478 (4.0)	50 (1.0)	481 (4.9)	3 (4.4)		
[2] United States	51 (0.6)	508 (2.9)	49 (0.6)	511 (2.8)	4 (2.2)		
Sweden	48 (0.9)	486 (2.1)	52 (0.9)	482 (2.4)	4 (2.4)		
Finland	48 (1.1)	516 (2.7)	52 (1.1)	512 (2.7)	4 (2.3)		
Slovenia	49 (0.9)	502 (2.4)	51 (0.9)	507 (2.8)	5 (2.8)		
Hungary	49 (1.1)	502 (3.9)	51 (1.1)	508 (3.9)	6 (3.5)		
Hong Kong SAR	49 (1.6)	588 (5.0)	51 (1.6)	583 (4.3)	6 (5.5)		
Chinese Taipei	48 (1.0)	613 (3.7)	52 (1.0)	606 (3.8)	6 (4.1)		
Korea, Rep. of	52 (2.5)	610 (3.5)	48 (2.5)	616 (3.1)	6 (3.1)		
Ψ Iran, Islamic Rep. of	46 (2.3)	411 (5.9)	54 (2.3)	418 (5.9)	7 (8.1)		
Ψ Macedonia, Rep. of	49 (0.9)	430 (5.8)	51 (0.9)	423 (5.6)	7 (4.7)		
Japan	49 (1.1)	566 (3.1)	51 (1.1)	574 (3.5)	8 (4.1)		
[3] Israel	50 (1.6)	520 (3.9)	50 (1.6)	512 (5.2)	8 (4.4)		
[2] Singapore	49 (0.7)	615 (3.7)	51 (0.7)	607 (4.5)	9 (3.5)		
Turkey	49 (0.7)	457 (3.8)	51 (0.7)	448 (4.7)	9 (3.5)		
Australia	50 (1.6)	500 (4.7)	50 (1.6)	509 (7.3)	9 (6.9)		
[1] Lithuania	49 (0.7)	507 (2.6)	51 (0.7)	498 (3.2)	9 (3.0)		
Armenia	49 (0.8)	472 (3.1)	51 (0.8)	462 (3.2)	10 (3.1)		
Ψ Syrian Arab Republic	50 (1.7)	375 (5.3)	50 (1.7)	385 (5.3)	11 (5.7)		
Italy	49 (0.9)	493 (2.9)	51 (0.9)	504 (2.8)	11 (2.9)		
Romania	48 (0.9)	464 (4.6)	52 (0.9)	453 (4.2)	11 (3.6)		
Ψ Qatar	50 (3.3)	415 (5.8)	50 (3.3)	404 (5.5)	11 (9.5)		
Lebanon	55 (1.9)	444 (4.2)	45 (1.9)	456 (4.7)	12 (4.7)		
Ψ Indonesia	50 (1.2)	392 (4.9)	50 (1.2)	379 (4.5)	13 (4.0)		
Chile	53 (1.5)	409 (3.2)	47 (1.5)	424 (3.0)	14 (3.6)		
Ψ Saudi Arabia	48 (1.2)	401 (4.1)	52 (1.2)	387 (8.0)	15 (8.9)		
Tunisia	52 (0.7)	417 (3.1)	48 (0.7)	433 (3.1)	17 (2.5)		
United Arab Emirates	50 (1.7)	464 (2.7)	50 (1.7)	447 (3.1)	17 (4.2)		
Thailand	55 (1.6)	435 (4.2)	45 (1.6)	417 (5.3)	18 (4.4)		
New Zealand	47 (2.0)	478 (5.5)	53 (2.0)	496 (6.2)	18 (4.7)		
Malaysia	51 (1.2)	449 (5.2)	49 (1.2)	430 (6.2)	19 (4.4)		
Ψ Palestinian Nat'l Auth.	52 (1.7)	415 (4.2)	48 (1.7)	392 (5.6)	23 (7.0)		
⁂ Ghana	47 (0.8)	318 (4.8)	53 (0.8)	342 (4.3)	23 (2.9)		
Ψ Jordan	49 (1.7)	420 (4.3)	51 (1.7)	392 (5.9)	28 (7.4)		
Ψ Bahrain	50 (0.8)	431 (2.5)	50 (0.8)	388 (3.1)	43 (4.0)		
Ψ Oman	51 (2.1)	397 (3.1)	49 (2.1)	334 (3.8)	63 (4.6)		
International Avg.	50 (0.2)	469 (0.6)	50 (0.2)	465 (0.7)			



⁂ Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.

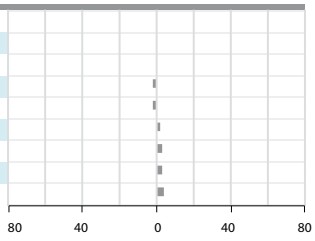
Ψ Reservations about reliability of average achievement because the percentage of students with achievement too low for estimation does not exceed 25% but exceeds 15%.

See Appendix C.3 in the international report for target population coverage notes 1, 2, and 3. See Appendix C.9 for sampling guidelines and sampling participation notes † and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Benchmarking Participants

[2] Ontario, Canada	49 (0.9)	512 (2.7)	51 (0.9)	512 (3.1)	0 (3.1)
Quebec, Canada	51 (1.4)	531 (2.9)	49 (1.4)	532 (2.5)	0 (2.7)
[1] Minnesota, US	52 (1.5)	545 (4.9)	48 (1.5)	545 (5.1)	0 (3.9)
[1] Alabama, US	51 (1.6)	467 (6.3)	49 (1.6)	465 (6.2)	2 (3.9)
Abu Dhabi, UAE	47 (2.7)	450 (3.9)	53 (2.7)	448 (5.7)	2 (6.4)
[2] Alberta, Canada	50 (0.9)	504 (3.3)	50 (0.9)	506 (2.7)	2 (3.0)
[1 3] North Carolina, US	52 (1.0)	535 (6.2)	48 (1.0)	539 (8.3)	3 (5.1)
[1 2] California, US	49 (1.1)	491 (5.6)	51 (1.1)	494 (5.0)	3 (4.1)
[1] Colorado, US	51 (1.5)	516 (5.4)	49 (1.5)	520 (5.0)	4 (3.4)



Source: Exhibit 1.11, international mathematics report

3.3 Science attainment by gender: Year 5

The TIMSS 2011 science score for Year 5 (Y5) pupils in England was 529, above the centre point of the international scale. The scale score for girls was 529 and for boys, 528. This very small difference was not significant. Table 3.3 shows the international rankings for gender difference. Of the 57 participants at this age range, 32 showed gender differences. As was the case for mathematics, boys generally performed better than girls: although the reverse applied for 12 participants. England is one of 25 participants showing no overall gender difference for science at this age.

Interpreting the data: England's gender differences, Y5 science

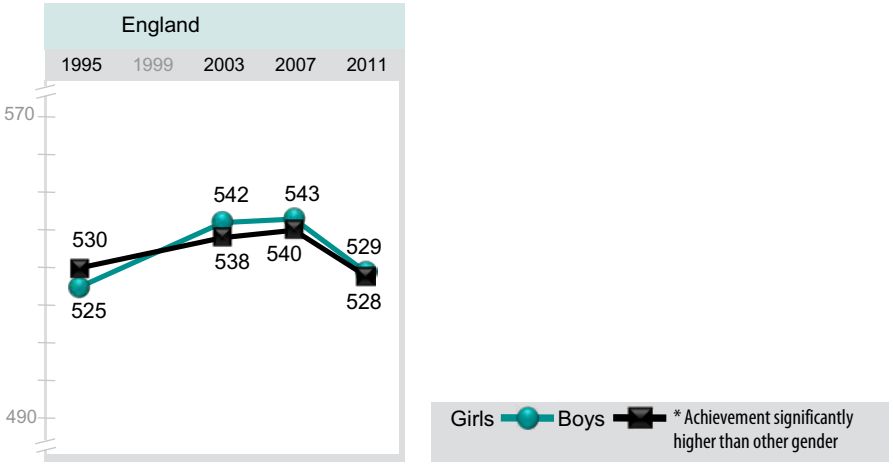
See section 3.1 for a summary of how to interpret this table.

Figure 3.3 shows the TIMSS gender trends over time for Y5 science. It shows that the scores of girls and boys have mirrored each other closely across the four cycles of TIMSS in which pupils of this age have participated. There have been no significant differences in any of the TIMSS years for Y5 science.

Interpreting the data: England's Y5 gender trends in science

The diagram shows England's mean scale score for boys (indicated by a square) and girls (indicated by a circle) in each cycle from 1995 onwards (the 1999 cycle of TIMSS included only older pupils, not the 9 –10 year olds). None of the differences are statistically significant.

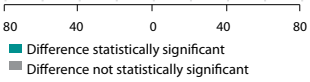
Figure 3.3: Gender trends in Y5 science achievement in England



Source: Exhibit 1.12, international science report

Table 3.3 TIMSS 2011 gender differences, science at ages 9 –10

Country	Girls		Boys		Difference (Absolute Value)	Gender Difference	
	Per cent of Students	Average Scale Score	Per cent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
Australia	49 (1.0)	516 (3.1)	51 (1.0)	516 (3.7)	0 (3.9)		
Romania	48 (0.9)	505 (6.9)	52 (0.9)	506 (5.7)	0 (4.7)		
Finland	49 (0.8)	570 (2.9)	51 (0.8)	570 (3.0)	0 (3.0)		
Ireland	49 (2.3)	516 (4.0)	51 (2.3)	516 (4.6)	1 (5.5)		
New Zealand	49 (0.8)	496 (3.0)	51 (0.8)	497 (2.6)	1 (3.2)		
England	48 (1.0)	529 (3.3)	52 (1.0)	528 (3.3)	1 (3.1)		
1 2 Lithuania	48 (0.8)	514 (2.4)	52 (0.8)	515 (3.0)	1 (2.6)		
Russian Federation	49 (1.0)	553 (3.5)	51 (1.0)	552 (3.8)	1 (2.4)		
† Northern Ireland	49 (1.3)	517 (3.2)	51 (1.3)	516 (3.2)	1 (3.8)		
2 Denmark	51 (0.7)	527 (3.3)	49 (0.7)	529 (3.1)	2 (3.0)		
Iran, Islamic Rep. of	49 (2.9)	452 (5.8)	51 (2.9)	454 (5.7)	2 (8.8)		
2 Serbia	48 (0.9)	514 (3.6)	52 (0.9)	517 (3.7)	3 (3.9)		
Sweden	49 (1.0)	532 (3.0)	51 (1.0)	535 (3.2)	4 (3.0)		
‡ Norway	51 (1.1)	492 (2.5)	49 (1.1)	496 (3.2)	4 (3.1)		
2 Singapore	49 (0.6)	581 (3.7)	51 (0.6)	585 (3.7)	4 (2.7)		
Turkey	48 (0.6)	465 (5.0)	52 (0.6)	461 (4.7)	4 (3.8)		
Hungary	49 (1.0)	532 (4.0)	51 (1.0)	537 (3.9)	5 (2.9)		
2 Croatia	50 (0.8)	514 (2.5)	50 (0.8)	518 (2.5)	5 (2.7)		
Portugal	49 (1.1)	519 (4.6)	51 (1.1)	524 (3.8)	5 (3.2)		
Armenia	47 (0.8)	419 (4.0)	53 (0.8)	414 (4.3)	5 (3.4)		
Japan	49 (0.5)	556 (2.7)	51 (0.5)	561 (2.1)	5 (2.8)		
Slovenia	48 (0.8)	517 (2.8)	52 (0.8)	523 (3.4)	6 (3.2)		
2 Hong Kong SAR	46 (1.2)	532 (3.6)	54 (1.2)	538 (4.3)	6 (2.5)		
Poland	48 (0.9)	502 (3.0)	52 (0.9)	508 (2.9)	6 (2.8)		
Malta	49 (0.5)	443 (2.2)	51 (0.5)	449 (2.8)	6 (3.3)		
Chinese Taipei	47 (0.6)	548 (2.6)	53 (0.6)	555 (2.4)	7 (2.3)		
Italy	50 (0.7)	520 (3.2)	50 (0.7)	528 (3.0)	7 (2.9)		
Korea, Rep. of	48 (0.4)	583 (2.4)	52 (0.4)	590 (2.3)	8 (2.3)		
2 Kazakhstan	48 (0.8)	490 (5.1)	52 (0.8)	498 (5.5)	8 (3.0)		
2 Azerbaijan	47 (0.8)	442 (6.3)	53 (0.8)	434 (5.7)	8 (4.0)		
Slovak Republic	49 (0.9)	528 (4.3)	51 (0.9)	536 (3.6)	8 (2.7)		
1 Georgia	48 (0.9)	459 (3.2)	52 (0.9)	451 (5.1)	9 (3.9)		
Ж Morocco	48 (0.8)	268 (5.1)	52 (0.8)	259 (4.9)	9 (4.4)		
Spain	49 (0.8)	500 (2.8)	51 (0.8)	510 (3.7)	10 (2.8)		
Thailand	49 (0.9)	476 (5.7)	51 (0.9)	467 (6.6)	10 (5.0)		
2 United States	51 (0.5)	539 (2.3)	49 (0.5)	549 (2.1)	10 (1.5)		
† Netherlands	52 (1.0)	526 (2.4)	48 (1.0)	537 (2.6)	10 (2.1)		
Belgium (Flemish)	50 (0.9)	503 (2.6)	50 (0.9)	514 (2.3)	11 (2.9)		
Chile	51 (1.4)	474 (2.8)	49 (1.4)	486 (2.8)	12 (2.9)		
Germany	49 (0.8)	522 (3.0)	51 (0.8)	534 (3.2)	12 (2.5)		
Austria	49 (1.2)	525 (2.8)	51 (1.2)	538 (3.6)	12 (2.9)		
Czech Republic	48 (1.2)	529 (2.9)	52 (1.2)	544 (2.7)	15 (2.6)		
United Arab Emirates	50 (1.6)	437 (3.4)	50 (1.6)	419 (3.8)	18 (5.3)		
Bahrain	50 (1.6)	461 (5.5)	50 (1.6)	438 (4.6)	23 (7.0)		
Ψ Tunisia	47 (0.8)	359 (5.6)	53 (0.8)	334 (5.6)	25 (4.3)		
2 Qatar	47 (3.4)	408 (5.1)	53 (3.4)	382 (5.7)	26 (6.5)		
Ж Yemen	40 (2.8)	225 (7.3)	60 (2.8)	198 (8.8)	27 (8.0)		
Oman	49 (0.7)	394 (4.7)	51 (0.7)	360 (4.6)	34 (3.8)		
Saudi Arabia	52 (1.5)	453 (4.7)	48 (1.5)	405 (9.9)	48 (11.0)		
1 Ψ Kuwait	54 (1.6)	371 (5.5)	46 (1.6)	319 (7.1)	53 (8.6)		
International Avg.	49 (0.2)	487 (0.6)	51 (0.2)	485 (0.6)			



Ж Average achievement not reliably measured because the percentage of students with achievement too low for estimation exceeds 25%.
Ψ Reservations about reliability of average achievement because the percentage of students with achievement too low for estimation does not exceed 25% but exceeds 15%.
See Appendix C.2 in the international report for target population coverage notes 1, 2, and 3. See Appendix C.8 for sampling guidelines and sampling participation notes † and ‡.
( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

England	48 (1.0)	529 (3.3)	52 (1.0)	528 (3.3)	1 (3.1)	
1 2 Lithuania	48 (0.8)	514 (2.4)	52 (0.8)	515 (3.0)	1 (2.6)	
Russian Federation	49 (1.0)	553 (3.5)	51 (1.0)	552 (3.8)	1 (2.4)	
† Northern Ireland	49 (1.3)	517 (3.2)	51 (1.3)	516 (3.2)	1 (3.8)	
2 Denmark	51 (0.7)	527 (3.3)	49 (0.7)	529 (3.1)	2 (3.0)	
Iran, Islamic Rep. of	49 (2.9)	452 (5.8)	51 (2.9)	454 (5.7)	2 (8.8)	
2 Serbia	48 (0.9)	514 (3.6)	52 (0.9)	517 (3.7)	3 (3.9)	
Sweden	49 (1.0)	532 (3.0)	51 (1.0)	535 (3.2)	4 (3.0)	
‡ Norway	51 (1.1)	492 (2.5)	49 (1.1)	496 (3.2)	4 (3.1)	
2 Singapore	49 (0.6)	581 (3.7)	51 (0.6)	585 (3.7)	4 (2.7)	

Source: Exhibit 1.10, international science report

3.4 Science attainment by gender: Year 9

The TIMSS 2011 science score for Year 9 (Y9) pupils in England was 533, above the centre point of the international scale. The scale score for girls was 534 and for boys, 532. This small difference was not significant. Table 3.4 shows the international rankings for gender difference. Of the 56 participants at this age range, 33 showed gender differences, about half favouring girls and half boys. England is one of 23 participants showing no overall gender difference for science at this age.

Interpreting the data: England's gender differences, Y9 science

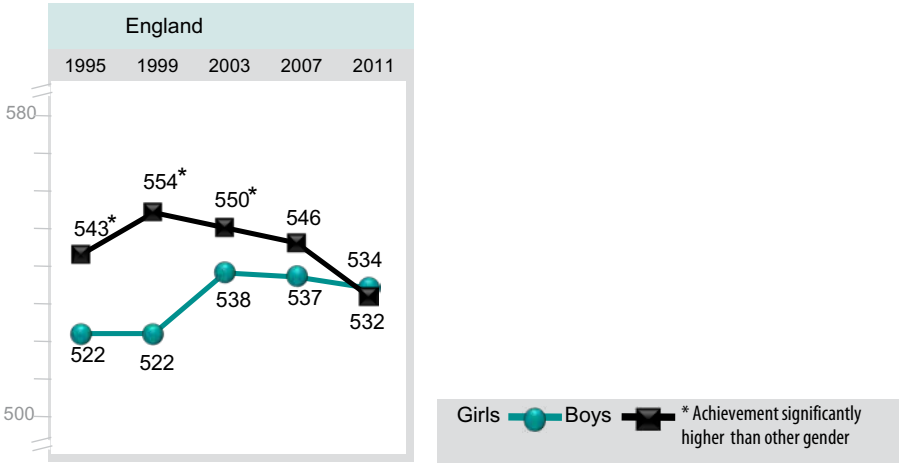
See section 3.1 for a summary of how to interpret this table.

Figure 3.4 shows the TIMSS gender trends over time for Y9 science. It shows that the scores of girls and boys were initially relatively far apart but have gradually come into alignment. Boys scored significantly more highly than girls in 1995, 1999 and 2003. In 2007, a small difference in scores persisted but this was not statistically significant. The scores have aligned in 2011 to a two-point difference only, which is not significant. The alignment has been achieved through the scores of boys dropping over time and those of girls increasing over time. As noted in chapter 1, the overall scale scores (combined scores of boys and girls) have not differed significantly for Y9 science over time across any of the TIMSS cycles.

Interpreting the data: England's Y9 gender trends in science

The diagram shows England's mean scale score for boys (indicated by a square) and girls (indicated by a circle) in each cycle from 1995 onwards. Differences up to 2003 were significant. Those in 2007 and 2011 were not significant.

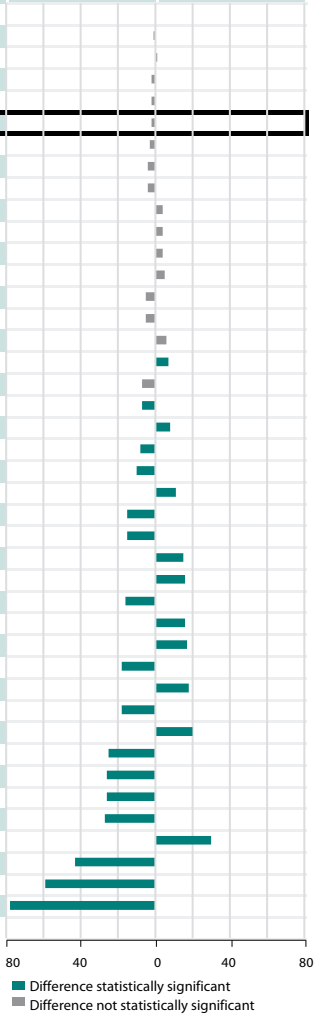
Figure 3.4: Gender trends in Y9 science achievement in England



Source: Exhibit 1.13, international science report

Table 3.4 TIMSS 2011 gender differences, science at ages 13 –14

Country	Girls		Boys		Difference (Absolute Value)	Gender Difference	
	Per cent of Students	Average Scale Score	Per cent of Students	Average Scale Score		Girls Scored Higher	Boys Scored Higher
Chinese Taipei	48 (1.0)	564 (2.7)	52 (1.0)	564 (2.8)	0 (3.0)		
Norway	49 (0.7)	495 (3.2)	51 (0.7)	494 (3.0)	1 (3.4)		
[2] Singapore	49 (0.7)	589 (4.2)	51 (0.7)	591 (5.3)	1 (4.1)		
Hong Kong SAR	49 (1.6)	536 (4.5)	51 (1.6)	534 (3.7)	2 (4.6)		
Romania	48 (0.9)	466 (3.8)	52 (0.9)	464 (4.0)	2 (3.4)		
‡ England	48 (2.0)	534 (5.0)	52 (2.0)	532 (6.2)	2 (5.6)		
Sweden	48 (0.9)	511 (2.7)	52 (0.9)	508 (3.1)	3 (3.0)		
Morocco	47 (0.8)	378 (2.6)	53 (0.8)	374 (2.7)	4 (3.0)		
Kazakhstan	49 (0.8)	492 (4.6)	51 (0.8)	488 (4.6)	4 (3.6)		
Lebanon	55 (1.9)	404 (5.4)	45 (1.9)	408 (6.5)	4 (6.7)		
Slovenia	49 (0.9)	541 (3.0)	51 (0.9)	545 (3.4)	4 (3.4)		
Ukraine	50 (1.0)	499 (3.7)	50 (1.0)	503 (4.3)	4 (4.1)		
Korea, Rep. of	52 (2.5)	558 (2.6)	48 (2.5)	563 (2.4)	5 (3.1)		
Finland	48 (1.1)	555 (2.4)	52 (1.1)	550 (3.1)	5 (2.7)		
Iran, Islamic Rep. of	46 (2.3)	477 (5.3)	54 (2.3)	472 (5.3)	5 (7.0)		
Syrian Arab Republic	50 (1.7)	424 (4.4)	50 (1.7)	429 (4.9)	6 (5.2)		
[2] Russian Federation	49 (0.9)	539 (3.6)	51 (0.9)	546 (3.5)	7 (2.9)		
[3] Israel	50 (1.6)	519 (3.7)	50 (1.6)	512 (5.2)	7 (4.2)		
Indonesia	50 (1.2)	409 (5.1)	50 (1.2)	402 (4.5)	7 (3.6)		
Japan	49 (1.1)	554 (2.9)	51 (1.1)	562 (2.9)	8 (3.3)		
[1] Lithuania	49 (0.7)	518 (3.0)	51 (0.7)	510 (3.1)	8 (3.3)		
[1] Georgia	47 (0.9)	425 (3.3)	53 (0.9)	415 (3.5)	10 (3.4)		
[2] United States	51 (0.6)	519 (2.8)	49 (0.6)	530 (2.9)	11 (2.4)		
Malaysia	51 (1.2)	434 (6.3)	49 (1.2)	419 (7.3)	15 (5.5)		
Thailand	55 (1.6)	458 (3.9)	45 (1.6)	443 (5.2)	15 (4.9)		
Italy	49 (0.9)	493 (3.1)	51 (0.9)	508 (2.6)	15 (2.8)		
Chile	53 (1.5)	454 (3.2)	47 (1.5)	470 (2.9)	16 (3.6)		
Turkey	49 (0.7)	491 (3.2)	51 (0.7)	475 (4.3)	16 (3.2)		
Australia	50 (1.6)	511 (4.5)	50 (1.6)	527 (6.5)	16 (5.9)		
Tunisia	52 (0.7)	431 (2.6)	48 (0.7)	447 (2.9)	17 (2.6)		
Macedonia, Rep. of	49 (0.9)	417 (5.6)	51 (0.9)	399 (6.1)	18 (4.7)		
Hungary	49 (1.1)	513 (3.5)	51 (1.1)	531 (3.7)	18 (3.7)		
Armenia	49 (0.8)	446 (3.5)	51 (0.8)	428 (3.6)	18 (3.4)		
New Zealand	47 (2.0)	501 (4.6)	53 (2.0)	522 (5.1)	20 (3.9)		
United Arab Emirates	50 (1.7)	477 (2.9)	50 (1.7)	452 (3.3)	25 (4.2)		
Qatar	50 (3.3)	432 (7.0)	50 (3.3)	406 (5.4)	26 (10.7)		
Saudi Arabia	48 (1.2)	450 (3.5)	52 (1.2)	424 (6.4)	26 (7.2)		
Palestinian Nat'l Auth.	52 (1.7)	434 (3.8)	48 (1.7)	406 (5.4)	27 (6.8)		
Ψ Ghana	47 (0.8)	290 (5.7)	53 (0.8)	320 (5.4)	30 (4.0)		
Jordan	49 (1.7)	471 (4.3)	51 (1.7)	428 (6.4)	43 (7.6)		
Bahrain	50 (0.8)	482 (2.2)	50 (0.8)	423 (3.6)	59 (4.4)		
Oman	51 (2.1)	458 (2.9)	49 (2.1)	380 (4.4)	78 (4.9)		
International Avg.	50 (0.2)	480 (0.6)	50 (0.2)	474 (0.7)			



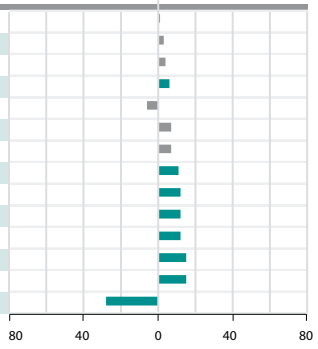
Ψ Reservations about reliability of average achievement because the percentage of students with achievement too low for estimation does not exceed 25% but exceeds 15%.

See Appendix C.3 for target population coverage notes 1, 2, and 3. See Appendix C.9 for sampling guidelines and sampling participation notes † and ‡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Benchmarking Participants

[2] Ontario, Canada	49 (0.9)	521 (2.6)	51 (0.9)	522 (3.0)	1 (2.7)
[1 2] Connecticut, US	49 (1.0)	530 (4.5)	51 (1.0)	533 (5.9)	3 (5.1)
Quebec, Canada	51 (1.4)	518 (3.0)	49 (1.4)	522 (3.0)	4 (3.0)
[2] Alberta, Canada	50 (0.9)	542 (2.8)	50 (0.9)	549 (2.5)	6 (2.5)
Abu Dhabi, UAE	47 (2.7)	465 (4.5)	53 (2.7)	458 (6.0)	6 (6.9)
[1 2] Massachusetts, US	50 (1.0)	564 (5.8)	50 (1.0)	570 (5.1)	7 (3.6)
[1] Alabama, US	51 (1.6)	482 (6.3)	49 (1.6)	489 (6.8)	7 (4.0)
[1] Colorado, US	51 (1.5)	537 (4.7)	49 (1.5)	548 (5.2)	11 (4.5)
[1 3] North Carolina, US	52 (1.0)	526 (5.7)	48 (1.0)	537 (7.7)	12 (4.7)
[1 2] California, US	49 (1.1)	493 (5.0)	51 (1.1)	504 (5.0)	12 (4.0)
[1] Minnesota, US	52 (1.5)	548 (4.9)	48 (1.5)	559 (5.3)	12 (3.8)
[1 2] Florida, US	49 (1.9)	522 (8.5)	51 (1.9)	537 (7.6)	15 (6.8)
[1 2] Indiana, US	52 (1.1)	526 (4.9)	48 (1.1)	541 (5.4)	15 (4.0)
Dubai, UAE	48 (4.6)	500 (4.6)	52 (4.6)	472 (5.8)	28 (9.3)



Source: Exhibit 1.11, international science report

3.5 The language context for TIMSS 2011 in England

In TIMSS 2011, headteachers were asked what percentage of their pupils had English as their first language.[24] Table 3.5 summarises the responses. The table shows that almost a quarter of England's Y5 pupils are taught in schools where 50 per cent or less of pupils speak English as their first language. This is more than the 15 per cent reported in this category in 2007. There has also been an increase (albeit less pronounced) at Y9.

The data shown in the international reports[25] suggest that the greater the percentage of pupils who have the language of the test as their native language, the higher the score for that group on the assessment. However, it is unlikely that these apparent associations are statistically significant.[26]

Table 3.5 Headteacher reports of size of school population with English as their first language

	Y5		Y9	
	2011	**2007**	**2011**	**2007**
Percentage of pupils in schools where more than 90% have English as their first language	56%	68%	66%	72%
Percentage of pupils in schools where 51 –90% have English as their first language	22%	17%	21%	22%
Percentage of pupils in schools where 50% or less have English as their first language	22%	15%	13%	6%

Source: Exhibits 5.5 and 5.6 international mathematics report and international science report and Exhibit 8.2 in the TIMSS 2007 international reports (Mullis et al, 2008; Martin et al, 2008)

Similar apparent trends are seen for pupils' reports of the frequency with which they speak English at home.[27] The majority of pupils reported speaking English at home *always or almost always*, particularly at Y9 (see Table 3.6). Again, there is a change since 2007, with fewer Y5 pupils reporting that they *always or almost always* speak English at home. It is noticeable that the percentages do not correspond to those in Table 3.5. This is partly because pupils for whom English is not the first language may, nevertheless, speak it with some degree of fluency, and therefore may speak it at home at times (and at school), even where it is not their first language.

24 For Y5, the wording of the question in England was: "Approximately what percentage of children in your school have English as their first language?" The Y9 question was identical apart from reference to 'students' in place of 'children'.

25 See Exhibits 5.5 and 5.6 in the international mathematics and science reports.

26 No tests of statistical significance were conducted in this international analysis but, given the size of the standard errors for the achievement scores, it is unlikely that these apparent associations are significant.

27 Pupils were asked "How often do you speak English at home?"

The more frequently that pupils reported speaking English at home, the better they appeared to do on the assessments of mathematics and science.[28] It is likely that this is true for both subjects at Y5 and for science at Y9. However, it is likely that the apparent finding for Y9 mathematics is not statistically significant.[29] Similar trends were found in TIMSS 2007 for Y5.[30]

Table 3.6 Pupil reports of frequency of speaking English at home

	Y5		Y9	
	2011	**2007**	**2011**	**2007**
Percentage of pupils always or almost always speaking English at home	81%	93%	95%	97%
Percentage of pupils sometimes speaking English at home	17%	6%	4%	2%
Percentage of pupils never speaking English at home	2%	1%	1%	0%

Source of Y9 data: Exhibit 4.6 in international mathematics and science reports

Source of Y5 data: derived from national dataset[31]

28 Derived from Exhibit 4.6 in the international mathematics and science reports, and national dataset; there was insufficient data to report average achievement for those who reported never speaking English at home.

29 No tests of statistical significance were conducted but, given the size of the standard errors for the achievement scores, it is likely that all associations are significant, except for Y9 mathematics.

30 See Exhibit 4.2 in the 2007 international mathematics and science reports (Mullis *et al*, 2008; Martin *et al*, 2008); percentages across the *sometimes* and *never* categories were too low to report achievement data for Y9 in 2007.

31 See the international database on the TIMSS 2011 page at: http://timss.bc.edu